Straw Man Burning--criticism and rebuttal to The Blind
Watchmaker

(written in late winter / early spring 1999, largely for
sake of the one who became my most beloved)

Preface

The book you hold in your hand may not be quite like
anything else you've ever read--unless, perhaps, you are
familiar with message-boarding on the Internet.

On these message-boards, writers will post letters
(sometimes rather lengthy documents) for general
consumption by the message-board population. The readers of
the message may then reply to the original writer, starting
a chain (or, more often, numerous chains) of replies,
counterreplies, and so forth.

In "olden times", we were taught to reply to letters by
incorporating the subjects discussed in previous letters
into references which were organically connected with the
paragraphs we ourselves were writing at the moment. For
some combination of reasons, this has changed on many
message-boards. Polite protocol on these boards now
requires that the respondant include a certain amount of
the previous writer's (or writers') remarks, copied and
pasted into the new letter, every time the respondant
changes topics.

Among other things, this process reduces the occurrences of
selective memory error, conflation, outright confabulation,
quoting out of context, or other examples of human-error
(intentional or otherwise!) in the response. It also allows
other message-board members, be they active participants or
observers ("posters" or "lurkers"), to check for themselves
to ensure that the respondant is making the point he or she
claims to be making--and, concurrently, allows them to
see more clearly the actual points being made by the
original writer. Of course, the process cannot be 100%
effective, and it probably represents a general decline in
compositional writing ability. Nevertheless, I find it an
excellent method for sharpening critical dialogue.

I have ported over a variant of this process into this book, to accomplish what I will call an exercise in _persistant criticism_. By criticism, I mean (for purposes of this book) mainly a check of the _systemic integrity_ of a protracted argument. By protracted argument, I mean a book-long series of inferences intended by a writer to convince a reader that a particular position or set of positions either is certainly true, or is at least good enough that the reader 'should bet on it'. (Either sort of conclusion requires, of course, that the writer of the protracted argument _also_ establish the _possibility_ of the positions being argued.) By systemic integrity, I mean that I will check for breaks in the chain(s) of reasoning employed by my subject.

A _systemic integrity check_ sounds fancy and complicated, but it really means only what you, I, and every other thinking person do every day when we judge claims made by other people to decide whether or not we should accept them as reliable claims (for purposes of potential action by us.) We do it at work, at home, at grocery stores, in banks, on farms, in churches, while reading newspapers, at school, or even listening to a (purportedly true) story being told by people we know at the local pub, bar, club, or 'greasy-spoon'. Theoretically speaking, _anybody_ may engage in a 'systemic integrity check' without being an expert in the _subject_ of discussion.

In principle, all non-fiction authors (and most fiction authors!) accept this concept; that's why we write books for the purpose of presenting our cases to you, the reader. (Note: I say 'all', but that's not necessarily true. Some writers may be purely trying to use grammar and the association of mental images in your mind, sparked by the words you read, to invoke some kind of automatic response from you. This isn't necessarily a nefarious process--you might even being going to that author precisely _for_ that effect! However, authors who do this cannot, by default, be presenting _arguments_ for you to _really_ be 'considering', no matter what it looks like they're doing. Since by definition they are not really presenting a 'case' per se to us as readers, they do not apply one way or another to my generalization.) Although most people take such actions without bothering to trace exactly _what_ they are doing, let me digress a moment to explain what an argument requires.

First, the proponent of an argument must present _data_ with which to work. This data may be fact or supposition; and of course the proponent should clearly label which is which--the difference has a bearing on the extent to which we should judge any conclusions reached by the proponent to be trustworthy. Typically, a supposition has some kind of qualifier attached to it; and for the proponent to reach a factual conclusion, this qualifier must be satisfied-- otherwise, the proponent can only at best reach a _potentially_ true conclusion. Here are two common examples of a set of facts, and a set of suppositions, expressed in mathematical form:

Fact: A=B, and B=C.
Supposition: If A=B and if B=C.

Now, let me ask you to note that by necessity 'facts' are _presumed from the outset_ to be true. Sometimes this truth can be self-evident (though self-evident truths are hard to come by.) Otherwise, this sort of truth must have been established by earlier inferences.

(Note: there is some debate about this in philosophical circles, particularly with respect to sensory data we receive. For what it's worth, my own opinion on the subject is that conscious beings habitually but not instinctually draw inferences about incoming sensory data which allows us to use this data as basic conclusions from which we may ground further arguments. For instance, sunlight scattered through the atmosphere above me at the moment falls on the photoreceptors of both my eyes and the composite eyes of the fly on my desk. This will certainly produce sensory impressions in both of us; but--presuming the fly is an unconscious entity--only one of us draws a habitually quick inference from this simple data to the conclusion "The sky looks blue today." Again, this sort of concept is still in dispute; for my present purposes, you could for the sake of convenience consider "The sky looks blue today" as an example of a 'self-evident' truth.)

Now, this introduces a rather important distinction, because a proponent (myself included) will always be extremely tempted to assert as a presumed 'fact' something which is neither a self-evident truth, nor a conclusion which has been previously settled by prior argument. Of course, the proponent may more safely use a presumption which virtually everyone considers already settled--for

example, a well-known historical incident such as "The Titanic carried fewer lifeboats than its passengers could all fit into". Or he may use a presumption which virtually everyone considers so probable that we may safely treat it as certain--for example, that the sun will rise tomorrow more-or-less in the East. Even in those cases, though, he will be exposed to a certain amount of danger; many advances in science and historical discovery have come from temporarily presuming such 'established wisdom' to be untrue and then checking to see whether this new supposition fits reality better. Usually, though, such 'established wisdom' may be safely used for arguments. However, a proponent may instead try to present as a self-evident truth, or as a firmly established position (be it either true or massively probable), a contention which still requires some serious debate. For example, a proponent may begin with "The President of the United States cannot be trusted" as a bit of settled data. Granted, in some particular cases at particular times in particular circumstances, this may in fact be settled; but usually it's not. Or, a proponent may try to present a _principle_ which is not settled and still very open to debate; for instance, the principle "Whatever can be abused had better never be used"--which directly opposes a very ancient well-respected principle which in fact most people do adhere to as sensible, "The abuse does not abolish the use." Or, worst of all, a proponent may present as a settled issue the very contention he intends to argue _to_. This is known as a 'circular' argument. Abuses of 'established wisdom' or self-evident fact status are, unfortunately, very common in philosophical and religious debates; but they are certainly not limited to that category of topic.

In an argument, the proponent arranges his data in such a way as to analyse them using logical principles. You could also say that the proponent 'filters' them through logical principles. He may simply be trying to discover anything he can about the relationship of the data with other data; or he may be trying to discover whether a particular link exists or not. This all sounds terribly abstract and complicated, but again, we do this every day. Let me take those bits of data I presented earlier and illustrate what I mean.

Data: A=B and B=C

Logical Principle: Two thing which are equal to the same
thing are equal to each other.
Question: What relation do A and C have with each other?
Answer: A must equal C.

Now, you should note that _given_ the data, a judger of
this argument need have no expert qualifications
concerning the data. So, for instance, a biologist
provides us a set of data; and then attempts to argue a
conclusion from the data. When it comes to dealing with the
data, I (for instance) as a non-expert in biology, don't
have the referent knowledge or experience to try disputing
the data--provided, of course, that the data being
presented _really is_ outside my scope of expertise. If the
data is really, say, a philosophical presumption dressed up
to _look_ like a biological fact, then if I discover this I
might be in a position to dispute the data. Normally,
though, it's something of a toss-up whether any of us are
going to be in a position to dispute (or independently
verify) the data.

What any of us _can_ do, though, is check the _links_ in
the proponent's argument; for those links are right there
in front of us, in the argument itself. Granted, that sort
of thing takes a bit of skill and practice; but potentially
anyone can analyse any given argument this way. If calling
it a 'systemic integrity check' sounds too clunky a phrase,
call it 'Doing the logical math'.

This sort of check is extremely important, because an
argument with broken logical links is an _invalid_
argument. That means that that particular argument, as it
stands, cannot reach a true conclusion. That's not the same
as saying that the conclusion reached isn't (in point of
fact) a true conclusion; only that we cannot have actually
discovered it using that particular argument. My little
cousin, Marylee, draws the following inference:

My kitten sticks her tongue out when I hug her.
Kitties kiss one another by licking each other with the tip
of their tongues.
Therefore, my kitten is trying to kiss me!

Now, it may be (in point of fact) true in any given
instance that the kitten is trying to express some kind of
affection for Marylee, and that the kitten wants to do this
by licking her. However, as a general conclusion this

inference is invalid; in this case because of an unstated
presumption treated as fact:

My kitten would **only** stick her tongue out while I hug
her if she's trying to kiss me.

But this is not a fact; it is entirely possible that the
kitten is sticking her tongue out because Marylee is
hugging the kitten very hard! By ignoring this possibility,
she may accidentally damage her kitten! This is a case
where the facts _as presented_ in the argument are not
necessarily under dispute, but there was a hidden break in
the inference which prevents the conclusion from being
trustworthy (even if it does happen to match reality--the
kitten may in fact be trying to kiss Marylee.)

It turns out that what we call 'logical principles' are
themselves a special sort of 'fact' which stand to other
bits of data like mortar to bricks in a wall. And this
leads us into some rather deep water regarding the question
of what exactly goes on in our mind when we think. That's a
very worthwhile question, with very serious implications
concerning our deductions about what reality is. But we
need not go into those issues here. The point is that
anyone with a bit of training in how concepts relate to one
another--a type of judgement we all make every day--can
check an argument to make sure it doesn't have breaks in
its links. If those breaks exist, then the proponent of
that argument (as the argument stands) cannot actually lead
a thinker to the conclusion he's trying to reach. The
conclusion may in fact accurately reflect reality--it may
be 'true'. But we quite literally have no 'reason' to
accept it along the lines the proponent gives us.

Now, here's the next problem. In a protracted argument, the
proponent will marshal a number (sometimes a vast number)
of subsidary arguments in service of a certain number of
overall goals for conclusion. However, for this process to
work properly, the subsidary arguments must themselves be
valid. An invalid argument (or, you may say, a 'mistake')
undercuts any further argument which may be built on its
conclusion. This can have wide-reaching effects, as anyone
knows who has tried to work out a particularly thorny math
problem. I once was simplifying a complex algebra formula,
and after a page of work I ended with (6h)=h (or 'Six
multiplied by any number equals that number.') This is
false: only one number (zero) can be multiplied by 6 to

equal itself, and that's only another way of stating that 'Nothing = nothing', which is true but not worth saying. If I followed the math one step further and divided both sides of the equation by 'h' (which would be legal), I would end with the conclusion that 6=1. This is a nonsense statement. Either way, this was a sign that either the original complicated formula was _itself_ a nonsense statement, or I had made a serious mistake somewhere earlier in the argument. (As it happens, I had made the error in about the 3rd step out of 15 I had taken.)

Unfortunately, very long complicated protracted arguments with numerous important subsidary points can provide a situation where a proponent of the overall conclusion tends to discuss isolated points _within_ the whole argument structure. Taken by themselves, these positions may be quite sensible; but the proponent may forget that position R depends on position C being _itself_ valid.

And now we've come to the point of _Straw Man Burning_ (or SMB). In the early months of 1999, I first saw mention of Richard Dawkins' _The Blind Watchmaker_ (or TBW), a book which (at the time) had been in circulation for roughly 13 years. Mr. Dawkins has apparently been a very influential spokesman for biological evolutionary theory and philosophical evolutionism. (I'll define those terms more closely in a moment.)

I, myself, accepted (and still accept) biological evolutionary theory; at least insofar as a non-expert presented with a general knowledge of the theory over a period of years from non-technical non-hostile publications (for instance, _Discovery_ magazine and its attendent cable channel) could be said to 'accept' a scientific theory. At the same time, I have considerably more than a passing knowledge of (and ability in) metaphysical Christian apologetics, which I also accept. As far as I can tell, the two ideas are not incompatible; but of course, Mr. Dawkins does not share that opinion. On the contrary, the very subtitle of his book, "Why the Evidence for Evolution Reveals a Universe Without Design" alerts the potential reader immediately that Mr. Dawkins intends to argue that (at the very least) God did not create Nature. This happens to fall pretty squarely into an area where I consider myself to be fairly adept; more to the point, it directly challenges the way I view reality.

At any rate, I discovered that some message-board members whom I knew (and who knew me) would be discussing TBW among themselves using the sort of methods I've described at the beginning of this Preface. I also had managed to build a small reputation as a Christian apologist on the message-board (though of course 99% of the time I'm there for other purposes altogether.) It occurred to me that a few of the people involved might appreciate an opinion from me on the subject; so I hopped over to the online bookstore Amazon.com to get my own copy.

I expected TBW would be mainly a straight-up discussion of the biological principles of evolutionary theory, and their applications (which I would have found very useful); along with, perhaps, one or two short sections devoted to topics on which I might have more than merely observational observations! I supposed that there'd be three or four minor topics on which I could enter into debate in what might be considered 'my' field. The first hint I discovered that the situation would be rather different, was in reading the reviews posted for the book on Amazon; they had a tonal quality and subject structure (which we could politely call 'triumphalism') that I recognized immediately--the same sort of tone and structure I tend to find in reviews for fundamentalistic creationism literature! However, I decided to wait until I received the book until drawing any conclusions from this. (Sometimes I see the same sort of full-throttle triumphant rhapsodies applied to books that I know from experience are carefully qualified scholarly tomes; it happens.)

The first thing you should know about TBW, if you happen not to have read it, is that the entire book is saturated with the same tone and subject structure that I found in the reviews--a perception which is reinforced immediately by the back-cover description on the 1996 edition and the 'professional' review-blurbs chosen by the publisher and/or Mr. Dawkins for that edition. Now, please note: _that doesn't mean the book is wrong_. That's saying absolutely nothing about the content or quality of conclusions found in TBW. Nevertheless, it's a popular book written on a popular level to a popular audience; readers looking for a textbook treatment of the subject should probably apply elsewhere.

Very well then; since I committed myself to reading the book through thoroughly, I decided I'd better take a few

notes to refer back to when I was finished so that I'd be
able to quote in context when I was ready to join the
discussion. Eight pages later, I realized that I had
already written many more notes than I had anticipated
making for half the book (much less half the chapter.)

Furthermore, I found myself bemusedly predicting that by
the time the discussion got around to later chapters, many
of the discussion members would probably have already
forgotten some rather important issues raised earlier in
TBW (and earlier in the discussion), and I'd have to try to
make those points all over again to illustrate the degree
to which those later issues would depend on (and even
conflict with) earlier issues. What I almost needed to do,
I thought to myself, was present one long in-depth scan of
the whole book so that some kind of organic coherency could
be established between different issues at different points
in TBW.

In other words, TBW needed a _persistant_ criticism.

The discussion has been over for months, and I never got
around to joining it; but in the following chapters you'll
find the notes I kept as I followed Mr. Dawkins through his
protracted argument.

What sort of book is _Straw Man Burning_? Who am I to write
it? Nobody, as it happens. I have no degree in the relevant
topics; I have no positions from previously published
articles or books to justify; I don't make my living doing
this sort of job. In short, I represent the sort of
audience for whom Mr. Dawkins wrote TBW in the first place,
albeit the section of that audience who starts with a
belief in some variety of supernatural creationism
('orthodox' or 'traditional' or 'mere' Christianity in my
case), whom Mr. Dawkins would like to convince otherwise. I
am not, of course, _entirely_ a cipher in interests and
abilities; theology is my hobby (not my vocation), and like
very many people I take my hobby seriously enough to be
proficient at it. It may even be possible that I have, in
effect, the skill of an expert in some limited areas of
this subject; that is not for me to claim, but for
'professional' theologians, philosophers and metaphysicists
to judge. However, TBW must have been (or at least should
have been) designed for people in my position, too. The
fact that I go into TBW already on the side of biological

evolutionary theory should counterbalance, to some degree, the fact that I go into it already enlisted on the side of some of Mr. Dawkins' philosophical opponents. And this is as good a place as any to turn aside briefly and discuss what I mean by this division.

Biological evolutionary theory is, as far as my purposes go, any of a set of scientific theories which provides a framework for understanding the relationship of species in the past with species in the present (and, presuming those relationships continue, with species in the future.) As a scientific _theory_ it exists as a series of inferences drawn from data about reality (in other words, it is not a flat assertion.) As a scientific _theory_, it stands as a system which can still be improved and added to, though this need not necessarily be taking place at any given moment; but nevertheless can still be (as far as it goes) true or false in particulars and may reach a point where it exhausts and accounts for all data pertinent to its purview. You will notice that I do _not_ accept contentions such as 'A theory means it might not be true'. A student taking his first geometry class learns almost immediately that theories can, in fact, be perfectly unarguably undeniably true--_given_ certain preconditions. (I make this point specifically for the sake of some of my creationist brethren, who need to play fairly on this topic; though of course, it's entirely possible for an atheist to reject some theological 'theory' on the same illegitimate grounds!)

As a _scientific_ theory, it provides a framework for discovering, examining and relating the characteristics of connections (if any) between material objects; with the presumption that _as such_ these relationships will stay constant in principle (though they will, of course, vary in effect given different prior effects), and that these relationships may be treated in an intention-neutral fashion. In a more restrictive sense, this particular _kind_ of scientific theory deals with the interactions of events integral to one and only one level of reality. Please note that this does _not_ necessarily require a prior restriction of reality 'total' to one and only one level; a scientist studying fish at an aquarium research facility need not be concerned with rainforests in other parts of the world. He need not even be concerned with atmospheric conditions in contact with the aquarium-- though, then again, some scientists might specialize in

that. In broad terms, I consider a scientific theory in general to stand in relation to the aquarium-focused scientist; it provides a framework for studying effects within one and only one level of reality (the level we call Nature), with a rather limited set of presuppositions which correspond to qualities of this level and not other levels (if any.) As far as we can ascertain, the basic units of matter and energy do not have conscious 'intentions'; therefore, a scientific theory focusing on natural operations must take this into account and apply it as necessary to further propositions and conclusions. You will notice, however, that such a view is not intrinsically _necessary_ for 'scientific' study; and in fact up through the beginning of this century there were still scientists whose work presupposed some kind of rudimentary intention on the part of basic physical units. They appear to have been wrong (though quantum scientists would probably tell us that, in all honesty, the question has been indefinitely mooted in limbo--which, for all practical purposes, means the same as treating the particles as non-intenders); but that doesn't by itself make them less 'scientific'. (Their working methodologies would probably have much more bearing on that sort of third-party judgement.)

You should also note that such a view, while not intrinsically excluding supersystem impingement, certainly provides a sort of environment in which a person studying Nature along those lines might begin habitually discounting supersystem possibilities--a sort of 'tunnel-vision' effect. Such an effect would be just as likely to build up a false belief as a true one, and so cannot be used to justify the conclusion 'There is nothing except Nature'. In principle, most people who think this out for themselves understand and accept it; but, of course, there may be good reasons on _other_ grounds for concluding that only Nature exists, as a system which at bottom has no sentience.

At this point, we have left 'scientific' beliefs and conclusions, and have moved on to philosophy. Many people believe that there is only one level of reality, or one 'Nature' (or one 'system'), and that this level is, at bottom, completely non-sentient. These people are generally described as philosophical naturalists, or often simply as naturalists. (Note: 'naturalist' may also be the job description of some types of zoologists and biologists. There is no necessary connection between the two usages of 'naturalist'.) Some people believe that only one level of

reality, or only one system, exists; and that this system or level or reality is, at bottom, sentient (to one degree or another). These people may generally be described as pantheists. Rounding out the usual suspects, some people believe that more than one level of reality exists and that one level of reality is independent of the others and is, at bottom, sentient (to one degree or another.) These people may be described as theists.

Obviously this doesn't quite fill out the whole picture. Technically, a person who disbelieves that the final ground of reality is sentient, might still accept that there are multiple levels of reality--she would not be a naturalist, but would still be an atheist: a supernaturalistic atheist. I am sure people exist who hold this belief, but for some reason most atheists seem to be naturalists. For most discussions, it makes little difference in the end whether an atheist is a naturalist or supernaturalist. Cosmological dualism is another category of belief. In it, two or more systems or grounding entities exist which are completely independent of each other, though other systems and entities will be dependant on them. However, though such a belief may be technically supernaturalistic, in practical matters a nominal deist--who believes in a completely independent nature and God--defends positions that might as well be naturalistic, against virtually all other supernaturalistic positions. Otherwise, on the face of it at least, a dualist may be considered some sort of theist. Polytheisms may be considered to be theisms, naturalisms, atheisms or any number of mixed categories, depending on how particular polytheisms posit the final ground of reality and the relationship of all dependent entities to that ground. Greek paganism, essentially, might best be considered naturalism, for instance; the gods are dependent in certain fashions on the natural order, particularly for their existence; and Chaos from which they sprang, is the underlying natural order which is nonsentient and amoral. Thus, there is really only one system of reality, which is ultimately nonsentient, though the gods are of course very powerful within that system. Then again, so are humans compared to ants. At any rate, the main three branches of philosophy, within which (as far as I can tell) any world-view ultimately fits, are atheism (which is almost always naturalism); pantheism; and theism.

A subgroup has arisen within naturalism to displace virtually all its rivals within that branch: philosophical

evolutionism. Proponents of evolutionism look explicitly to
biological evolutionary theory to lend either primary
argumentative support or secondary confirmational support
to naturalism. A philosophical evolutionismist would feel
entirely comfortable writing the following phrase: "Why the
Evidence of Evolution Reveals a Universe Without Design."
Shortly put, what we learn about biological science proves
that there is no God--that the ultimate level of reality
(and there's only one level for a naturalist) is non-
sentient. Now, there could be naturalists who accept
biological evolutionary theory who are not philosophical
evolutionismists--who think that naturalism (or at least
some kind of atheism) cannot be argued for on the _basis_
of scientific theory. And, as I can testify, there are
certainly supernaturalistic creationistic theists who have
no problem accepting biological evolution as a working
theory. Nevertheless, one characteristic of a philosophical
evolutionismist which I think they must all share is this:
they adamantly insist that no distinction exists between
the conclusions we reach in science and the conclusions we
reach in philosophy. Certainly, Mr. Dawkins makes it quite
clear that _he_, at any rate, does not accept the idea that
biological evolutionary theory can consistently function as
such as part of a supernaturalistic theistic worldview; it
must be one or the other, and since he finds the science to
work, then theism must be discarded.

I do not intend, in SMB, to discuss much further the
question of whether evolutionary theories can consistently
exist as part of a worldview other than naturalism--though
I certainly think it a worthy topic for discussion. The way
Mr. Dawkins constructs his argument allows us, I think, to
leave that question mostly to one side. I _think_ it will
become clear, in a secondary sort of manner, that an
insistence on _either_ evolution _or_ theism is not a
necessary position; but I'll leave you, the reader, to
judge that for yourself. (Rather humorously, some of the
more--shall we say--colorfully vocal members of my side of
the aisle would agree with Mr. Dawkins on this issue 100%.
At least, it is not necessarily _my_ view.)

This leads me back to one of the questions with which I
started this second part of my Preface: what _are_ my
intentions in SMB? What kind of book is it?

I will be following along with Mr. Dawkins as he presents
his positions and arguments and data, reproducing as much

of TBW as I legally can for purposes of establishing context--though I strongly recommend that if you haven't got access to a copy of TBW, you should get a copy for yourself and follow along with me. I particularly recommend this if, for whatever reason, you disagree with supernaturalistic creationistic theism as a valid theory; that way you can ensure to your satisfaction that I don't take Mr. Dawkins' words out of context--or, that I _have_ done so!

Primarily, I'll be checking to ensure that Mr. Dawkins plays fair with the data he presents; does he contradict himself, presuppose his conclusions, misrepresent an issue? I'll essentially allow him to present the data itself as an 'expert witness', with little disputational commentary (though occasionally with some corroborative commentary if I happen to know a little bit about the topic), _except_ if he misrepresents some data which falls outside his professional purview and/or falls into my own arena. Because the notes are written more-or-less in a casual, informal manner (in some places representing stream-of-consciousness material), you may find me haring off once or twice on a trivial side-note, though I'll try to warn severer readers when this is about to happen. I've tried to make my commentary as accessible as possible to a wide range of potential readers, but be warned ahead of time that some issues require by necessity that I get very technical. I won't apologize for that; but I've tried to include as many illustrative analogies as I could think of to help readers get the idea of what I'm trying to say.

What I want to ensure, at all levels of my commentary, is _fair play_. When Mr. Dawkins does something 'cool', I want the reader to know. When he makes a mistake, I want the reader to know. I want to get the best possible use out of his book that I can; but part of that _might_ (you may safely guess _will_!) entail analyzing his errors to see what I can learn from _them_.

Furthermore, you will find that I try very hard to bring a personal level to this work. This is no accident: in fact, it is one of the most important points. In books of this sort, we are dealing with (on numerous levels) contentions about humanity as a species. Professional authors often speak in a manufactured 'third-party' tense. There's some merit to this, at it helps defuse potentially accusatory or threatening material, and lends an air of objectivity to

the proceedings. But sometimes that air is only hot air; and in such cases it would be more honest to state personal beliefs as _personal_ beliefs. Even more important, there is a gigantic risk involved if we discuss aspects of humanity from a rarefied 'observational' view; particularly in the case of philosophies and scientific studies of human biology (or behavior). I find, when I look at these sorts of theories, a preponderance of positions taken concerning 'humans' or 'Man' or 'mankind' or 'people', in the abstract, which would be exposed as manifest nonsense if the author tried applying the position _TO HIMSELF_! I know, that sounds hard to believe; but it happens. I think you will see Mr. Dawkins do it himself, again and again.

In fact, if I ran the philosophical world (or, perhaps, the world of the 'humanities' as a group of subjects), I would make at least one ironclad inviolable rule: always, ALWAYS test a contention out by applying it to yourself if at all possible. This is known as the 'self-reflexivity' test; and we'd pare down the list of theory contenders dramatically if their adherents bothered to apply it rigorously. You, the reader, might wish to keep that in mind as well when you judge the ideas presented in books--even the ideas in this one! In fact, I'll be asking 'you' again and again throughout SMB to apply this sort of test, or to imagine the results of Mr. Dawkins applying it. The results can be profound.

(Note: occasionally I'll speak of 'my reader' in the third person as well; in such cases, third-person pronouns may become necessary. We have no specifically neuter pronoun in English, though the masculine stands in for it. Normally I follow English speaking convention and use the masculine for such situations; but in this case I'm already talking about 'he' and 'him' so much in reference to Mr. Dawkins and his arguments that you--or even I myself!--may forget which 'he' I'm talking about: Mr. Dawkins or my reader. Therefore, I have chosen to use the feminine tense pronouns on those rare instances, and speak of my reader as a singular 'she'. This may give the inadvertent impression that my book was written with one particular correspondent in mind. This is emphatically not the case, and I'd prefer if future critics of my own book not make guesses about, for instance, which of my editing team I was writing my book 'for'. When I speak of hypothetical case-subjects, I will occasionally use masculine or feminine for those

'characters' as the mood suits me at the moment; again,
please don't read anything into this.)

At any rate, each of my official 'chapters' mirrors the
complimentary chapter from TBW; except for Chapters 12 and
13 where I present concluding summaries, observations and
conclusions. I've also included some appendicies, dealing
with other matters.

What about dealing with Mr. Dawkins' own preliminary
material? My copy of the 1996 edition of TBW includes the
original preface and a new introduction, both written by
Mr. Dawkins. The introduction contains a declaration by Mr.
Dawkins that, although he expected to have to rewrite and
correct some errors in his original edition for the 10th
year reissue, he couldn't find any worth correcting.
Instead, he states that he would have expanded on the same
topics discussed here, and apparently has already done so
with his 1996 book _Climbing Mount Improbable_. Rather than
jink around from book to book, though, I have chosen to
take him at his implication that his new book does _not_
offer corrections--or, as he puts it, a "satisfying
catharsis"--to anything in TBW. Readers familiar with both
books will have to judge this issue for themselves.
Otherwise the introduction contains a short restatement of
his views about evolution provided in his following (and
original) preface; a list of books published since his
first edition to which he recommends we go for further
information on the topics he discusses in TBW; and four
paragraphs (about a full page) of disparaging remarks aimed
at creationists. No arguments are presented, and (in
hindsight) I have referred back to all the interesting
Introductory material in my own notes, though at various
places. So I'll be presenting some commentary on his 1996
Introduction; but not collected here in my own preface.

Mr. Dawkins' original preface introduces his goal, which is
to explain 'apparent design' in nature--specifically, how
(in principle) the extreme complexities of efficient
biological structure came to be what they are. He points
out that he fully intends to "use the tricks of the
advocate's trade", rather than merely write a dispassionate
tome laying the evidence before the reader. Furthermore, he
specifically clarifies that he wants "to persuade the
reader, not just that the Darwinian world-view _happens_ to
be true, but that it is the only known theory that _could_,
in principle, solve the mystery of our existence." [his

italics, p xiv] He spends about a page and a half musing over the question of why it took so long for Darwinian evolutionary theory to be developed and then to be accepted; rather refreshingly (particularly considered in contrast to his introduction and other parts of his book) he doesn't exactly _fault_ the "creationists" for this. He concludes with a paragraph idly considering the question of which parts of his book may one day become "ephemeral" (in other words, which parts will one day seem like unnecessary additions); one paragraph explaining his own gender-pronoun strategy (similar to mine in many respects!); and then the usual thanks-to-the editors.

[Note to editor team: this will probably be the place where I turn aside for a moment to recognize you and your contributions.]

There are no arguments, per se, in the preface, and any positions he raises here will be dealt with in-depth in the body of his (and my) work. But my initial impression of the book was nevertheless expressed in my response to a statement of his from his preface, p xvi--my very first written comment about TBW, with which I here conclude my own Preface:

If Mr. Dawkins thinks that "complex elegance" as "an indicator of premeditated, crafted design" is "probably the most powerful reason for the belief... in some kind of supernatural deity", then he has almost completely missed the philosophical boat. Let the straw men burn freely, by all means; but don't anyone kid himself about what Mr. Dawkins' 'achievements' are.

Don't Break Out the Champagne Just Yet
aka, Chapter 1: Explaining The Very Improbable

"I marvel at the boldness with which these people presume to speak of
God. In addressing their arguments to unbelievers, their first chapter
is the proof of the existence of God from the works of nature. [...]
But for those... people deprived of faith and grace, examining with
such light as they have everything they see in nature that might lead
them to this knowledge... this is giving them cause to think that the
proofs of our religion are indeed feeble, and reason and experience
tell me that nothing is more likely to bring it into contempt in their
eyes. This is not how Scripture speaks... It is a remarkable fact that
no canonical author has ever used nature to prove God... 'Why, do you
not say yourself that the sky and the birds prove God?' - 'No.' - 'Does
your religion not say so?' - 'No. For though it is true in a sense for
some souls whom God has enlightened in this way, yet it is untrue for
the majority.'" -- Blaise Pascal, Christian apologist, _Pensees_, 781
(242), 463 (243), 3 (244), published 1670; translated by A.J.
Krailsheimer, Penguin/Butnam:New York, 1966.

"If what you want is an argument against Christianity (and I well
remember how eagerly I looked for such an argument when I began to be
afraid it was true) you can easily find some stupid and unsatisfactory
Christian and say, 'So there's your boasted new man! Give me the old
kind.' But if once you have begun to see that Christianity is on other
grounds probable, you will know in your heart that this is only evading
the issue." -- Clive Staples Lewis, _Mere Christianity_,
Collier/MacMillan:New York, 1952, p 168.

p 1 "Biology is the study of complicated things that give
the appearance of having been designed for a purpose.
Physics is the study of simple things that do not tempt us
to invoke design."
 I think this is a highly misleading and imprecise means of
defining the two fields of study. Very convenient for later
philosophizing, perhaps; but somehow in my "backwoods"
physics, chemistry and biology classes, the apparent design
or lack of it wasn't a chief distinguishing characteristic
between biology and physics. It was primitive, backwards-
thinking sorts of differences, like the study of the
interaction of subatomic forces vs. the particular ways in
which organisms with primarily organic (as opposed to
inorganic) molecular structures react within their
environment. And where is 'chemistry' in that duo?
Apparently, had I gotten past high-school biology and
physics, I would have reached this more useful distinction.
Or maybe it's something peculiar to Oxford.
 And, hewing to Mr. Dawkins' future penchant of drawing his
own overliteral illustrations from Scripture, does he mean
that such things as weather and mountains fall into the
classification of biology? The Jews, among other cultures,

were "tempted" to invoke design for such things; simply
check any number of Psalms (or Genesis 1, if you don't have
the time!) Quite a few of us modern Christian theists are
"tempted" to do the same thing, adding in such entities as
spiral nebulae, pulsars, etc. In fact, any Creationistic
theist worth the name--including the fundamentalists Mr.
Dawkins has such a low opinion of--would not make this
distinction at all; Christians don't tend to think that God
invented wheat and not, say, muons. I'm pretty sure this
goes for Jews and Muslims, too. Who does Mr. Dawkins mean
when he says non-biological objects "do not tempt _us_ to
invoke design"?
 Perhaps what Mr. Dawkins means here is '_I_ am not tempted
to invoke design' for non-biological objects. In other
words, despite the massive complexity of interactions
within a star, he understands that the number of _types_ of
interactions are relavtively few compared to, say, those in
a frog. (He says as much on p.2, though in different
words.) Very well; but then, why make the distinction?
Design implies intent, and I would guess that he sees no
intent ("haphazard" is the word he uses to describe the
reactions, on p.2) in the workings of a star, while he
might be tempted to see intent in the workings of a frog--
and he certainly sees it in the workings of a computer!
(see below) But then, the ancient Jews saw no apparent use
for mountains, or even in what they would have considered
'biological' objects like lions. Yet they believed God had
created mountains and lions anyway. One of the points here
is that Mr. Dawkins presents an oblique history of the
evolution of thought about a Designer, which doesn't
actually fit what we have as evidence in terms of what
these people thought.
 Moving on, I have no problem with Mr. Dawkins' lumping of
cars and computers into his class of 'biology', when taking
into account their purposeful design. But I think that if
he's really trying to get to the truth of our reality, then
I can only say that starting by "firmly treating [them in
this book] as biological objects" [p.1] as explicitly
opposed to treating them as examples of 'physics' (else "at
first sight" they would not otherwise "seem to provide
exceptions" to his distinction [p.1]), sets up a convenient
and arbitrary means of classification. It may have some
uses; I can think of a few sociological ones, and I'm not
even a sociologist! But it can be abused, too. For
instance, if (as he says on p.2), "Machines... derive their
complexity and design from living objects, and they are
[therefore] diagnostic of the existence of life on a

planet", then I have to wonder why he's quite willing to
apply a variation of the Argument from Design at _this_
point. Please note: he does not count specific physical
properties (as such) as being the signal for why these
should be treated as good evidence for a limited AfD, in
terms of whether they had creators or just happened; he
only mentions, here, two extremely general qualifiers:
their "complexity and design." (And I suppose, unless he's
already arguing in a circle, he really means "apparent
design".) Now the question is whether he plays fair, and
later says something to the effect of: 'But complexity and
(apparent) design are, by themselves, _insufficient_
reasons to suspect life on that planet.' When he ends that
paragraph by comparing such machines favorably to fossils,
skeletons, and dead bodies as evidence of prior life, I get
the feeling that he isn't going to note his own
discrepency.

Hindsight note: Although he never quite acknowledges the
discrepencies here, his later remarks make it clear that
the real reason he would count those objects as evidence of
designers is because he thinks only organic processes are
capable of spontaneously reacting and counterreacting to
the point of developing this level of complexity and
efficiency. Since cars and computers (despite his label of
'biological') are actually inorganic, they would thus count
as evidence of intended design instead of nonintentional
development. There is still some sleight-of-hand and
circularity here, but at least this idea is self-consistent
within his overall scheme. However, please note that a
sensible conclusion of "prior designers" can still be held
by believers in a cosmic Designer, in such a situation.
Both sides can reach the same conclusions (through slightly
different criteria) on this subject.
 Mr. Dawkins, in an aside, writes that, "In my
nonprofessional life I am quite prepared to get worked up
about people who boil lobsters alive." [p.2] Having
finished the book, let me advise the reader to take a
yellow marker and flag this passage. You'll know when I get
back to it. (When I first read this chapter, this remark
set up little warning bells for me; I know _I_ was glad I
had marked it later!)
 p 3, "Our brains are no better equipped to handle extremes
of complexity than extremes of size and the other difficult
extremes of physics... What we can do is understand some of
the general principles of how living things work, and why
they exist at all."

Actually, I agree with this. It will be interesting, though, to see whether Mr. Dawkins nevertheless intends to use the massive complexity he references here (exponentialized beyond even this, as he himself testifies, in organic compounds and biological reactions) as a means of justifying something like our ability to reason, even if the general principles don't hold up. I have certainly seen this before in other writers; but perhaps Mr. Dawkins will be different. If not, I refer him back to this point, and to the following paragraph where he (quite rightly) describes how we rely on an understanding of coherent general principles to get around our lack of ability to totally comprehend an ultracomplicated physics situation. It doesn't necessarily work the other way; in his example, the _wing_ specialists don't necessarily validate their _suspicions_ of general _engine_ principles by referring to the ultracomplicated reactions going on in and around the engine. Doutless, if they did so, they might _derive_ some general principles (and their engine specialist brethren would probably have some clarifying comments to make); but they won't necessarily be justifying the beliefs they _started_ with. They have to play fair and not try to pretend that what they discover fits back into the general principle they began with if, in fact, it does not. Surely this isn't too hard a principle in itself to grasp; Mr. Dawkins has his own friendly illustration in astrophysical Doppler-shift dating vs. 6 days of creation! But sauce for the goose is sauce for the gander.

 p 3, "I myself flatly refused to believe Darwin's theory when I first heard about it as a child."

 Hmm... I wonder why? In the past, I have discovered that when philosophers (usually pop-philosophers) nuke fundamentalism to the exclusion of attending to other proponents of supernaturalistic theism, they often (though not always) come from a fundamentalist background themselves. This by itself would not, of course, demonstrate that Mr. Dawkins is wrong; but it might explain, if he were wrong, why he hasn't bothered to recognize it yet. And, even if he were right, I think it would partly explain why he whales on the fundamentalists. Or, perhaps I'm mistaken; certainly, fundamentalists can be irritating enough that almost any significant exposure to them is likely to embitter one against them. I know I have to work hard not to get hacked off at them, and I _agree_ with them on almost every topic!

p 4, Mr. Dawkins' first target of opportunity is raised to
the gallows: William Paley and his _Natural Theology_,
which Mr. Dawkins presents as "the best-known exposition of
the 'Argument from Design'" which, in turn, is "always the
most influential of the arguments for the existence of a
God." Well, I suppose that's better than saying "the most
powerful argument" (refer back to my remark on his
Preface). We'll just ignore Pascal (no big fan of the AfD,
he!), and Lewis (fan of evolution, not a fan of the AfD),
and Plantinga, and Hasker, and Moreland and... well, we'll
just ignore all those other troublemakers. Their arguments
go over most people's heads, so they're probably not worth
considering.

To be fair, Mr. Dawkins does give Paley some favorable
marks on compositional style, etc. But if by taking him
out, Mr. Dawkins thinks he can conclude that a Designer
philosophy is "gloriously, utterly wrong", then I think
even if I were an atheist I'd be banging my head on my
keyboard and trying to initiate damage-control.
 p 5, "Natural selection, the blind, unconscious, automatic
process which Darwin discovered... has no purpose in mind."
 Note this: we'll come back to it (and many similar
statements like it) later, after he's had a chance to make
his case more fully. Meanwhile, you might want to start
asking yourself whether Mr. Dawkins' argument itself is the
product of a "blind, unconscious, automatic process" which
"has no purpose in mind"; and if not, how Mr. Dawkins
intends to make this shift.
 p 6, Mr. Dawkins makes a quick mention of Hume, and gets
what I think is the proper conclusion out of him ("he did
not offer any _alternative_ explanation for apparent design
[in his criticism of the logic of the AfD], but left the
question open." [italics his]) This still seems a bit of a
short shrift to Hume, though; he also wrote a great deal on
probability, even in his essay on miracles (to which Mr.
Dawkins is referring, I suppose. The index actually refers
to Mackie's ironically titled _Miracle of Theism_.) Of
course, there are some philosophers who think Hume was
quite inconsistent with his application of probability
between his essay on miracles and some of his other work.
But considering how much Mr. Dawkins intends to make his
case on the perception of probability, he might have cut
Hume even more credit. As far as I can tell, Hume isn't
mentioned for the rest of the book; at least, he's not in
the index anywhere else. I guess we'll see. (Hindsight
note: Hume isn't mentioned again.)

 p 6 "I like to think that Hume would agree [that Darwin
made it possible to be an intellectually fulfilled
atheist], but some of [Hume's] writings suggest that he
underestimated the complexity and beauty of biological
design."
 No real criticism yet on this point--I'm not familiar
enough with Hume's writings to say yea or nay about that,
though I hear rumbles from other scholars that after all
was said and done, Hume still thought theism was more
sensible than naturalism--but it occurs to me that Mr.
Dawkins talks a lot about Nature's beauty and complexity.
I've got no problem with this, as far as it goes, but in
the past I've seen pop-philosophers attempting to use
Nature's beauty and complexity as some sort of weapon in
their favor. It isn't. It's not in anybody's favor. If Mr.
Dawkins (or if, perhaps, not him but someone else) wishes
to use Nature's beauty and complexity as some kind of
justification for philosophical naturalism, then I submit
that the principles of the Argument from Design which have
been shot down so cleanly lo these many decades past, are
now being smuggled back in surriptiously on the side of the
naturalists. I haven't seen Mr. Dawkins do this yet; if he
does, I'll make note of it. But even if he doesn't, beware
good reader lest you take up the faulty sword of the enemy
for your own use.
 p.7 "Mont Blanc has a heterogeneity of structure not
possessed by a blancmange, but it is still not complex in
the sense in which a biologist uses the term."
 I suppose that's true enough, in several senses! But, to
be fair to Mr. Dawkins, he is (finally) beginning to define
"biological complexity" as he's using the concept, and I
wanted to put in here that up to this point he's doing an
interesting job. Let's see where he goes from here...
 p.7 "Suppose we try out the following definition: a
complex thing is something whose constituent parts are
arranged in such a way that it is unlikely to have arisen
by chance alone."
 A rather unique definition of 'complex', which I suspect
has the primary function of setting the game-rules in favor
of his coming propositions; let's wait and see whether this
definition returns to haunt him, though. After all,
whatever one says about Mont Blanc, _it_ didn't arise "by
chance alone", either, if "by chance alone" we mean an
event with no natural constraints. Setting up a definition
for something that requires as a precondition an
improbability of some condition ("arising by chance alone")
that can't happen to anything anyway, would be (at best) a

very dangerous foundation on which to build an argument.
We'll have to wait until he gets to the part about the
combination of chance and necessary determinism to see one
of the potential problems here. To his credit, Mr. Dawkins
foresees this question of mine. He intends to answer it at
this point (different answer later) by adding the concept
of uniqueness to the definition, as illustrated below:
 p.7 "The combination lock on my bicycle has 4,096
different positions. Every one of these is equally
'improbable' in the sense that, if you spin the wheels at
random, every one of the 4,096 positions is equally
unlikely to turn up. [...] That is equivalent to regarding
the particular arrangement of rocks on a mountain... as
'complex'. But one of those 4,096 wheel positions really is
interestingly unique: the combination 1207 is the only one
that opens the lock. The uniqueness of 1207 has nothing to
do with hindsight: it is specified in advance **by the
manufacturer.**" [italics mine]
 Not a bad illustration of uniqueness, so far, but I note
that the conditions which determine the real uniqueness of
the number are explicitly acknowledged to be specificed in
advance by the maker of the lock. At best, that's probably
not a particularly good illustration in a book devoted to
arguing _against_ a cosmic or meta-cosmic Designer!
 p.7 "If you spun the wheels at random and happened to hit
1207 the first time, you would be able to steal the bike,
and it would seem a minor miracle."
 Assuming, of course, there _are not_ such things as
miracles. We wouldn't want to _start_ with the exclusion of
God's, or supernature's, existence and then go on to
'prove' that neither exists. Right?? That would be, like,
y'know... <ahem> cheating.
 p. 8 "But Mont Blanc as we know it is defined in
hindsight. Any one of a very large number of ways of
throwing rocks together would be labelled a mountain, and
might have been named Mont Blanc. There is nothing special
about the particular Mont Blanc that we know, nothing
specified in advance."
 Whoa, huge systematic error here. This is absolute, flat
assumption of the point which he wishes to "reveal" (his
words in the subtitle) in his work. That's the whole point
of his book; to "reveal" that, in so many words, things
like Mont Blanc are not specified in advance! (A Designer
would, by definition, have specified Mont Blanc to some
degree in advance, even if it were only the specifications
of the basic material and physical laws which eventually
produced the mountain.) He can't start with that as an

axiomatic assertion and then draw his argument from it! I would agree, any atheist or theist would agree, that _humans_ didn't specify Mont Blanc in advance. But TBW's subtitle is not "Why The Evidence of Evolution Reveals a Universe Humans Didn't Design"! His definition of relative complexity, with which he intends to illustrate that God doesn't exist (a far more ambitious goal than even stopping with, "Well, God doesn't _have_ to exist"), requires _as a necessary premise_ the conclusion (there is no Specifier) he's trying to reach!! This is extremely faulty logical argument.

 p.8 "At this point, some hawk-eyed philosopher... will start mumbling about a circular argument."

 Mumble, schmumble! I'm not even annoyed at what _he_ considers the possible 'circular argument' target in his example. ("It is with hindsight that we decide whether to judge the success of our random conglomeration...") That's as may be; I've got a far more devestating and basic circular argument further back there: with the mountain which has, as a _necessary condition_ for purposes of defining its relative non-complexity, the state of not being specified _at all_ (including by God) in advance! Depending on how important that concept of relative complexity turns out to be for his argument (and at this point I'm assuming it must be pretty important for him to put it first), he's already fatally shot himself in the foot before he reached his 10th page! In a book overtly and explicitly dedicated to convincing people that there is no Prior Specifier, he can't start by arbitrarily excluding the Specifier! He might, of course, manage to salvage a more modest victory if he can illustrate that naturalism is a viable alternative to theism; but atheists looking for a positive argument against theism had better not break out the champagne just yet.

 p.9 "The minimum requirement for us to recognize an object as an animal or plant is that it should succeed in [replicating]."

 I think that's a pretty fair summary of what makes a living thing 'living'. This is, for instance, why many biologists consider a virus to be living; it makes other viruses. A frog not only reproduces other frogs, but reproduces itself to some extent when it eats, breathes and drinks. I would probably tweak that definition a bit to read "has at least a chance of replicating", since success isn't even the definition of life for a species. Technically speaking, a mutant who can replicate is still a living sort of thing, even if it never replicates. Mr.

Dawkins' definition isn't quite rigorous, and he qualifies
himself a bit in that paragraph (better than I've
represented with that single quote), but it still sounds
fair. At least, I don't have anywhere near enough
biological training to disagree with it even if I wanted
to! I think he does an even better job of illustrating this
between pp. 9-10--though he then goes on to bait-n-switch
his propositions.
 p.9 "The answer we have arrived at is that complicated
things have some quality, specifiable in advance, that is
highly unlikely to have been acquired by random chance
alone. In the case of living things, the quality that is
specified in advance is, in some sense, 'proficiency'."
 Mmm-hmm. Who is it then that is specifying _that_ quality
in advance? Can't be God because Mr. Dawkins has already
arbitrarily excluded God a bit earlier in his claim that
Mont Blanc _isn't_ specified in advance. Must be us humans;
but then, that means that Mont Blanc and other things he's
mentioned, like the moon, are relatively noncomplex only
because _we_ didn't specify them in advance. And frogs
would have to be relatively non-complex, too, because we
didn't specify them in advance. And humans, because...? I
think his argument here is not only circular but self-
destructive with relation to his intent! If you follow it
out to the end, only human artifacts are complex (maybe)! I
hope he's got a better explanation later for 'specified in
advance' that solves these problems.
 I realize that he's taking 'specified in advance' in a
very general sense here; but when it comes to excluding
something as "complex" because it has _no_ qualities
'specified in advance' (as he does with objects like Mont
Blanc), he can't use a vague general sense. If he wants it
to work one way, he has to keep it like that for the other;
otherwise he's committing a logical fallacy by switching
the emphasis of his terms as it becomes convenient. This
can be put another way; he might reply that he only meant
that, even if a human never existed to specify the frog's
proficiency in advance, it would still be proficient and
since we do exist we recognize that proficiency. Fine. But
that's not 'specifiable in advance' in the philosophically
narrow sense which he wants to use when it comes time to
exclude something's 'complexity'.
 p 10, Mr. Dawkins gives us an example of how Mont Blanc
doesn't work to maintain its existence. Mont Blanc,
according to him, falls into the category of things which
"accept the forces that tend to bring them into equilibrium
with their surroundings." The question that springs

immediately to my mind is whether the other class of
things, the 'complex' things, do _not_ 'accept' the forces
that tend to bring them into equilibrium with their
surroundings. Specifically, what does he mean by "accept"?
 Well, "accepting the forces" appears earlier to mean that
the entity in question doesn't 'work' to maintain itself.
But 'work' is a very slippery concept in philosophy. In
physics, it's not slippery; work is not an 'act' (itself a
term with rather important philosophical consequences which
we'll have to return to later), but a human means of
describing an object's mass multiplied by the object's
accelleration multiplied by the distance the object moves--
all for the express purpose of describing the object and
its relation to its environment. Presumably, this
definition of 'work' is held to be the proper one at the
atomic level. But where does it change, for Mr. Dawkins? It
has to change at some point, because otherwise there is
nothing in his system to distinguish a frog ('complex'
object) from the moon (relatively 'noncomplex'). But the
frog has very many moving parts, compared to the moon; can
we distinguish the 'work' of a frog's _heart_ (for
instance) from the 'work' of the moon? The heart also has
very many "complex" parts under his use of the term; it has
cells which replicate themselves in various fashions.
Perhaps the _cell's_ 'work' and the moon's 'work' exhibits
the place where the similarity comes into play? Well, the
cell still has quite a few replicating parts, so let's drop
down to the mitachondriae. Is _their_ 'work' the same yet
as the moon's? Maybe not: they have RNA and DNA if I'm not
mistaken, and those strings of molecules are capable of
"replicating" themselves. Let's get down to cytosine, a
chemical component of DNA. Does it exhibit the same sort of
'work' as the moon? Maybe, maybe not. It gets fuzzy about
right here. I think we'd have to agree that if we went one
step lower down to, say, one of cytosine's molecular
compounds (one doesn't immediately come to my mind, but I
suppose there are plenty to choose from), the sort of
'work' that this compositional compound does is expressible
in terms of physics: so much mass, so much accelleration,
so much distance. Every part of that cytosine features
'work' in the physics sense. But if I add up all those
little bits of reaction within the cytosine, is the
cytosine's 'work' (considered as the sum effect of all
those forces) _really_ different from the moon's? Is there
anything there yet, above and beyond the physical laws
which applied to the simpler molecules?

  Mr. Dawkins doesn't think so. "Certainly not" is the
phrase he uses to dismiss that possibility (and note, he
dismisses it flatly and axiomatically; he doesn't prove it
logically, nor has he yet even attempted to prove it
experimentally.) In fact, he uses that phrase to dismiss
the possibility that anything other than physical laws is
at work in the entire living thing itself (I've been using
the example of a 'frog' to make that living thing a bit
more specific.) In other words, he has to be carrying that
sort of physical reaction which we calculate as 'work' (in
terms of mass multipled by accelleration multiplied by
distance), all the way up from atomic reactions through the
frog, considered as an entity, with no remainders. Nothing
left over. (In hindsight, I note that we'll get an even
more specific example of this contention with a beaver in a
later chapter. And I also note, in passing, that he uses
the word "violates" when asserting that nothing is
introduced at any point in that 'frog' above and beyond the
physical laws. This is a huge misrepresentation of what
supernaturalists say happens with respect to nature and
supernature, but I'll leave that aside for the moment.)
  So, where is the difference--the _real difference_--in the
sorts of things he describes that would count as 'work' at
one level (the frog's, for instance) and what a physicist
or engineer would describe as 'work' at another level (a
carbon-based molecule, for instance)? It has to be a purely
arbitrary difference on his part; but then, if the
difference is a convenient illusion (and there are such
things, such as 'centrifugal force' or 'persistence of
vision'), he cannot continue by treating the difference as
a qualifiable one. This is one of the key bait-and-switches
which permeate naturalistic philosophy. It's not the most
devestating one; but it's devestating enough, I think, to
undercut lots of things he's about to try to reason out on
these grounds.
  The point is that Mr. Dawkins needs it both ways; he can't
introduce something other than physical laws, because he
knows perfectly well (as he himself makes abundantly clear
near the bottom of p.10) that if he does so he lets in
supernatural force, or the "life-force", or something like
that. But, he's got to introduce _something_ that makes a
real distinction, not just an apparent one. He's going to
try this starting in Chapter 3.
  You will note, if you have TBW handy, that _my_ objection
is practically the _opposite_ of what Mr. Dawkins considers
as an objection. In that case, he notes (quite properly)
that it is a _mistake_ to consider what he calls a

'complex' thing as _simply a whole_, and _not_ to apply the
laws of physics to its disparate parts. But that seems to
be what Mr. Dawkins himself is failing to do with regard to
the moon or Mont Blanc. It may be true that Mont Blanc
isn't going anywhere anytime soon, but it's hardly inert;
there are quintillions and quintillions of subatomic
particles, atoms and the like, all moving around in there.
The sum total of that movement is below the threshold of
human perception, but Mr. Dawkins has already warned us
about ignoring the processes of something simply because we
don't happen to see it going on ourselves. Geological
pressure is 'working' through the earth's crust and magma
to push that mountain up and keep it up against
gravitational forces; it is being worn away by wind, water
and plants; certain types of rock are being changed to
certain other types of rock inside it by pressure.
  I take it that these are results of what Mr. Dawkins calls
"the ordinary laws of physics" at the end of his paragraph,
p 10, as he describes what happens with Mont Blanc and
other similar 'less-complex' objects. But, be careful. That
phrase implies that there are 'special' or 'extraordinary'
laws of physics that are going to come into play
eventually. This is one of the places where the switch
comes in; there are no special or extraordinary laws of
physics that suddenly pop into existence once the
organization of a group of atoms reaches the complexity of,
say, a paramecium.
  The flying bird and the dead bird from p.11 are 'obeying'
the laws of physics (metaphorically speaking--and that's
important, too, but a topic for later) both as distinct
entities and _both_ as composite objects. There are no
new laws of physics in the flying bird. There are no
fewer laws of physics operating in the parts of the dead
bird. What is happening inside the live bird _is_ producing
indisputibly different results than what is happening
inside the dead bird, and one of those results is that
there's a difference in how the body as an entity fares.
But the difference is a quantitative difference, not a
qualitative one--at least, not a philosophically
qualitative one. What I mean is that there are no new
physical principles 'at work' inside the live bird; only
the same original principles 'at work'. They haven't
changed. The end positions and energy states of an
unimaginably vast number of atoms within each bird are
different for each bird at time X after they've both been
tossed. The atoms are certainly in physical and energetic
states in the live bird which they are not in the dead

bird; but then again, that's true for the dead bird
compared to the live bird, too. In terms of physical
quality, it's a wash.
 The live bird is special only because it has been
arbitrarily chosen to be that way by Mr. Dawkins; or, not
quite arbitrarily, but because the relative position and
energy states of the live bird's atoms are more closely
similar to us in some fashions than those of the dead bird.
That's fine. Given certain atoms' positions/energy states,
their future positions/energy states will fall into such-
and-such a range within this lapsed timeframe. The
similarity of this change among disparate sets of atoms
means the live bird and myself have beating hearts. The
operation of our hearts is governed by the same, exact,
precise physical laws which govern a dead heart's decay
into non-organic material, or perhaps the absorption of its
material into another biological entity. The results are
different; the guiding principles are the same. The fact
that my heart is quantitatively even more complex (in any
sense one wishes to give that word) than the flying bird's
heart does not mean new physical principles are being
brought into play; only the same old principles in
different degrees.
 I expect Mr. Dawkins would agree with all that; but then
he must stick to it. If, as on p.11, he would get bored and
irritated with an engineer's description of "the whole"
workings of a locomotive "being more than the sum of its
parts", then I think we're more than justified in
constantly checking to make sure that Mr. Dawkins isn't
trying to do the same thing, either here or in future
chapters of the book.
 p.13, "The nonexistent reductionist--the sort that
everybody is against, but who exists only in their
imaginations--tries to explain complicated things
directly in terms of the _smallest_ parts, even, in some
extreme versions of the myth, as the _sum_ of the parts!"
[italics his]
 My; I wonder if I count as a mythical nonexistent "baby-
eating" (his phrase later) reductionist if I trace his use
of the general principles involved down to the sum of the
parts! I suppose he'd better try to make this procedure
look ridiculous now, becaues it's going to cause him
problems later. Meanwhile, he apparently gets bored when
people talk about something being _more_ than the sum of
its parts, and annoyed when people talk about it being
only the sum of the parts. But there are times when
checking the general properties of the sums of the parts

can lead to some worthwhile insights. And, if I recall
correctly, it was Mr. Dawkins who originally brought up the
whole subject of the consideration of parts. In fact, he
intends to use this principle when it benefits him, and to
abandon it when it might start to work against him.
 p.13, "It goes without saying... that the kinds of
explanations which are suitable at high levels in the
hierarchy are quite different from the kinds of
explanations which are suitable at the lower levels."
 And thus the door is opened: it's all right if he
introduces properties as real which do not really exist
even in principle at lower levels, because the kinds of
explanation are "quite different." Somehow I doubt he'd
accept this procedure from a theist. I suppose if _he's_
going to explain the behavior of complicated things "in
terms of interactions between its component parts,
considered as successive layers of an orderly hierarchy"
[p.13], he'd better make sure that anyone who tries to
actually do this on the _other_ side can't get far enough
to blow the gaffe.
 p.14 "A complicated object... could not have come into
existence in a single act of chance."
 Presumably, Mont Blanc as a non-complex object (under Mr.
Dawkins' theory) _could_ have come into existence in a
single act of chance. Maybe it's just as well he doesn't
reference Hume's work on probability.
 p.14 "Just as 'big-step reductionism' cannot work as an
explanation of mechanism, and must be replaced by a series
of small step-by-step peelings down through the hierarchy,
so we can't explain a complex thing as _originating_ [his
italics] in a single step. We must again resort to a series
of small steps, this time arranged sequentially in time."
 All righty then, as we say in the backwoods. But fair's
fair; _I_ also get to analyze it in a series of small
steps. (In fact, I'd insist on it anyway, but it helps that
he's willing to do the same on his side. Makes any future--
or past--attempts at stopping that on my side look rather
specious.)
 p.14 "The fundamental original units that we need to
postulate, in order to understand the coming into existence
of everything, either consist in literally nothing (to some
physicists), or (according to other physicists) they are
units of the utmost complexity, far too simple to need
anything so grand as deliberate Creation."
 Translation: physicists either have a theory about
simplest units that violates basic logical premises, and
thus has no grounds for validity (from nothing comes

nothing); or they have another set of theories which postulate original units of something (actually it's a bit unclear whether it's supposed to be matter, energy, plasma, or some other state, but I don't hold that against it) which are too simple to have needed creation by God. Is this last bit a biological or physical conclusion?

 No, no, a thousand times no. Please, do not let this fool you, reader; this last part is a bald philosophical assertion (not even a philosophical _conclusion_) dressed up to look like the results of scientific calculation or study. It's pretty obvious that Mr. Dawkins has taken his (fully justified) awe of the grandeur of nature's complexity, and essentially decided that if he were God, he wouldn't start Creation with something as simple as what most of the physicists are claiming, because it isn't "grand" enough. This is despite the fact that (on any view) _his_ high and noble opinion, and appreciation, of nature does _not_ suffer from the fact that it _also_ proceeded from next-to-nothing (I won't say "or from nothing", because that's logical nonsense of a different sort, wherein some physicists want to have their cake and eat it, too.) I don't even know any fundamentalists who posit that God, if He exists, _MUST_ have created the universe at the type of organization which it now resides at. If they do, they are utterly ignoring the progression of organization presented in Genesis 1. And despite what Mr. Dawkins has allowed for theists so far, there are quite a few of us who, like St. Jerome (the guy who was in charge of translating the Greek texts into Vulgate Latin about 1700 years ago), recognize that the events in Genesis are presented in the form of a folk-tale.

 Did the people who contributed the glorious blurbs on the back and inside front pages actually _read_ TBW? What was the Royal Society of Literature thinking?? Here is a man who, practically in the same breath, _without even inserting anything except a comma between the propositions_, asserts that units with "utmost complexity" are nevertheless "far too simple" to require designing! The mere fact that an author dared to seriously suggest that _anything_ with "utmost complexity" was "far too simple" for _anything_ should have left them gasping with laughter, and using the sentence as an example of sublime fatuity. ('Bob, wait until you see what this bloke submitted today for our consideration!') When Mr. Dawkins accuses potential objectors back on pp. 10-11 of being naive if they treat a bird purely as a lump of matter without considering the components' various states, what shall I say to this?

  p.15 "The biologist's problem is the problem of complexity. The biologist tries to explain the workings, and the coming into existence, of complex things, in terms of simpler things. He can regard his task as done when he has arrived at entities so simple that they can safely be handed over to physicists."

  Sounds pretty much like my discussion concerning where the difference comes in between the moon's 'work' and the 'work' of any of a number of different levels in a biological organism. At least our procedure is generally the same.

  p 15, "The kind of explanation we come up with must not contradict the laws of physics. Indeed, it will make use of the laws of physics, and nothing more than the laws of physics."

  I guess we'll see; but at this point I think I'm pretty justified at being suspicious about the next remark:

  p 15, "But it will deploy the laws of physics in a special way that is not ordinarily discussed in physics textbooks."

  It is always possible to deploy the laws of physics in ways not discussed explicitly in physics textbooks. Not all of those ways are in actual accordance with the laws of physics, though. Doubtless we'll get back to this in later chapters. (Also, in the background, is the hidden implication that supernatural action would contradict the laws of physics; which is a huge misimpression, but it's not time to deal with that, yet.)

  p 15, "Meanwhile I want to follow Paley in emphasizing the magnitude of the problem that our explanation faces, the sheer hugeness of biological complexity and the beauty and elegance of biological design."

  "Design" being meant analogically, of course. I really don't see yet where Mr. Dawkins' explanation faces any kind of a "problem" in the "beauty and elegance" of nature. Maybe he's going to consider later the proposition that beings wholly derived from non-sentient components would be unconscious of beauty and elegance (or for that matter of anything else)? That would be fair game.

  And frankly I strongly suspect that the "sheer magnitude" is going to be less of a hurdle to be gotten over than a convenient and necessary smokescreen to conceal bait-n-switches. We'll see. The important thing for the reader, at this point, is not to let an otherwise noble appreciation for Nature's beauty and grandeur lead you into the state where any charge of tampering seems a "violation" because you feel nature is so "elegant" or "beautiful" by itself.

That would be a position based on a _feeling_, similar to my awe in a cathedral (or for that matter in a mountain forest) as grounds _for_ the existence of God--which Mr. Dawkins would quite rightly cut off at the knees. And it would also be a misunderstanding of how supernaturalists think God relates to nature. We'll be getting back to that eventually.

 pp 16-18, Mr. Dawkins concludes his first chapter by giving us a rather interesting look (so to speak) at the structure of the human eye (at least, I presume that's what it is--he's not specific), including electron-microscopic renderings, diagrams, etc. This includes a brief but highly illuminating (so to speak) discussion of how the back of the eye gathers photonic impulses, and what it does with them, including the resolution capability, etc. For what it's worth (speaking as a biology-layman), it seems very cogent and well-put. Mr. Dawkins does indeed do a good job of describing the scale of complexity in the eye. I thoroughly enjoyed that section, and learned several new things. That doesn't mean I'm going to forgive his flagrant disregard for logical procedure when dealing with philosophy; but it does give me some hope that I'll come away from the book with some kind of valid knowledge for my pains.

 Note: I'm sorry about the above puns, but it's hard to discuss optics without accidentally punning myself due to the way we use metaphor in language. Based on my past experiences, I suspect that Mr. Dawkins will be slurring his metaphors rather less harmlessly later. For the sake of his own argument's validity, I hope I'm wrong.

"Ramming" is as "Ramming" does;
aka, Chapter 2: Good design

p. 21, "Natural selection is the blind watchmaker, blind
because it does not see ahead, does not plan consequences,
has no purpose in view."

This is Mr. Dawkins' first sentence in this chapter, to
remind everyone of his claims about the process. Sometime
between here and the end of the book, he's going to have to
explain--without vague handwaving--how human beings
(notably, himself) managed to develop something more than
what amounts to the sum of the parts; why he can have real
purposes in view, and actively plan consequences (like his
own argument in this book, for instance) if Nature itself--
from which both he and his argument ultimately derive,
under his theory--utterly lacks these principles. Even if
he succeeds in doing this, he will still have another
massive hurdle: demonstrating how this could possibly
function as evidence that God does _not_ exist. A viable
alternative, in and of itself, does not begin to be
evidence, or argument, for a positive exclusion of the
other hypothesis.

Let me illustrate the task he has before him in a somewhat
different manner. Let us pretend that the question is
whether there are three or four properties (or
'dimensions') inherent in the world around us. Let us
further pretend that some people say there is only width,
length, and thickness and that any other supposed property
can only be a combination of those three. Let us also say
that I myself happen to agree with these people: I
disbelieve in the idea of a real fourth property of Nature,
duration. "Nature has no fourth dimension", I say.
"Duration is not an inherent property of it. And there is
nothing except this Nature, no higher reality which has
this property of duration, and therefore neither we nor
Nature can in even a limited sense derive duration from
that supernature. Only Nature, which has no duration,
exists, and we derive purely from Nature. Now," I continue,
"let me take a few minutes to explain why I think this is
so..."

At which point, half the audience is going to stand up and
leave the room, asking themselves, "If he and we only
derive from Nature, and he's asking us to believe that
Nature has no duration, where is he getting the few minutes

(i.e., the _duration_) necessary for him to explain his argument to us, and for us to hear it?" The other half will settle in to hear my explanation of how they and I manage to have enough duration to argue that Nature, from alone which we spring, has no duration. It will have to be a wonderful explanation, indeed! But I think anyone will have to admit, before hearing the argument, that at the very least there would be a wide field for potential mistakes in such an attempt!

And then, perhaps next week, I'll take a pencil and write out an argument that friction doesn't exist in Nature and yet Nature is the only field of existence. That argument, of course, will have to contain an explanation of how I managed to derive enough friction from an ultimately non-frictionable reality to hold the pencil and make graphite-marks on paper.

This is the sort of task that Mr. Dawkins has set for himself; or perhaps that he thinks has already been accomplished and which he is merely re-presenting for the sake of the people who continue to maintain that (so to speak) if we can write pencil marks on paper, friction must be an integral part of reality in one sense or another. It is indeed a formidable task; one which, if accomplished, would certainly merit recognition from, say, the Royal Society of Literature. So would a book explaining in popular terms how one can really trisect an angle using Euclidean geometry. Or, along the same principles, so would a book explaining in reasonably accessible language how application of complicated math forumlae can allow a gambler to get a winning edge against the payback-to-risk ratios used by casinos for roulette and craps tables. I even have a few of the latter; I may submit them for consideration to the RSL. They can have my copies, as I have no particular use for them.

p 21, "Yet the living results of natural selection overwhelmingly impress us... with the illusion of design and planning."

I think I can honestly agree that TBW stands as a monument to how illusions can overwhelmingly impress people. (Hey, there's a good jacket blurb for the 1999 edition!)

p 21, "[T]he purpose of this chapter is further to impress the reader with the power of the illusion of design."

Translation: 'I am here to rip away the veil of illusion! But first, let me do what I can to increase it...' (He actually says something like this at the bottom of page xiii, in his Preface: "[O]ne of my aims in [TBW] is to convey something of the sheer wonder of biological complexity to those whose eyes have not been opened to it. But having built up the mystery, my other main aim is to remove it again by explaining the solution.")

p 21, "We... shall conclude that, when it comes to complexity and beauty of design, Paley hardly even began to state the case."

I suppose I have to agree that Mr. Dawkins' veil of illusion is more complete than Paley's. Keep sharp, dear reader, for when someone begins by attempting to increase your awe of something he himself keeps stating is purely illusion, there are _several_ possible reasons why he would try this--not all of which lead to clearer thinking about the subject.

p 21, "It is not necessary to suppose that the design of a body or organ is the _best_ that an engineer could conceive of. Often the best that one engineer can do is, in any case, exceeded by the best that another engineer can do, especially another who lives later in the history of technology."

One might wonder why Mr. Dawkins hasn't felt obligated to apply that line of reasoning to theologies developed hundreds of years ago and not largely in use by philosophers today: 'Well, okay, Paley's ideas don't pan out--as Pascal noted back in the early 1600s--so I'd better check to see if modern theologians haven't exceeded him... Now where should I go to check this out? The naive backwoodsmen?' (Hidnsight note: he does get back to this complaint, sort of, on p 37.)

p 21, "In Chapter 1 we bothered ourselves mostly with philosophical aspects."

Translation: 'So in this chapter we'll be introducing them in disguise where appropriate.' For example, his earlier discussion in this same paragraph sets up a hidden argument along the lines of 'If God exists, He'd've made bats perfect the first time, so they wouldn't have to improve.'

I expect we'll be seeing this explicitly later. It'll be interesting to see whether he bothers to develop this as a conclusion or merely asserts it axiomatically. In either case, I'll have comments if the time comes. (Hindsight note: he never explicitly tries this argument, but he implies it some more, for instance concerning the 'monstrous' shape of a flatfish.)

p 22, "It is probable, by the way, that the nocturnal trades go way back in the ancestry of all us mammals. In the time when the dinosaurs dominated the daytime economy, our mammalian ancestors probably only managed to survive at all because they found ways of scraping a living at night. Only after the mysterious mass extinction of the dinosaurs about 65 million years ago were our ancestors able to emerge into the daylight in any substantial numbers."

That's a pretty reasonable hypothesis, actually. One now has to check the mammalian skeletons we have from the 65 million year mark (or earlier, of course) and see whether the positions and shapes of the eye cavities lend objective weight to the hypothesis. For all I know this has been done already and Mr. Dawkins is simply reporting the final analysis; but either way it's a good idea. Makes good 'a priori' sense. He's going to tack inept philosophical logic onto this sort of thing later, but that doesn't make the biology less sensible (any more than the biology makes the philosophy more sensible.)

p 23, "It seems to be the case that, with the possible exception of some weird deep-sea fish, no animal apart from man uses manufactured light to find its way about."

Still more good biology up to this point. In passing, though Mr. Dawkins doesn't mention it, my own opinion is that the bioluminescence of deep-sea animals (fish included) probably works for them because _everyone_ (or almost everyone) has it. In other words, each fish is seeing almost entirely by the light of his neighbors, not by his own light; and in fact most of what he sees turns out to _be_ his neighbors!

p 23, "The sensation of 'facial vision', it turns out, really goes in through the ears... although the sensation may be _referred_ to the front of the face." [italics his, slight resequencing of sentences]

By the way, if you want to try out the effect he's referring to, close your eyes and tell a friend to slowly bring his finger toward your forehead. (It'll work with your finger, too, but this method seems surer.) This is not an example of hearing the finger, as far as I can tell, but it does tend to bring on the 'facial vision' sensory effect which is also produced by the rudimentary echolocation Mr. Dawkins described. I discovered this myself many years ago in high-school band while waiting for some brass players to figure out how to count a particularly thorny four-measure sequence. (Well, it was something to do...)

p 23, "It is as though we were to speak of dogs, lions, weasels, bears, hyenas, pandas and otters all in one break, just because they are carnivores."

There's some interesting biological knowledge; I had been under the impression that pandas were herbivores and lived primarily on bamboo shoots. Maybe he means the little red ones? (The ones that are more like American racoons?)

p 24, "All other things being equal, therefore, a missle that used echoes as a guidance system would ideally produce very high-pitched sounds."

In fact, he's right: sonar-guided torpedoes do use very high-pitched sounds. And when the time comes for radar sets to guide missles, we turn to narrow, high-frequency bands of radio or microwave energy. They don't start out that way when we're just looking, because it is energy-inefficient to pump high frequencies all over large areas of sky; and even so, radars still search in a sweep pattern because of that limitation. Also see Mr. Dawkins' remarks on the difference between a bat's 'search' mode and 'guide' mode at the bottom of p 25, through the top of p 27.

p 29, "The [sound waves of a siren] can't be seen, because they are waves of air pressure. If they could be seen they would resemble the concentric circles spreading outwards when we throw pebbles into the middle of a still pond."

Another bit of an aside: explosive concussion, is, in fact, visible at sufficient strength in a ghostly sort of way-- the air at the wavefront is compressed to about the density of steel. This plays numerous atmospheric tricks and the result is that you can actually see the soundwave. Movie special effects wizards occasionally represent this effect.

Two popular movies where you can see this represented are
Die Hard With A Vengeance (near the end when a ship
explodes), and _Clear And Present Danger_ (about halfway
through the movie when a smart-bomb is dropped on a house.)
Check those out, and you can see the usually-invisible
effect Mr. Dawkins is describing.

p 33, "There is a well-known paper by the philosopher
Thomas Nagel called, 'What is it like to be a bat?'. The
paper is not so much about bats as about the philosophical
problem of imagining what it is 'like' to be anything we
are not."

This is why we must rely on metaphorical representation in
language and in our thinking processes. This often leads to
faulty 'pictures' about reality, but the faulty pictures
aren't always un-useful. For example, the mental images you
(or anyone else) have when you think of '93 million miles'
are simply woefully inadequate to representing the reality
of that distance; but that doesn't stop you from
considering the key underlying truths of the concept '93
million miles', and making use of those truths (in math
calculations for instance.)

I note this because it may be worth recalling later if (or
when) Mr. Dawkins begins to make fun of Scriptural imagery.
For instance, what amount to the 'scientific' details (as
we'd call them today) in the Creation story of Genesis are
completely fair game for scientific correction or
amplification. But that doesn't mean that the non-
scientific elements of the story (God existed 'before'
Nature; all of Nature, Man included, was invented and
called into being by Him; and Man has a resemblence of some
kind to God) can be disposed of by correction of the
scientific details. The attempt to maintain this is a
common category error among some (though not all) atheistic
philosophers.

On the other hand, a common error among some well-meaning
theologians is to start treating as metaphors, events which
may (by their character and contexts) be treated as
literal. For example, I have no problem accepting that the
Christian Ascension _imagery_ is metaphorical; because if
the event happened then by definition of the kind of event
it claims to be, it probably wouldn't translate properly
into the minds of the people who saw it and tried to tell
others about it. They would have to do the best they could

under the circumstances, and the imagery we have gets the
point across to people of all stations. But I don't think
an event like the Virgin Birth falls into the same
category. If a theologian claims this is metaphorical, then
he either means, "Something which transcends our ability to
fully picture actually happened, and the best we can come
up with for a description is to say that Mary had a baby
without having sex", or he means, "Everyone understood
Jesus was an important guy and so they wanted to highlight
his importance by talking _as if_ his mother had borne him
without having sex." The second interpretation means it's
only a symbol, that the reality is less than the imagery
(this theologian would mean that the Virgin Birth didn't
actually happen); but that's not how we really use
metaphor. The first interpretation means that something
much more articulated and concrete happened than the Virgin
Birth. I agree; it's called the Incarnation. But nothing
I've ever read about a real Incarnation functionally
excludes the proposition that Mary gave birth without sex.
The real God doesn't live in a local sky-palace, so Jesus
couldn't actually have ended up there (although it wouldn't
surprise me if He allowed the witnesses to see that, so
they'd have an understandable story to tell.) But if God is
putting Himself into the play (so to speak), that action
doesn't functionally exclude the Virgin Birth from being a
literal event. Depending on how deep we considering the
theology, a literal Virgin Birth might even be a logical
necessity. But this is way beyond the scope of my book. My
purpose at this point is only to warn against simplified
all-or-nothing answers regarding metaphor and Scripture.

Metaphors, properly used, aren't 'vague' in the least,
until we start deconstructing them. Then they start to look
like shabby vessels for the truths they were communicating;
like (for instance) what happens if we start analysing what
I could possibly mean by "looking like shabby vessels for
truths." Until that happens, virtually any English speaker
will basically understand what I mean by that phrase (or
what I mean by "understands".)

I suspect Mr. Dawkins may not fully understand how
metaphors work, though. Check the following sentences:

p 35, "Perhaps male bats have body surfaces that are subtly
textured so that the echoes that bounce off them are
perceived by females as gorgeously coloured, the sound
equivalent of the nuptial plumage of a bird of paradise.

I don't mean this just as some vague metaphor. It is
possible that the subjective perception experienced by a
female bat when she perceives a male really is, say, bright
red..." [italics mine]

Now, what does Mr. Dawkins mean by the sentence I've
italicized? Well, he means that in the first sentence he's
trying to describe something literally, not by
substitutional imagery; and that's okay. But if he _had_
been trying to give us an idea about how the female bat
perceived the male, by using imagery which he knew (or
strongly suspected) the female bat wasn't 'really'
perceiving--in other words, translating the experience over
to something more familiar to us--would it have been a
particularly _vague_ use of metaphor? It doesn't seem so to
me; it looks to me as though it would have conveyed its
information very well. In fact, it would have done such a
great job as a metaphor that Mr. Dawkins has to explicitly
correct us before we draw the wrong conclusion, by noting
he's _not_ trying to be metaphorical here! Surely that sort
of efficiency is the reverse of "just some vague" anything!
So why does he use that phrase?

pp 35-36, The analogical description of how
echolocationistic bat-scientists would describe their
discovery of our principles of sight is very funny, and a
good way to end this section. It's also an extended (and
very effective) analogical representational summary of much
of what Mr. Dawkins has been presenting since page 22.

p 36, "The bat should be thought of as analogous to the
police radar trapping _instrument_..." [his italics]

No problems there, either. (Hindsight note: flag this
section, though; I'll be referring back to it with some
frequency.) Later on the page, Mr. Dawkins notes explicitly
that a human has a conscious brain; obviously there's a key
difference of some sort between us and the bat-as-an-
instrument. What Mr. Dawkins actually says is that we have
"a sophisticated conscious brain", which may give us a clue
that he thinks extra complications (i.e., 'sophistication')
can get that otherwise-frictionless pencil to develop
friction. Hypercomplication is a common refrain of
philosophical naturalists, but we'll have to wait until
later to consider its credentials.

pp 36-37, "Our experience of electronic technology prepares us to accept the idea that unconscious machinery can behave as if it understands complex mathematical ideas."

In biology, this is called "instinct". Please note that 'behavior as if from reason' is explicitly separate from 'behavior from reason'. Mr. Dawkins himself goes to a great deal of effort to separate the two concepts so that we won't accidentally confuse them and imagine that the bat, for instance, is thinking all this out for itself. Keep this in mind: because later he's going to try to slur those two concepts back over one way or another when the separation starts to get inconvenient for him. (Hindsight note: actually, I'm wrong here--he simply ignores the issue!)

p 37, "[O]ur experience of technology also prepares us to see the mind of a conscious and purposeful designer in the genesis of sophisticated machinery. It is this... intuition that is wrong in the case of living machinery. In the case of living machinery, the 'designer' is unconscious natural selection, the blind watchmaker."

Note that he's still ignoring the fact that some people for over 6000 years have considered God no less the Creator of unliving entities (like mountains or oceans); and have considered Him Creator of unliving Natural machinery (like the solar system and its components) for as long as we've been able to think in those terms. This is not particularly damaging to his argument in the long run (flagrantly circular argumentation is a far worse crime which he's committed already), but it does demonstrate that he's got something of a blind spot. It's probably due to the fact that ever since we discovered biological life to be more complicated than our unliving environment (taking situations in abstraction), the proponents of the AfD have used biology more than physics. You can see the switch being made in the early 1600s, when after using the solar system's 'design' and microscopic detail 'design' as fuel for the AfD, they start going to biology. He's a biologist, so he's going to cover his 'territory', so to speak. But please keep in mind that he's being (perhaps unintentionally, here) restrictive in scope.

Also note that at this point we still don't have one iota of argument or experimental evidence that we and the bats are definitely products of unconscious natural selection

and no other force. The statement above is pure assertion.
It's not as bad as a purely _axiomatic_ assertion (e.g.,
requiring the condition that God not exist as a key premise
in the definition of a term he intends to use to show that
God doesn't exist, which he did back in Chapter 1), but
don't let him bluff you into thinking he's gotten further
than he has.

p 37, "I hope that the reader is as awestruck as I am, and
as William Paley would have been, by these bat stories."

After all, an awestruck person is likely to be less
critical and have lower sales-resistance; something Mr.
Dawkins himself points out when he writes:

p 37, "Paley rammed home his argument by multiplying his
examples. [...] In many ways I should like to do the
same... But there is really no need to multiply examples.
One or two will do... [I]f Paley's explanation for any one
of his examples was wrong we can't make it right by
multiplying up [sic?] examples."

Of course, as he stated at the start of the chapter, he
fully intended to produce the exact same sort of awe in the
reader by describing in exhaustive detail the workings of
bat-biotechnology. "Ramming home" is as "ramming home"
does. We'll see how fun this standard is later when it
comes time to examine the various complex levels of the
human organism. If Mr. Dawkins' explanation for one of
those levels (e.g., the level which allows him to reason
independently enough to even try arguing) is fundamentally
contradictory, he _also_ cannot make it right by
"multiplying up examples."

Meanwhile, just for kicks, everyone go back to Chapter 1
for a moment and try to guess why Mr. Dawkins explicitly
intends to get worked up ("in my nonprofessional life")
about people boiling lobsters alive. This is the same man
who insists that we consider the bat as an unconscious
instrument. He doesn't say back in Chapter 1 something to
the effect of, 'And yes, I know it's easy to get tricked
into considering these things as more than complicated
natural machinery--heck, I often find myself getting upset
over boiling lobsters alive until I come to my senses--but
we have to get past that.' No, he is "quite prepared to get
worked up" about that sort of thing. This implies he holds
a very solidly conscious opinion beforehand against the

idea of lobsters being boiled alive, and is ready to argue
against boiling them alive. (Go back and read the contexts
around the remark. It has to do with the use of words; the
biological/biophilosophical state of lobsters is simply
assumed. It's near the top of p 2.) Maybe it's because
boiling lobsters alive ruins the flavor? Possible, I admit,
but highly improbable--that would be so unusual it seems
very unlikely he wouldn't have included it. Because boiling
them alive releases a poison into the lobster's system and
he thinks people ought to know about that? (This is a
fictional example.) No, that would fall pretty squarely
into his "professional life". Because it hurts the lobster
and he doesn't think it fair that the lobster should
suffer? That would mean he thinks lobsters should not be
classified with bats as unconscious natural instruments.
"'Tis a Puzzlement!" as Yul Brynner says in _The King and
I_.

p 37, Next up, Hugh Montefiore (Bishop of Birmingham in
1985) and _The Probability of God_ is raised up to replace
the charred remains of Paley with a new straw man. Well, at
least Mr. Dawkins is broadening his range a little bit.
He's not relying on extremely out-of-date variations of the
AfD; he's willing to find modern proponents of it and treat
them as if they were the sum of the creationistic
theist's position. And he didn't find this one in the
backwoods! Very impressive. I have no experience whatsoever
with Montefiore's _TPoG_, so I'll let it hang and burn; as
Mr. Dawkins himself basically points out, the AfD is the
AfD, and I have no intention of trying to defend its use as
primary argument in favor of God's existence (assuming this
is in fact what Montefiore was trying. Someone familiar
with the strengths of his work, if any, may wish to
contribute here.)

To be fair, Mr. Dawkins notes that parts of the Bishop's
book are about physics and cosmology, and that the Bishop
appears to have referred to real physicists, _and_ that Mr.
Dawkins does not believe himself competent to comment on
them. That isn't going to stop him from essentially
concluding that if the Bishop was wrong about natural
selection, nothing else the Bishop proposes will work; but
it is a commendable admission.

p 38, "Unfortunately, [the Bishop, when it came time to
refer to biologists] preferred here to consult the works of

Arthur Koestler, Fred Hoyle, Gordon Rattray-Taylor and Karl
Popper!"

Gasp! What a terribly unwise thing to do! Because... um...
well, I guess Mr. Dawkins will bring us back to that later?
Moving right along:

p 38, "The Bishop believes in evolution, but cannot believe
that natural selection is an adequate explanation for the
course evolution has taken (partly because, like many
others, he sadly misunderstands natural selection to be
'random' and 'meaningless')."

Maybe those other roguish gentlemen included phrases in
their work like, "Natural selection does not see ahead,
does not plan consequences, has no purpose in view," or
"Natural selection, the blind, unconscious, automatic
process... which we now know is the explanation for the
existence and apparently purposeful form of all life, has
no purpose in mind. It has no mind, and no mind's eye." I
think phrases like that would easily lead someone to
conclude that philosophical evolutionism posits an
ultimately meaningless universe. At least, the error would
be very forgivable and any sad misunderstandings on the
part of the Bishop would be quite probably the fault of
those cads, who doubtless inserted those phrases into Mr.
Dawkins' own book on pages 21 and 5 respectively.
Fortunately, Mr. Dawkins intends to explain how we humans,
utterly dependent on a purely non-rational nature, can
nevertheless get real meaning out of the universe anyway:
real objective meaning, not subjective the-meaning-exists-
only-because-you-do perceptions. Of course, everyone
agrees--including Mr. Dawkins--that we can (at least
potentially in any given situation) apprehend real meaning
and that real meanings must exist; otherwise he'd not
bother trying to _argue_ his points. He has certainly set
himself a task, though. ('Now, let me take a few minutes to
explain why duration is not a basic characteristic of
reality...')

p 38, "[The Bishop] makes heavy use of what may be called
the Argument from Personal Incredulity... an extemely weak
argument, as Darwin himself noted."

Actually, this is not only funny but a useful turn of
phrase. Mr. Dawkins effectively (I can't say "fairly"
because I don't know the work in question) reduces the main

problem with one of the Bishop's chapters to a form which
can be easily seen to be faulty. It will be equally amusing
if Mr. Dawkins eventually uses, explicitly or implicitly,
the AfPI himself.

Come to think of it, perhaps he's done this already back in
chapter one, where he obliquely implies that the posited
particles physicists think the universe emerged from, are
(despite their "utmost complexity") too simple to be God's
creation. His lampoon of the Bishop's opinion of polar-bear
color could be retranslated: 'I personally, off the top of
my head sitting in my study, not being omniscient and the
rest of it, never having created a real universe from
scratch for any purpose whatsoever, and having been
educated in natural science and maybe computer science,
think that near-Big Bang subatomic matter isn't grand
enough to need an intentional Creation.' But maybe we'll
see a more explicit example later.

p 39, "Even if the foremost authority in the world can't
explain some remarkable biological phenomenon, this doesn't
mean that it is inexplicable."

Actually, I agree with that. Works the same way with
historical analysis, too. For instance, there were a ton of
unsubstantiated historical markers in the New Testament
accounts, but over the years they've continued to be
discovered and verified, to the point where the vast
majority of them can be considered historically reliable.
(When I say 'historical markers', I mean the sort of thing
one might also find in Josephus or a similar historian; I
don't mean the miracles, though historical markers tied to
stories of miracles are being constantly verified.) On the
other hand, if the foremost authority in the world can't
explain a posited biological phenomenon because it's a
contradiction in terms, then it really _is_ inexplicable--
and even unusable--as long as those terms remain.

Turning back to Scripture, it's probably a contradiction in
terms to say that Jesus tossed the moneychangers out of the
Temple twice. (In the Synoptics--Matthew, Mark and Luke--he
does it at the start of his final week alive. In John, he
does it at the start of his ministry.) If something like
that had happened twice, the narrators probably would have
mentioned it (like they explicitly do for the two mass
feedings--note, it doesn't matter whether you think Jesus
really fed them or not. It's the principle of narrative

emphasis which I'm trying to illustrate here.) I might
solve the problem by noting that Matthew, Mark and Luke all
tend to work according to the gameplan of similar ancient
historians whom we accept as reliable, which means that
chronology was less important to them than the underlying
meaning of the event; and that John appears to write more
to the standards of modern historians. But I can't at the
same time maintain that the Gospels are 100% literally
factual. I have to change the terms to live with the data,
and I have to be ready to deal with the consequences of the
change. (In this case I don't think the real consequences
are that problematic; but to a fundamentalist brought up to
believe, in essence, that the Bible is God, it could be
devestating. For what it's worth, Craig Blomberg presents
what I consider to be the most sensible argument in favor
that the cleansing of the Temple _did_ happen twice.)

p 39, "One form of the argument [from personal incredulity]
makes direct use of the extreme sense of wonder which we
all feel when confronted with highly complicated
machinery."

And, as Mr. Dawkins very rightly points out, this is not
grounds for believing concurrent propositions about the
machinery. This version of the AfPI isn't restricted to
theists, of course; there are tons of people (some of whom
I've met myself) who gaze up at the nightmare size of the
universe and conclude that God can't possibly care about
people as small as us (and thus Christianity, at least,
must be false). Same principle; same faulty logic. Mr.
Dawkins doesn't seem to go that route (at least, he hasn't
yet); but the reader should be aware that that argument
doesn't work, either.

Mr. Dawkins concludes the chapter on pages 40 and 41 with a
pretty fair and useful description of the amount of time
we're talking about to get these changes from thing-to-
thing. It's a good way, I think, to help people get past
the concept of "Well, gee, that moth took a hundred years
just to change the shade of its... um... fur (or whatever
it is that moths have!)" We're talking about really,
really, mind-blowingly large chunks of time, folks; and
that multiplied by the number of functioning generations
of a species in a given section (or multiple given
sections) of Earth's environment. I have no problem with
this whatsoever; as far as I can tell ("off the top of my
head, sitting in my study, not having had a formal natural

science education", of course!) this is good biology. It's not good philosophy; it's not bad philosophy; it's not philosophy at all, at this point. We will have to be careful not (as Martin Luther said) "to fall off the horse on the other side", and use this gargantuan time-span to mask a fundamental switch of basic principles. But I can hardly deny it exists and helps provide, biologically speaking, for evolution's plausibility.

And, I think Mr. Dawkins is right in correcting the impression of 'randomness' which gets brought up a lot regarding evolutionary theory. There are determinate factors which help restrict and 'focus', so to speak, the process. Of course, I think one of those determinate factors is God. But physically (and not philosophically speaking) there's the relative stability of the evironment; the absolute stability of natural laws (I've noted before that few if any creationistic theists believe God violates the stability of natural law when He, or another supernatural entity, acts--but you'll have to wait until later for me to get back to that); and other such factors which may, in a cause/effect manner, be considered 'determinate'. This helps biological evolutionary theory out quite a bit; it's not going to do anything for the philosophical part, but I can hardly help that! At any rate, I don't foresee (yet) much trouble coming down the pike from Mr. Dawkins on the subject of randomness, though there's at least one way to abuse it, too, which he may try. We'll have to wait and see.

The Wickets Get Stickier;
aka, Chapter 3: Accumulating Small Change

p 43, "We have seen that living things are too improbable
and too beautifully 'designed' to have come into existence
by chance."

Well, actually, we haven't been shown this yet in TBW.
We've been _told_ this; but it really hasn't been
demonstrated yet. At the same time, some concepts
regarding perceptions of order and assumptions of order are
going to crop up in this chapter, among many other things.
You may wish to begin by asking yourself, "By what standard
is Mr. Dawkins judging that something is 'designed' too
'beautifully' to have come into existence by pure chance?"
Also, "What is the difference between the methodology of
this remark and a religious use of the AfD?"

More importantly, I believe there is a profound misuse of
the concept of probability in the above sentence. "Living
things are too improbable... to have come into existence by
chance." Improbable compared to what? Such an event is an
integral part of the entire history of the physical
universe (which is all that exists, according to Mr.
Dawkins). This 'history' has only happened once, and so a
hindsight prediction of its probability or improbability
can't be stated. That only works when we have a frame of
reference, multiple examples, and a prior thorough
knowledge of the principles of the system. I know this is a
complicated criticism, so let me try illustrating it like
so:

It is impossible to predict beforehand whether a tossed
coin will land heads or tails (assuming it's an 'honest
coin'--a rather big assumption, actually!) It is
functionally possible to predict that a coin tossed 1
billion times will have a roughly equal number of head/tail
results. If we got instead, say, a 90% heads rate, we'd
know that this is an improbable result and might then be
suspicious about the validity of the test (or perhaps the
honesty of the coin-tosser!) But the result is, of course,
still possible. The problem is that we know it to be
improbable only because we are outside the system of the
tossed coin in some fashion and have a reliable standard
(our pretty thorough knowledge of the mechanics of coin-
tossing and the nature of the coin) to _BEGIN_ with. That

is the premise _upon which_ we are basing our judgments
about the results of the coin toss.

But if, as Mr. Dawkins would have us believe, we are in no
way, shape, form or fashion separate from the physical
universe, how then can we plausibly draw inferences about
what is probable or improbable inside it? We may look at a
subsytem of the total nature, like the tossing coin (though
the fact we recognize it as a 'subsystem' and can form a
conception of this is itself very suspcious!), but can we
generalize an inference from it to the total system's
behavior? What grounds do we have for supposing that the
total system actually resembles the subsystem? We can't
say, 'Well, we've stood outside the normal physical system
enough to see that the result is improbable.' First,
according to Mr. Dawkins, we don't stand outside the
system. Second, even if we did, we've only seen the
universe's history 'tossed' once, so to speak. If I see it
tossed once and it comes up tails, how do I call that
improbable?

You might reply that I have misled you by talking of the
coin as a subsystem at all; it is one facet of the single
basic system itself, and so by discovering how it 'behaves'
(metaphorically speaking) we are getting a reliable
indicator of some intrinsic property of the system as a
whole. It would be rather like a pinprick through a piece
of cardboard, which can allow someone to see, via the sun's
rays through the pinprick onto another piece of cardboard,
an eclipse taking place.

But this is not an argument an atheistic naturalist can
hold to; for if that were true then our own reason (which
must be assumed to exist, else even Mr. Dawkins' arguments
can never get off the ground) would be, in just the same
way, one facet of the single basic system which gives us a
reliable evidence of some property of the whole! In other
words, following _that_ line of thought, we suddenly arrive
at either a pantheism or a theism! Mr. Dawkins then has a
rather unpalatable choice of options before him: a.)
recognize that he is surriptiously assuming a certain bent
to reality (atheistic naturalism) _upon which_ he is making
his judgments and, therefore, something which he then
cannot be said to be proving or probabilistically
estimating; b.) recognize that he's actually talking about
a pantheism or theism if he applies the existence of his
own reasoning ability to the principle; or, c.) abandon the

concept of probability altogether, whereupon the argument he advances in this book is fatally crippled.

I realize this has been a rather complicated objection. It is part of a considerably longer look at the philosophical implications of our application and perception of 'probability'. I have actually had to shorten and condense it a great deal, and I expect there are holes in its presentation. I can only ask the reader to do the 'logical math' for yourself, and try to follow it out beyond the beginning I have made. Hopefully I'll be able to illustrate it better as Mr. Dawkins continues through his argument, by looking at how he uses probability and what the actual implications are if we follow through with it.

I should also point out in passing that, even if I were to jettison my argument above, the contention "Living things are **too improbable**... to have come into existence **by chance**" [italics mine] includes a contradictory intent. Something which cannot come into existence by chance has a _zero_ probability. The probability does not exist. Something which is grotesquely improbable is still possible. And, in fact, Mr. Dawkins will be illustrating later that these things which are "too improbable" to have come into existence by chance still came into existence by "accident", "automatically", and "randomly"--in other words, _by chance_. Basically he's defining "chance" to mean anything he wants at the moment.

p 43, "The answer, Darwin's answer [to how living things came into existence], is by gradual, step-by-step transformations from simple beginnings, from primordial entities sufficiently simple to have come into existence by chance... The cumulative process is directed by nonrandom survival. The purpose of this chapter is to demonstrate the power of this _cumulative selection_ as a fundamentally nonrandom process." [italics his]

The only real problem I see about this, is that nonliving situations or entities _also_ come into existence due partly to nonrandom factors. I'm not really sure yet why Mr. Dawkins is so determined (bad pun!) not to acknowledge this; I would have thought if anything it would make his biology stronger. But I suspect (though I haven't seen it yet) that this will end up as a smokescreening disparity: perhaps when the time comes, he'll be able to point to a (non-existent) difference between living and non-living

things (e.g., non-living things may exist as results of
pure random reactions, but living things exist thanks to a
combination of random and nonrandom factors) as a means of
getting around some questions of causation which will start
undercutting his argument eventually. Mr. Dawkins himself
bears witness, obliquely, to the mixture of
random/nonrandom influences which make up a non-living
event in the next paragraph.

In it, we have a situation where on a pebbly beach, we find
pebbles not arranged at random (as he explicitly admits).
The pebbles have been sorted by weight (and perhaps by
hydrodynamic shape) according to the generally constant
force (for each pebble) applied by the crashing waves as
the pebbles are water-tossed. As he says, "[The waves] just
energetically throw the pebbles around, and big pebbles and
small pebbles respond differently to this treatment so they
end up at different levels of the beach." But this is
certainly very far from demonstrating that simple, non-
living situations or events occur purely on random chance.
There are nonrandom factors involved; the weight of the
stones, the more-or-less constant force of the waves
averaged over time (the range of power is probably a
constant, though the power at any given moment certainly
varies some). Much of this has been determined by nonrandom
properties. And in fact, this brings us to a concept which
I'm not sure whether Mr. Dawkins is going to apply fairly
and continuously (though I suspect he'll use it), but which
is going to cause him trouble in the long run.

The problem is this: randomism is just as deterministic as
nonrandomism. Go back and check the tossed coin. Though the
result may be functionally random (assuming--big
assumption!--no one is fiddling with the experiment), the
result is _no less_ determined. One can put it
mathematically and say that the coin has a 'range' (heads
or tails) instead of a constant (only heads). But the
result _will be determined_ within the range. The range
itself _is_ constant (it can be either head or tails but
not both and not neither.) The power of the waves in the
above example will probably be different in strength with
every 'slap' on the beach; but at any given moment there is
a functional range which limits the options. The range is,
itself, a determinate characteristic. (It's 'a range' not
'a constant', and has 'these' consequent properties and not
'those', so we may expect 'this set' of results and not
'that'.)

I realize a lot of readers are going to say, 'So what?' But the point, though subtle, has rather momentuous consequences for any future claims which can be made for 'randomism'. I don't know whether Mr. Dawkins intends to try it or not, but there are naturalists who attempt to use the property of randomness as a full explanation for why we can contribute something which is not only a reaction to our environment and local physical states. This is important, because absolute determinism is a self-contradictory idea. To put it very simply, 'Why should I accept your argument that absolute determinism of any sort whatsoever is true? You would have presented it whether it was true or not!' Most philosophers recognize this problem (it crops up again in religious theories of predestination, which I don't have time to get into here), and some naturalists who recognize it think that randomism provides an escape-clause for determinism. It does no such thing! A random event still determines the result of the event, and the result is still determined by the event, even if random. An event composed of nonrandom factors and random factors is still utterly determined by those factors: and that means that if every single one of those factors is something in itself non-sentient, then the result will also be non-sentient.

Again, I've had to get rather technical, and oversimplify some of my own arguments here for purposes of brevity. If and when Mr. Dawkins tries to do something like this, we'll get back to it. If not, then at least I've given you, the reader, something else to consider.

p 44 contains another two examples of how simple nonliving events or entities are the way they are, from random and nonrandom determinants. And as Mr. Dawkins says near the bottom of p 44, "Sieving of this order of simplicity is not, on its own, enough to account for the massive amounts of nonrandom order that we see in living things. Nowhere near enough."

That's true, as far as it goes, but the real question is whether the fundamental underlying principles in the simple set are functionally different from the hypercomplicated set. If not, there's no reason to treat them as if they were qualitatively different. Different results may be produced, no doubt; but they'll have the same underlying fundamental principles--and these are the ones which

eventually, in my opinion, sink the naturalist argument.
That's why the naturalist is always trying to get away from
them (except for purposes of asserting there's nothing
other than the blind, physical universe. Hindsight note:
we'll see this worked out later in one of Mr. Dawkins' own
examples.)

This also brings up the concept of order. Namely: how does
Mr. Dawkins know those rocks are in order on the beach? I
know, this is going to seem a 'duh!' question. (i.e.,
"Well, duh! Because the little rocks are next to the little
rocks and the big ones are next to the big ones.") But
notice that this is a rather subjective and arbitrary sense
of order. I and Mr. Dawkins can both assure the reader that
when we get to living creatures, the order is not of _that_
sort. Is Mr. Dawkins arbitrarily defining 'order' along
whatever lines are convenient at the moment? No, probably
not: he probably, in this chapter, means 'cohesion'. That
would be a shared characteristic between the stones and
practically any biological/organic level. But here's the
point; this whole chapter so far doesn't really match the
sort of definition he wanted us to accept for Mont Blanc's
condition earlier. It _also_ has very many types of
cohesion. It is, as far as it goes, 'ordered'; and if we
try to claim that my perception of its order is subjective,
I respond that it falls into the same class of order we're
talking about here in Chapter 3. In the long run, this may
or may not pose a problem for Mr. Dawkins (though I think
at least it means his description of Mont Blanc should be
revised to avoid confusion.) But it may be symptomatic of
something I mentioned a moment ago; an attempt to posit a
change in fundamental properties (except when that becomes
inconvenient) based on hypercomplication. Different results
may follow from the ordering of different things; but
'order' is too basic a concept in itself to allow for a
fundamental change of property by hypercomplication.

And going back just a moment to pick up some spares, please
note that we get another round of bald assertions rather
than conclusions: p 43, "We might give a superior smile at
such a superstitious person [for believing a Great Spirit
in the sky with a tidy mind and a sense of order existed],
and explain that the arranging was really done by the blind
forces of physics, in this case the action of waves." p 44,
"If we look at the planets of the solar system, lo and
behold, every single one of them is travelling at exactly
the right velocity to keep it in its stable orbit around

the Sun. A blessed miracle of providence? No, just another
natural 'seive'."

If you check these examples closely, you will see that Mr.
Dawkins brings his beliefs _to_ these examples, rather than
deriving a conclusion _from_ these examples. "Obviously
this is not evidence of conscious design", he says (p 44);
but just as obviously, it is _not_ evidence that _only_
nature is 'at work' (metaphorically speaking.) If we
already believe on other grounds that nature is all that
exists, then we might well get from these examples a better
understanding of how 'cool' nature is. If we _already_
believe on other grounds that God exists, we might well get
from these examples a better understanding of how 'cool'
God is. Mr. Dawkins, in these examples, takes the first
approach: he begins with the (unstated) presumption 'God
doesn't exist, only the mindless nature which has such-and-
such laws' and then observes that 'the facts we find happen
to fit that assertion.' Fine. It's not only fine, it's
probably necessary; but it's not an argument _in favor of_
the proposition. Otherwise, it would be just as good an
argument in favor of the existence of God!

Now, I'm not going to lean on these two little examples as
if they formed the cornerstone for Mr. Dawkins' whole
argument; I'm only using them to warn the reader once again
that Mr. Dawkins tends to heavily 'leaven the dough', so to
speak. And the first example is not a very polite
leavening. He invites the reader to smile patronizingly on
the native superstition: 'Of course,' he nudges the reader,
letting you in on the joke going over those pool deluded
people's heads, 'we know _that_ isn't true.' Well,
actually, if he's playing fair he has to _argue_ it isn't
true, and so far he's only been asserting and asserting and
asserting. When he applies to the reader's sense of
superiority (which he does again and again throughout the
book)--to the feeling of 'Aren't we better than them?'--
then though that doesn't necessarily mean he's wrong in the
end, it seems to me a rather suspicious method of getting
his point across.

Of course, he might reply, 'I only said we _might_ give a
superior smile and attribute it to blind physics.' Fine. We
just as easily might _not_, too! He doesn't mention that
only checking the results gives us no information one way
or the other for a conclusion about whether that
attribution is correct--and given his much flatter

assertions elsewhere, even in this chapter, I conclude that
he's more interested in what advertisers call 'positioning
his argument in the mind of the client'. Remember what I
said last chapter: "Ramming is as ramming does." If we are
to look down on the methodology of the religious proponents
of the AfD, why should we tolerate that methodology in
other venues and not be equally suspicious that it hides a
fallacy?

p 44, "To generate a biological molecule like
haemoglobin... by simple sieving would be equivalent to
taking all the amino-acid building blocks of haemoglobin,
jumbling them up at random, and hoping that the haemoglobin
molecule would reconstitute itself by **sheer luck.**"
[italics mine]

No, it wouldn't; by Mr. Dawkins' own description of
'sieving' just two paragraphs earlier: "Mankind has long
exploited this simple principle for generating non-
randomness, in the useful device known as the sieve." By
default--by Mr. Dawkins' own words a moment ago (back when
that nonrandom sieving process helped explain how all our
planets got where they are without God, according to Mr.
Dawkins)--the process of sieving would funnel the amino-
acid building blocks to an extent that would technically be
something other than "sheer luck", which Mr. Dawkins here
equates with "jumbling them up at random." Granted, a
simple sieving won't be nearly as effective as a process
which contains more constraints; but the point is that Mr.
Dawkins feels quite free to redefine what a concept can and
cannot do. Although not a serious problem here (simple
sieving is still extremely inadequate for getting
hemoglobin together from amino-acids in a probable amount
of time), it is symptomatic of something I mentioned
earlier: Mr. Dawkins wants something to be utterly random
on page A and then at least partly the product of nonrandom
forces on page B. This procedure can be horribly abused;
and obviously it will be up to the reader to make sure he
doesn't fudge with it. The fact he's doing it at all
doesn't bode well.

p 45, "Simple sieving, on its own, is obviously nowhere
near capable of generating the amount of order in a living
thing."

Setting aside for the moment the problem I just mentioned
(this phrase would work just as well--or not--if he

consistently acknowledged the amount of ordering sieving allows), this remark contains a rather subtle but significant category error. He's confusing impossibility with improbability. "Nowhere near capable" is _impossibility_; one out of 1x10E190 (1 with 190 zeros after it) odds against creating the haemoglobin molecule from pure luck (or sieving, whichever properties he's allowing to sieving on this page!) is _improbability_. 'Capable' means 'It can be done.' 'Nowhere near capable' means 'not only can it _not_ be done, it won't even get close.' 1:1x10E190 odds against it being done means 'Yes, it can be done.' These are two completely different concepts. I won't even get into how relatively probable we should judge those odds; check back near the start of this chapter for a discussion about that.

This may not seem like an extremely serious breach, but look at it this way: whatever philosophical theory turns out to be true (or truer than its opposition), we _are here_! Mr. Dawkins is _here_, the haemoglobin is _here_. We, and the things we discover all around us through science, are brute, opaque facts (some Eastern philosophies aside; I don't have time to deal with those at the moment.) That means that we can't explain them away; we've got to fit them as they are into the philosophies we hold, and perhaps alter our beliefs if they won't fit together. Mr. Dawkins' purposes in this book are (or should be) to argue:

a.) that it is possible for sentient creatures to develop from a basically non-sentient system; and
b.) that evidence for this also somehow serves as a positive exclusion of the other alternative--i.e., either it is impossible for sentient creatures to be developed by a basically sentient system (and notice the verb change, that's important but something for later), or that this might have been possible but it didn't happen.

Task b is going to be highly amusing to watch him try; but so far he's only asserted it. Task a is going to be almost as amusing (he hasn't really even pretended to try yet), but as long as he doesn't essentially argue that we can't really think, he might make a go of it. Mr. Dawkins also intends to work in: c.) That these things are not only possible but probable. This is a good goal because a huge amount of criticism against evolutionary theory is based on perceptions of its 'improbability'.

But as I noted at the start of this section, this is really
a moot point. This is hindsight probability, and though it
might be interesting to use a discussion of it to get a
grip on the principles of biological evolution (though
really what Mr. Dawkins will attempt is the opposite: show
how the principles properly applied make it more probable),
it's not really something he needs to be going into yet. He
has another rather serious obstacle first: to _show it's
possible_. He can't just assume it.

If my brother, Spencer, comes to me claiming to have won
the Tennessee State Lottery, should my first response be,
"Wow, what are the odds against that? Nope, too big, I
don't believe him." Or should it be, "Do we even have a
State Lottery in Tennessee?" Surely the answer is head-
slappingly obvious: one has to first figure the
possibility. And these are two different sorts of
questions.

What Mr. Dawkins appears to be starting, here, is a
discussion of whether we can whittle down the odds against
certain organic structures (namely us and the Earth's
creatures) appearing by accident, as it were. (i.e., no
active intentions because, he has _ASSUMED_, no real
Intender.) This is not the same as showing it to be
possible; the possibility has to be _assumed_ before the
question gets going. But then, so much for doing anything
ultimately useful about the question. He might (assuming he
makes no similar logical blunders in his biology) show it's
probable, assuming the possibility. But showing the
possibility is more important. If it's actually impossible
for naturalism to be true, then checking the probabilities
(which must assume the possibility) just won't cut it. He
can't even assume (though I don't know yet he's doing this)
that it's impossible to gauge the possibility, and then go
on to the probability. That's still no help.

Here's the point: we already have a clear statement showing
he's confusing possibility with probability (clearer than
my original suspicion near the start of this chapter). He's
already talking about probability before discussing
possibility. Therefore, we need to watch carefully to make
sure he doesn't intend to surriptiously switch categories
back and forth on us until we lose track of which way is
up. And remember, his final goal is beyond either
probability or possibility: Paley was "utterly, gloriously
wrong." Somehow he's got to finagle possibility and

probability into _certainty_--a third category which is not
just a fancy way of describing one of the other two.
Something may be possible and probable, and not certain (or
certain.) Something may be possible and improbable, and
certain (or not certain.) Something may be certain and
probable, or certain and _not_ probable (though it will
have to be possible first.) The logical math is pretty
clear: possibility is the key thing. Without it, one cannot
talk of either probability or certainty. If Mr. Dawkins
doesn't get back to possibility, TBW will be an utter
logical failure as regards the philosophical push it
represents--and in the process, he could take the biology
down with it.

p 45, "In cumulative selection... the results of one
sieving process are fed into a subsequent sieving, which is
fed into..., and so on." [the second ellipse is his.]

This is better; but then the solar system went through the
same process. He calls the solar system's condition a
"stable arrangement", but there was a time when it was
highly unstable. It's only "stable" now until something
messes with it. Is Mr. Dawkins saying that what makes the
difference between cumulative selection is whether the
'sievings' take place at long intervals? That would be
different from what he claimed before. And didn't he cure
us earlier of mistaking galactic periods of time as making
a fundamental difference in what happens?

p 45, "[Living things] may in practice be the only things
that [participate in cumulative selection]. But for the
moment I don't want to beg that question by saying so
outright."

Sarcastic, suspicious me: does he plan to beg that question
later by _implying_ it?? That would be par for the course
so far.

Meanwhile, speaking of hidden beggings of the question
which may crop up later: philosophical naturalists often
tend to slur over the consequences of using metaphors like
"work" and "do" and "act" and "select" and "participate"
for things which, by the naturalists' own admission, do not
initiate action but only react and counterreact to the
environment. I do NOT hold this against them; except
insofar as this often ends up being part of the smokescreen
wherein the ability to initiate action somehow develops. I

really don't think they do this on purpose: it's part of
our language to treat unconscious and reactive objects as
if they had consciousness and could initiate actions. But
it can lead to some easy confusion when the topic pops up:
'Where does _our_ ability to initiate actions come from?'
I'll have to ask the reader to keep checking, doing the
logical math, to see whether or not Mr. Dawkins tries this.
(I know, I'm asking the reader to keep tabs on a lot of
things starting this chapter. Sorry. Despite Mr. Dawkins'
rather unflattering representation, theism is not a simple
subject and the actual debates between naturalists and
supernaturalists get very technical. Part of my goal in
this book is to give the reader an idea of what it's like
to be a systematic philosopher; "Doing the Logical Math",
as I like to call it.)

p 46, "These resemblances [in clouds] come about by single-
step selection, that is to say by a single coincidence."

Um... no. What can I say? If I were a meteorologist, or a
hydrodynamics engineer, I could illustrate profusely that
it's not the result of a single coincidence. Let's continue
on to a very interesting (and much better example) of what
Mr. Dawkins is talking about; but one which isn't going to
quite make the distinction he thinks.

By the way, note that in this paragraph he tosses off how
"we" are unimpressed by what clouds look like, and how "we"
are far more impressed if a praying mantis looks like a
cluster of flowers. Well, gosh, I guess "we" had astrology
for millenia and "we" had a "much published photograph" of
a cloud that looks like Jesus--both explicit examples he
uses--because "we" were _un_-impressed with their
similarity to something else "we" cared about. Those things
must have been so pervasive for some _other_ reason than
how impressive "we" have found them. (This reason has
apparently been left to his readers as an exercise to
puzzle out.) Maybe he meant "we" _ought_ to be more
impressed with the mantis. Why? Because its similarity to a
cluster of flowers is useful? I expect that picture of
Jesus and all that astrology was useful to someone
(preachers and astrologers at least.) I've got it: "we"
should be more impressed with the mantis because its
similarity is useful to _it_! That might be objectively
defensible, and would tie in nicely to his theme that
complex objects replicate. Too bad he didn't actually say
that.

pp 46-48, Okay, NOW we get to a useful description of the
difference he proposes between single-step and cumulative
selection. It is very enlightening (though it would have
been better had he told us how many 28-letter entities the
cumulative-step program had to choose from every
'generation'. 6? 50? 3245? 203879?) Two things to notice,
though:

a.) the computer was explicitly working toward a standard
the whole time, one set up by Mr. Dawkins himself. This may
be surmountable in the long run (to be fair, I think it
will be) but at this point it's hardly a demonstration of
how "the blind forces of nature" produce "strange and
wonderful... consequences" (p 49.) It's very much more like
'how an innovative Designer with a consciously chosen
target came up with the most efficient means of reaching
that target within a general framework of rules he had
decided upon.' He's really jumping ahead a bit quickly with
this (not that he hasn't been doing that the whole book.)

b.) Let's go back to that cloud with the face of Jesus for
a moment. (I'm assuming for purposes of argument that the
resemblence to Jesus' face was completely unintentional in
the rigorous philosophical sense.) The cloud's shape is not
really a result of single-step selection under Mr. Dawkins'
example regarding the computer experiment. Check for
yourself how that experiment really proceeded. The computer
'monkey' typed 28 random letters. Then it typed 28 random
letters WITH NO LINK WHATSOEVER TO THE PREVIOUS SET! (I
realize that looks dramatic in all-caps, but I wanted to
make sure you, the reader, hadn't nodded off yet! This is
an important detail.) Okay, fine. I guess I can accept
that, as an example of single-step selection, if Mr.
Dawkins really wants that. But then, >poof< goes
practically every example of 'single-step selection' he's
given us up to now. Let's check the cloud (you can apply
this to Mont Blanc and the Solar System at your leisure.)

Let's assume that we've already reached the point where the
cloud exists. And let's even pretend, for sake of argument,
that this cloud really has reached a particular shape (but
not the Jesus shape) by a single coincidence. Now, over the
next unit of time (say, a minute), which process
illustrated by Mr. Dawkins in his computer example _REALLY_
matches what happens to the cloud? The first example--does
the cloud's shape one minute later have absolutely no link

whatsoever to its shape one minute earlier? Balderdash! If the reader wishes the technical explanation of this, I'll have to refer you to proper meteorological textbooks; meanwhile, I suggest you go out and stare at some clouds for a minute. Videotape them, if you like, and play them forward and reverse. Do they change utterly randomly from moment to moment or minute to minute? Of course not: what a cloud looks like one minute has a bearing on what it will look like in the next second or minute. (Or, more properly, the atmospheric conditions which determine the properties of the cloud are fluid and are thus integrated as a process.) The actual development of the cloud's shape is, catagorically, the same as Mr. Dawkins' cumulative-step selection. Granted, the complexity of cumulative-step selection in, say, a mantis' evolution is more complicated; but that was _not_ the _functional_ difference in Mr. Dawkins' computer example, was it?

Remember back on p 45 where Mr. Dawkins wrote, "Living things are the main examples we know of things that participate in cumulative selection. They may in practice be the only things that do." I contend that if Mr. Dawkins applies his actual distinguishing criteria to the systems and entities we find in real life, it will be extremely difficult--perhaps impossible--to find something which is _really_ "single-step selection." Electron positions might qualify, maybe; or maybe not. (There appears to be a good deal of debate about that, and it really _does_ have some interesting philosophical implications.)

The point here is that at the very least, Mr. Dawkins needs to go back and seriously work on his examples and probably on the foundational principles of his argument (I mean even more than I've indicated already!) Hey, who knows? Demonstrating that practically _everything_ in existence goes through cumulative selection (with a few very rare exceptions which tend to cause problems _because_ of the real implications of single-step selection) might actually help him! I don't know; I can only analyze what he has, not what he doesn't. But if he goes to the trouble to provide clear rebuttals to his own contentions, what can I say? (Except maybe to poke fun again at the RSL... man, they must have been on allergy medicines that week...)

p 49, "It is amazing that you can still read calculations like my haemoglobin calculation, used as though they constituted arguments _against_ Darwin's theory."

True enough; and I don't want to leave the impression that
my criticism above is directed along that line. I think Mr.
Dawkins' computer example illustrates fairly well the fact
that arguments against evolution based on the premise of
single-step selectivity are making a huge category error,
and are therefore fallacious. In fact, his example has even
helped me out, because it's provided me a clearer means of
illustrating this point myself in the future. I think Mr.
Dawkins either sloppily applies, or selectively ignores,
the implications of his programming example; but that
hardly means I think the example a bad one.

p 49, "Clouds are not capable of entering into cumulative
selection."

Now we're going to see whether Mr. Dawkins applies his own
criteria and definitions. Why doesn't he think they are
capable of entering into cumulative selection? Because:

p 49, "There is no mechanism whereby clouds of particular
shapes can spawn daughter clouds resembling themselves."

And the rest of his attempted refutal of the recognition
that clouds are affected by cumulative selection follows
this line, through the middle of page 50. Let the reader
note: this is _not_ Mr. Dawkins' own criteria by which he
differentiated single-step and cumulative-step selection
back in the monkey program. What made the single-step
version of the program so awfully inefficient in terms of
the probability it would ever reproduce METHINKS IT IS LIKE
A WEASEL? Answer: there were absolutely no causal links
between one iteration and the next. The math itself made
this very clear. But there _are_ causal links between what
a cloud looks like one moment and what it looks like the
next. Mr. Dawkins is treating the cloud the way he warned
us _not_ to treat the live bird back in Chapter 1, p 11:
"simply as a structureless lump of matter with a certain
mass and wind resistance. It is only when we remember that
it has many internal parts, all obeying laws of physics at
their own level, that we understand the behavior of the
whole body." Clouds are not static balls of cotton that
just wink into existence and then disappear. They have many
internal parts, all obeying the laws of physics at their
own level. I will grant that a biological entity has many
more kinds of internal parts than a cloud does, and so more
types of counterbalancing restrictions. But the fundamental

principle of cumulative selection is operating in both cases; and Mr. Dawkins does not recognize this fact. It is apparently very important for his argument that he divide living and non-living entities into sets dependent on two fundamentally different types of selection process; the problem is that this division is an illusion. If his argument _really_ requires this division, he's in deep trouble. I do not myself claim that it requires this division; if I were a philosophical naturalist, I think I'd have to find a way to put forth the argument without claiming a fundamental distinction which doesn't exist, but I'm not sure how I'd go about it in this case. I suppose that's a job for the philosophical naturalist!

p 50, Mr. Dawkins fairly notes that though the computer/monkey/Shakespeare model is useful for illustrating the distinction between single-step and cumulative-step selection, it is misleading because it was working on a goal which he had given it himself, and "Life isn't like that. Evolution has no long-term goal." He then intends to change the rules such that pictures instead of words are generated, with no preset target. This will be better (though as we shall see he can't quite keep from fiddling with the parameters to get what he wants.) But he does recognize the misleading philosophical implications of the earlier example, and to be fair (having gone back and checked a few times), he doesn't at that point make this sort of claim for what the programs are illustrating. He does make others, that I think either don't wash or are at least highly biased in favor of the cumulative monkey, but he doesn't make _that_ claim.

p 50, "There is no long-distance target, no final perfection to serve as a criterion for selection, although human vanity cherishes the absurd notion that our species is the final product of evolution."

I'm sure there are plenty of people who cherish this "absurd notion" (that we are the final product of 'whatever'); but whoever else they are, they aren't Christians (at least, not Christians who've been paying attention in church.) Even the most hard-nosed "backwoods" fundamentalist Christian would not claim that we are the final product of God's design, for the very simple reason that according to Christian beliefs God isn't through with us yet and a radical change in our status as a species is coming. A Christian even more familiar with Scripture would

note that the Bible is mainly concerned with God's
relationship with man, and not about what God intends to do
with the rest of nature (meaning we should be very careful
what sort of guesses we make about His intentions on that
subject.) There are hints in the New Testament that the
eventually sanctified mankind will have very much more to
do with Nature than we currently can accomplish, or are
expected to accomplish, but this will be for Nature's
benefit, not for our vanity or glory. It is of course
possible to concentrate utterly on the first chapters of
Genesis (which relate to a state that, according to the
same story, we're no longer in anyway) and take that out of
context with the whole, but Christians aren't supposed to
be doing that. By and large, Christianity tends to
seriously _deflate_ our human vanity, not give it grounds
for growing. If you, the reader, would like to examine
ostensibly 'Christian' movements in the past that have
taken the stance of inherent final human superiority, I
think you will discover they invariably concentrate on a
few selected passages to the exclusion of others, which
gives a false impression of the belief system.

There are, of course, atheists and agnostics and perhaps
other sorts of theists who may believe that our species, as
is, is the final product of 'whatever'. I tend to think
most pantheists would assert we're still 'in process', so
to speak. And Christian theists do, too. As far as the
question of whether our species is the final product of
'whatever' is concerned, the Christian and Mr. Dawkins are
similarly agreed. To be fair to him, he doesn't
specifically mention 'Christians' or even 'Creationistic
theists' in general as the target holders of this "absurd
belief"; but considering that "naive" "backwoods"
fundamentalists are his chief target of opportunity, I
thought I'd better nip any implications to that effect in
the bud.

The bottom of p 50 and the top of p 51 give a good
description of the physical processes of cumulative-step
selection as they operate in biological entities. Here, we
readers can see how biological cumulative-step selection
differs from that of the cloud; the processes (though _not_
the underlying principle) are different because the
biological entity (say, a frog) has a different means by
which it replicates itself. This part also helps the reader
to understand the fundamental difference between the
single-step and cumulative-step selection of the computer

monkey example: cumulative selection really is a process.
In the single-step example, we get 1x10E40 different
potential states, all with an equal chance of being
'chosen', so to speak. There is no process involved. The
cumulative-step selection examples all show a process of
some sort. This goes for the cloud and Mont Blanc, too, as
they also are the results of partially random and partially
static determinants. The means by which a cloud changes its
shape, and the means by which a frog species changes its
shape, are different; but the principle is the same.

It is more accurate to consider the frog as a species for
this sort of thing, because an individual frog is but one
instance of an ongoing process. At any given moment on
earth, there is a 'cloud' of Species X frog, very slowly
changing from Species W and into Species Y (actually into
Species Y, Z, AA, etc., but we'll just consider Y). The
difference is that each composite unit of 'Frog X' stands
as a miniature representative of the characteristics of the
species 'in toto', while a water-droplet or cubic inch of
cloud does not. This is not because a fundamentally
different process is going on; it is what one may expect
from the same process taking place through different
physical venues. Cars on an interstate have different
'behaviors', both at the composite and individual levels,
than a phalanx of tanks; and this is due to the particular
setup of physical circumstances. But the fundamental
principles of fuel-driven locomotion haven't changed. (Of
course, the cloud and Frog Species X are physically much
more different from one another than the
interstate/blitzkrieg set; I'm trying to give the reader an
example of a situation where the relationship between
similarity-of-principle and difference-of-physical can be
seen more clearly.)

p 51, "[The tree-growing procedure] is 'recursive' because
the same rule (in this case a branching rule) is applied
locally all over the growing tree. No matter how big the
tree may grow, the same branching rule goes on being
applied at the tips of all its twigs."

Mr. Dawkins is discussing an example of recursive
programming, not biological trees; but I think he'd agree
that the same principle will be illustrated. (Actually, he
says as much near the bottom of 51 and throughout the top
of 53.) The real question is how long Mr. Dawkins intends

to keep this rule in mind. I'll be referring back to this concept later. Until then, remember that:

p 53, "[T]his large-scale form [of the adult] _emerges_ because of lots of little local cellular effects all over the developing body... It is by influencing these local events that genes ultimately exert influences on the adult body." [italics his]

I have no problem with this whatsoever. But I expect the acceptance of this sort of principle will end up colliding with some of Mr. Dawkins' own positions later on.

pp 53-55 are, as far as I can tell, useful descriptions of how genes work and their function in the body. It's simplified, but Mr. Dawkins and I will both agree that the principles here carry over to hypercomplicated situations. Mr. Dawkins will have to explain how non-sentient nature introduces the sorts of constraints he is arbitrarily working with here, but that shouldn't be a problem. If he somehow misses it, I'll introduce it; but I expect him to include it because it's extremely important to his theory.

p 56, "DEVELOPMENT most emphatically does not pass gene value back to REPRODUCTION--that would be tantamount to 'Lamarckism' (see Chapter 11)."

I think he means that, for instance, an okapi who streches his neck really far to get leaves, doesn't pass on genes to his offspring that provide a longer neck thereby turning him into a giraffe. Neither DEVELOPMENT nor REPRODUCTION at this point has a provision for mutating a gene. Mr. Dawkins is going to assign that possibility/probability constraint to REPRODUCTION, which seems the proper place.

p 56, "The progeny in any one generation are different from their parent in random directions. But which of those progeny is selected to go forward into the next generation is not random."

True; because the probability of a mutated progeny spreading its DNA is directly related to how efficient he/she is at suriving long enough to replicate (as Mr. Dawkins notes on p 57.) Obviously, mutations which make the survivability and/or replication process more efficient are going to be, in the long run, the mutations which are passed on. Note that Mr. Dawkins has yet to functionally

exclude Someone sending the mutations; this particular
subtheory works just as well for Christian theism (for
instance) as for atheistic naturalism, so far.

pp 56-57, "This very high mutation rate is a distinctively
unbiological feature of the computer model. In real life,
the probability that a gene will mutate is often less than
one in a million. The reason for building a high mutation
rate into the model is that the whole performance on the
computer screen is for the benefit of human eyes, and
humans haven't the patience to wait a million generations
for a mutation!"

Maybe; but this might also be unfairly representing the
probability factor, even as Mr. Dawkins presents it. Mr.
Dawkins went to the effort earlier in this chapter to
illustrate how much more 'quickly' his cumulative-step
monkey got to the Shakespeare verse before the single-step
monkey was likely to. But, notice that he rather shifted
the speed in the cumulative monkey's favor. There were
several parts of that process that he didn't quantify out
for us; and as long as he's illustrating a principle, this
might not be a problem. But he should be fair and not
trumpet how much 'faster' the cumulative monkey program is,
if he's set up unrealistic groundrules for it. (Either that
or he should spell out the groundrules and demonstrate that
it's still faster, mathematically. There are several things
about that experiment that deserve a closer look for
fairness' sake, so I have dedicated an appendix to an in-
depth discussion of it. See: "Monkeying with Probability".)

On the other hand, he is being fair here and noting that
he's using the human eye to make the choices, rather than
'survival'. As long as he takes this restriction into
account and doesn't make categorically erroneous assertions
from it, everything will be fine. That is, it can stand for
'survival' in certain limited respects; but he won't be
able to fiddle with the program until it grows the word
"Macintosh" out of biomorphic shapes and then sensibly
claim this illustrates how blind survival of the fittest
works! And every time he does this, remember he's tacitly
acknowledging that, in principle, _God could be doing this,
too._ It's not an exclusion of God yet. In fact, he himself
has to point out occasionally that there's no God doing
this, even though he himself has to do it for sake of
illustration. But he's bringing that denial of God's

existence _to_ his study; he obviously is _not_ deriving it
from the experiment.

p 59, "When I wrote the program, I never thought that it
would evolve anything more than a variety of tree-like
shapes... Nothing in my biologist's intuition, nothing in
my 20 years' experience of programming computers, and
nothing in my wildest dreams, prepared me for what actually
emerged on the screen."

Well, that seems rather unlikely, to say the least! For one
thing, any evolutionist of any philosophical stripe
whatsoever ought not to be surprised if 'plant-like'
biomorphs eventually become 'animal-like' biomorphs. More
importantly, though, he's guiding the selection of which
shapes pass on the mutant genes and which don't. Even _he_
notes that he did _not_ look down on the very last drawing
and exclaim, 'Gosh! All of a sudden it looks like a bug!'
On the contrary, he writes, "I can't remember exactly when
in the sequence it first began to dawn on me that an
evolved resemblance to something like an insect was
possible." From the drawings he included, I expect this
happened back along generation 10 or 12, certainly no later
than 16 where it gets 'wings'. At whatever point it
happened, his own description of his procedure after that
event makes it clear that the continuing progress along
that line was a self-fulfilling prophecy; and if it
happened earlier back around 10 or 12, then it would be
hard to say it 'looked' like a 'plant' before that. But
really, when he writes:

p 59, "**With a wild surmise**, **I began to breed**,
generation after generation, **from whichever child looked
more like an insect.** My incredulity grew in parallel with
the evolving resemblance." [italics mine]

I just get a tad suspicious about this. Is he really
saying, 'The more and more I chose increasingly bug-like
shapes the more surprised I was when it turned out looking
more and more like a bug'?? Quick, pick my jaw up off the
floor! As Gilbert Gottfried says in Disney's _Aladdin_,
"I'm having a heart-attack from not-surprise." Read the
bottom of p 59 and the top of p 60 and you get a picture of
a man responding positively to having a God complex, not to
perceiving the wonders of blind nature.

Don't get me wrong; I'm not disparaging him for this.
Frankly, I myself would say this is God shouting "PICK UP
THE CLUE PHONE!!", but I'm not using his response as
evidence for this proposition. Let that be as it may. But
when he turns from this experience to describe this little
monster (and its many sequels) as explicitly "undesigned
and unpredictable" (middle of p 60), then I have to cry,
"Halt!"

Whatever else these things are, they are _NOT_ "undesigned
and unpredictable". Mr. Dawkins himself notes this near the
bottom of p 60 when he writes that they resulted from
"artificial selection, not natural selection." Fine. But
then stop telling us that the shapes are "undesigned" and
"unpredictable". By choosing which shapes continue, based
on 'phenotypic effects' (e.g., Hey, that's starting to look
like an airplane!), he _is_ "designing" them. And once he
gets an impression in his mind to work toward, I think one
can predict with a reasonably high degree of accuracy that
it will eventually end up looking more and more like a
fighter plane. He can't have it both ways. To his credit,
he mostly doesn't _try_ to have it both ways (here at
least); he admits that his program gets the results it does
because he chooses the shapes, and even (this is an unusual
admission for a philosophical naturalist and much to his
credit) that if we used a pattern recognition computer
program instead of a 'by-eye' method, it would still be us
setting the parameters, and so in principle would not be
bringing us close to natural selection. But then he has to
stick to it; and he's rather spotty about that.

This brings up another interesting little point on the
side. Mr. Dawkins calls the method by which those shapes
evolved "artificial selection" (e.g., bottom of p 60)--when
he's not trying to impress us with their non-design and
unpredictability, of course! And he contrasts this with
natural selection, especially at the top of p 62 where he
notes that by and large the selection criterion is
nonrandom death. (Actually, random death plays a part, too;
for example, a mutation which makes a child potentially
more attractive to a mate than its parents were, will be
lost if the mutant meanwhile dies in a fire before it has a
chance to find a mate.) And of course, this is a blind,
non-sentient process. So what exactly is Mr. Dawkins
distinguishing between when he declares one set of
selection 'artificial' and the other 'natural'? He himself
is supposed to be totally a part of the blind interlockings

of nature! But he makes the distinction anyway, as if he were not. How did he come to be separate, or partly separate, from nature? And if he isn't, why the distinction at all? When an author says there is nothing but the blind interworkings of nature, and then goes on to describe his own behavior as artificial as opposed to natural, then I think it's fair to suspect him of applying a double-standard somewhere. But we'll have to get back to this later.

Insofar as the proposed computer experiment on p 62 is concerned, I think this is on the right track. The main problem is still a categorical one, though; any behaviors which evolve from this will be what we call 'instincts' as opposed to 'reason'. They will be pure reactions, not action initiators. This may be a very good tool for tracing the evolution of nonrational behavior; it may even demonstrate (as I expect it will one day) that instinct can be developed until it serves as well as reason or even better. We see this already in the navigational and architectural abilities of some animals. (I am assuming no supernatural influence here, though of course given my beliefs I'm certainly not required to exclude it.) But instinct and reason have some rather fundamental differences from each other. They can function together, or apart from one another. (I don't suppose any human currently has the capability of ever working completely without instinct, but quite a lot in our bodies goes on without our having to reason it out or otherwise actively initiate it.) This distinction is, I think, between action and reaction. It's also one I think Mr. Dawkins makes himself back on page 60 when he describes his active influence in the pictures as producing an 'artificial' _instead of_ 'natural' selection. It's a highly important distinction to any philosophy (even a philosophy which denies reason has to have _some_ idea of what it's denying), and we're about to touch on it again in the following remark.

p 63, "Other versions [of a popular cliché] are that computers only do exactly what you tell them to, and that therefore computers are never creative. The cliché is true only in a crashingly trivial sense, the same sense in which Shakespeare never wrote anything except what his first schoolteacher taught him to write--words."

This is another category error. Presumably, Shakespeare did
not purely react to his training (via the schoolteacher)
and his environment to produce his works. That's why he was
"creative". If the computer can actually initiate
independent action--something which is by definition above
and beyond pure reaction to its instructions and
environment--then I suppose it is creative. As it happens,
every attempt I've seen so far to assert that computers are
capable of this breaks down under scrutiny; but that's not
the point (otherwise I'd be merely applying to the Argument
from Personal Incredulity!) Mr. Dawkins here touches on
what I think may be the very root or key of the debate
between advocates of a non-Sentient Independent Fact (e.g.,
atheistic naturalists) and advocates of a Sentient
Independent Fact (e.g., pantheists or supernaturalistic
theists such as Christians.)

To be "creative" means that the entity in question can
"create", which is practically by definition an action, not
a reaction. To really "create", the entity must be able to
initiate results; if the entity cannot initiate results,
which requires that the results be _more_ than can be
accounted for by the sum total of whatever _reactions_ went
'into' or 'through' the entity, then the entity cannot be
said to be truly creative. To put it more shortly and
colorfully, Shakespeare had to add his own two cents to the
total.

As long as 'action' is _only_ another name for 'reaction'--
i.e., any 'action' is only another reaction looked at from
a particular angle--then at bottom a n-SIF must be true.
But then, so much for any attempt to argue any contention.
One cannot act to demonstrate that actions are in fact
impossible; and we commonly discredit the validity of an
purported argument by demonstrating that it results purely
from reaction. If we believe that Mr. Dawkins was _not_
purely reacting to stimulus when he wrote TBW--if we
believe that he _is_ acting and choosing to make a point--
then we are (perhaps without realizing it) denying the
existence of a n-SIF. And since there must be in _any_
event a final Independent Fact upon which reality is
grounded, if it is not non-Sentient it must by default be
Sentient. On the other hand, if we believe that Mr.
Dawkins' book is purely a result of blind, non-sentient
forces then I'm not sure what value the book would have.
The laws of nature work inexorably; this book would have
appeared whether it represented reality or not. We know for

a fact in other situations that it is indeed possible for a human to represent something which is not in fact realistic, so we can have no built-in confidence that, if this book appears in our hands by what amounts in the end to the blind forces of nature, it will represent reality accurately. It may, or may not. To put it bluntly, we have to 'check it out for ourselves', or 'put it to the test'. We have to do the logical math. But if we are doing this, _we_ are acting not just reacting; and so we ourselves invalidate an attempt to demonstrate that everything is blind reaction. As Dr. Johnson replied to an argument for non-materiality, "I refute it _thus_!" (and stamped his foot.)

This is not exactly the same as proving that some sort of God (a Sentient Independent Fact or SIF) must exist; it only means that if we follow the implications of our thoughts and basic assumptions out to the end, we will find it formally impossible to even cogently argue from the _premise_ that a n-SIF exists (i.e., that there is no SIF, or that there is no God), much less argue _to_ that conclusion. If we start with God as a premise, we can without flat self-contradiction account for our rationality, though we cannot argue to God as a conclusion. If we start with our rationality as the basic premise, we either discover that God is a necessary component of reality (the reader may consider that a 'proof' of God's existence if you like); or, as some naturalists attempt, we can try to show that the ability to initiate actions can be developed out of pure reaction. I think when the naturalist's attempt is put this cleanly, it becomes obvious it is self-contradictory (though not necessarily self-refuting: it doesn't undercut itself, it is just a nonsense statement--like trying to claim a rock can change speed and direction without the addition of a force vector.) Naturalists are therefore rather shy about putting their task this plainly. Nevertheless, if a man says, 'I can reason' and also 'Everything about me is totally derived from ultimately non-rational causes', this is the problem he sets himself.

I invite the reader, meanwhile, to compare the following phrases of Mr. Dawkins: "I programmed EVOLUTION into my computer, but I did not plan 'my' insects..." [p 64], and "I began to breed, generation after generation, from whichever child looked most like an insect." [p 59]

Mr. Dawkins might reply that the phrase from p 59 does not
mean he was planning his insects: he wasn't aiming for a
distant target. But when he writes on p 64, "my selection
'strategy', such as it was, was opportunistic, capricious
and short-term," this does not match with the action of
choosing whichever child looked most like an insect,
generation after generation. This is not capricious, but
quite dedicated--i.e., he didn't decide three generations
later to try making it look like an airplane. It is only
opportunistic insofar as the point at which he said 'Hey, I
wonder if I can make this an insect?' was not at the very
beginning. And a short-term plan is still a plan (besides
which I'm not sure how accurate 'short-term' could be if he
did this "generation after generation").

Mr. Dawkins attempts to illustrate that his insects _were_
unplanned, by telling us the story of what he had to go
through to reproduce the results (since he hadn't had the
foresight to include a save-tracking feature for the
genetic code.) He had to try to reconstruct their method of
growth by testing different genetic codes until he got
something that looked close enough to count. This took a
while, and there were many failures. Apparently Mr. Dawkins
thinks that because there were many failures, it shows the
original insects were unplanned. Perhaps my opinion about
this conclusion will be clearer if I illustrate a similar
procedure.

I'm playing a computerized strategy war game (I'll use
SSI's old _War of the Lance_ as the example). The actual
goal of the game is ultimately to capture two strategic
points deep in enemy territory within a certain time limit,
but usually this is not an 'in-sight' goal. I have to build
up my armies, forge alliances, defend against incursions,
and essentially treat the final goal as nonexistent for a
long period of time. It is, in fact, technically possible
to begin the game without knowing the 'win conditions'
(there are indeed several types of win conditions in WotL)
and then just play along according to the groundrules and
see what happens. Let us imagine that this is what I'm
doing. I defend, build up my armies, maneuver my troops out
of harm's way and pick off overextended enemy positions.
I'm not trying to accomplish anything long-term at this
point, I'm just diddling around and learning the game
interface.

It suddenly occurs to me that the computer's pieces are misaligned; I have some troops in a naval convoy which it doesn't apparently see. There's a chance I can take that tower and that city. Being a prudent sort, I save the game. I then--playing mostly by eye--disembark the troops and move them into battle. At each turn I take whatever actions seem, at the moment, most likely to eventually end with me in those two spots; I throw a flanking charge here and move some flying troops there. Battles are fought. Random events occur, but I persevere. Less than 20 turns later, I take the last of the two locations and (lo and behold) I am awarded with an announcement (unexpected, to me) that I've won the game! COOL! (Insert _Also Sprach Zarathustra_ music as necessary.) In this example, I wasn't expecting to 'win', per se; but I recognized a goal and made efforts to reach it. Now, is it sensible for me to claim that my win "emerged", "unplanned"?

Let's continue the example. My brother, Spencer, (who happens to be far more familiar with the game than I am, and incidentally a much better strategist) wanders by and sees me abandoning my dignity with a victory dance of some sort. "Hm!" he notes, looking at the final results on the map. "It's a good thing you managed to get to those two spots in time: you only had one turn left before you would have lost."

"It vass, uf kerse, no problemo for a master strategist such as I!" I gloat.

"Okay," says my brother. "Do it again. Where did you last save? Twenty turns back? Restore that save and see if you can do it again. But you can't save every time you make a small advance; if you reload, you have to reload from that point only."

"Muahahahahaa!!" pretty much sums up my confident reply. So I reload from my save point, about twenty moves back, and try again.

And again.

And again.

Three days later my ego is more or less neutralized, because after more than 30 replays I haven't managed to repeat my feat. There are just too many variables;

apparently, though I hadn't recognized it at the time, I really had had a longshot chance of winning the game at that point and got amazingly lucky. But does this illustrate that the original win was just something that "emerged", "unplanned"? No; I had still planned it. What becomes obvious is that planning (at least the planning of a non-omniscient, non-omnipotent entity like myself) is _by itself_ not enough. But just because it isn't enough, that doesn't mean that we can claim it never existed.

Mr. Dawkins' insect might have shown up purely from his randomly picking shapes; but he didn't do that. He developed a plan, not terribly far from the beginning of the test: 'make the best insect-shape possible'. It happened to work, that first time. It didn't work the other times. Trying to convince us that it was unplanned the first time sounds a bit like sour grapes, to me: 'Hey, my plans aren't working out now, so I guess it was unplanned to begin with' is a logical fallacy. Note that he didn't just turn the computer loose and give the whole thing up as an accident. He kept running _as much of the plan as he could remember_, making alterations here and there and drawing inferences from the results, so that he could eventually learn enough to _reconstruct the original plan_ (or close enough.) This is not supposition on my part: he says as much in the middle of p 65.

Mr. Dawkins apparently would like to functionally equate 'almost powerless' with 'powerless'. But in principle (though not always in result) these are two different conditions. And Mr. Dawkins didn't exactly remain (almost) powerless, did he? He kept at it, and learned a lot more about what was really going on in his program, and eventually got to the point where he could do what he wanted.

A novice swordfighter, who has some basic idea what's going on, squares off against me for the first time and, after making a plan and implementing it, manages to score a hit. The fact that his plan wasn't really a very deep one doesn't mean his hit just emerged unplanned. He tries again and fails. And fails again. And again. This happens because I'm a more skilled fighter than he, and his first success was a lucky fluke. If he keeps it up, though, he'll learn more about the fundamental properties upon which (though at the time he didn't know it) his original plan depended; and if he sticks with it (bad pun!) long enough, he'll probably

be able to implement the plan successfully. The difference
is not between 'no plan' and 'a plan'; it's between a
lesser and greater understanding of the implications of a
plan.

In the second full paragraph of p 65, Mr. Dawkins
essentially equates 'creativity' with 'efficiency'.
Philosophically, this is a false equation. Not that
creativity isn't, in fact, often efficient. But that
cannot, by itself, be the true grounds for determining the
existence of creativity; for the very simple reason that
Mr. Dawkins himself does _not_ think that (for instance)
the extremely efficient echolocastic bat was itself
'created' or is, itself, really 'creative'!

'Gosh!' I exclaim, after reading how effective that bat is
at echolocation. 'It certainly is creative!' What is Mr.
Dawkins' reply? "There is no suggestion the bats know or
understand the theory [of echolocation]... The bat should
be thought of as analogous to... [an] _instrument_... [his
italics] A bat is a machine, whose internal electronics are
so wired up that they [function automatically]." (Ref to p
36 for his description of the police radar unit, which is
what he wants us to compare the bat to: these quotes come
from pp 36-37.)

'Well,' I mumble, properly chastened. 'At least something
or someone was pretty creative to come up with something
that efficient.' Does any reader at this point doubt what
Mr. Dawkins' reply to this would be? If you _are_ in doubt,
check back through the quotes I've been pulling which give
Mr. Dawkins' opinion about the nature of the universe,
since chapter 1. Heck, check the book's cover! In
triumphant monotony, Mr. Dawkins will declare that there is
no God and that Nature is blind and unconscious and doesn't
really 'design' things.

If Mr. Dawkins actually _wants_ us to accept the assertions
he keeps throwing our way (we still have no actual
arguments in favor of his philosophical positions yet), why
in the name of Mont Blanc would he expect us to accept that
creativity and efficiency are in any shape, form or fashion
related!? Perhaps he only means that there is no such thing
as "creativity", that it is an illusion? No, according to
him:

p 65, "When you first evolve a new creature by **artificial** selection in the computer model, it feels like a creative process. **So it is, indeed**... **[I]t is a truly creative process**..." [italics mine]

Well, yippee. So apparently truly creative (not just apparently creative) processes _are_ possible; but not in the case of the bats. But apparently not in the case of the computer-grown biomorph, either, despite what he just wrote:

p 65, "[I]t feels like a creative process... But what you are **really** doing is _finding_ the creature, for it is, in a mathematical sense, already sitting in its own place in the genetic space of Biomorph Land." [asteriked italics mine, underlined ones his]

So, we're not really creating the creature, we're finding the creature. But he has told us that it is nevertheless a "truly creative process". His use of the word "artificial" above even carries that implication!

I could dance around on this all day; but the bottom line is that Mr. Dawkins himself either has no real clue what he means by "creative" (in which case, there certainly seems no reason to attend to this phase of the argument or anything which he may try to derive from it hereafter), or he's worked himself into a sticky wicket and is relying on fancy footwork to get past the reader. Personally, I think he knows pretty well what 'creative' implies, and that real creativity must exist somewhere (else his own book "emerged" "unplanned" which wouldn't exactly form a ringing endorsement for its potential validity); and yet he needs to find some way to make 'creative' mean something ultimately quantitative and physical. Linking it to 'efficiency' probably seemed to him like it did the trick; until someone asks why the bat's efficiency _is not_ therefore an indicator of some kind for a "truly creative process."

This doubletalk continues on p 66, wherein Mr. Dawkins appears to come down on the side of 'no real creativity, just better efficiency'. But this seems to me to beg the question; his 'evidence' depends on how creative we _feel_ when doing particular tasks. But what has this got to do with whether we really are creative or not? Given examples which _by default_ are presented as non-creative activities

(e.g., "Turning things over at random [in a small space]
and hoping to stumble on the sought object"), he observes
that these don't feel creative. Well, duh! I hardly "feel
creative" when turning my desk inside out looking for a
quote I know I worked-up yesterday. Are we then invited to
conclude from the fact that we feel 'creative' when we are
forced to search in a more "sophisticated" manner that this
is an illusion? This would only work if any and all more
"sophisticated" manners were proven to be non-creative; but
this is instead the position he _assumes_.

Another problem is that he's slurring over the
philosophical aspects of 'creativity'. There are (at least)
two philosophical distinctions to real creativity: they go
by different names, but in this book I'll call them the
absolute and the relative. By 'absolute' creativity, I mean
the ability to generate anything above and beyond 'the
mix', so to speak. Free will would, in that sense, be
creativity; and whether the entity in question holds that
sort of creativity independently or dependently (i.e.,
either God or man), it would still count. Relative
creativity has to do with an already given ability and what
can be done with it. I presume that the question is open
whether God could create a new primary color or whether
this is a contradiction in terms--the rules given for this
sort of Nature may be such that a new primary color is not
possible in our system (though God could create a 'new' one
by creating a new Nature.) One could even argue for a while
over whether our definition of 'primary color' is purely
subjective, or a subjective impression of a real
quality/limitation of natural law. But it is quite certain
that a human being cannot create a new primary color, as
such. Nor can we create new natural laws (or new
supernatural laws, if any exist.) We may transcend them,
perhaps, but that is not the same as making new ones (and
we would be able to do that to natural law only by being
linked dependently to already established supernatural
laws.) So, in the relative sense, humanity is not creative;
and to that extent, Mr. Dawkins is quite right about
'finding' potential biomorphic shapes as opposed to
'creating' them. The problem is that he wishes us to treat
our inability to be relatively creative so that it
necessarily equals our inability to be absolutely creative,
and also so that it necessarily equals _any_ potential
entity's inability to be absolutely creative. (i.e.,
because of this, we may conclude God doesn't exist.) But
the two applications of 'creativity' are distinct; and he

doesn't even bother to argue this to a conclusion--he
merely asserts it. Therefore, I think an error in logic and
an error in methodology go hand-in-hand here.

I called this sort of thing a "sticky wicket" a moment ago,
and even if I haven't been perfectly clear, the reader
should see what sort of mare's nest gets thrown up when
issues of 'creativity' are introduced. The problem is that,
for a naturalist, an assertion either way costs something.
Deny real creativity and the validity of one's own work
(which presumably has a real 'relevance' or 'meaning',
something recognizable above the mere physical facts of its
existence) becomes suspect. Even earlier terminology
becomes suspect: what does Mr. Dawkins mean by "artificial"
as an adjective in opposition to "natural" if there is
really no creativity (or for that matter if there is only
the natural?) But admit the concept of creativity, and one
admits that the blind, interlocked, non-sentient system of
Nature can be trumped. How is this possible from within the
system? Suddenly a "supersystem" or "supernature" becomes a
virtual necessity; and the question of how a non-sentient
system could by itself produce entities that can trump it,
raises its ugly head. I think Mr. Dawkins, at some level,
realizes all this; that's why he shifts ground throughout
this part of the discussion, at one moment claiming that
there really is creativity, and at the next claiming it is
merely a feeling arising from application of efficiency.

If I had to reduce my last few pages of argumentation and
observation of Mr. Dawkins' methodology, it would be this:
Mr. Dawkins essentially says 'If creativity is real, it
must really be something else.' This is basically the same
as saying, 'if x=16, then x must really =6.' It's a
nonsense statement. He hasn't succeeded in saying anything
useful or true about creativity. He wants it both ways.

Meanwhile, continuing from the middle of p 66 through p 67,
Mr. Dawkins does a good job illustrating the concept of
multiple dimensions and their application to biology and
genetics. This can be a tricky subject because we tend to
try mentally picturing, say, a 9-dimensional set as a sort
of 'space'. (And since space has only three visual
dimensions, the attempt to spatially picture a 9-D set can
make our brains itch, to put it mildly.) I myself have had
some success helping people get this idea by using the idea
of a swimsuit model. (That could be a male model, in case
anyone out there suspects me of chauvanism!) A swimsuit

model has a number of easily-considered 'categories': hair-length, hair-color, eye-color, skin-color, waist measurement, type of swimsuit, etc. You could increase this category list to be extremely comprehensive, or shorten it to include only things the reader cares about. Each category could be objectively measureable, or merely represent a subjective impression of the reader. It can be as complex or as simple as the reader likes. Now, here's the trick: anything you listed as a 'category' is exactly the same sort of thing a mathematician means by 'dimension'. Each category value is more-or-less distinct from the other category values, but of course that doesn't mean that they are necessarily independent of one another. Hair length has no bearing on swimsuit-type (or none that I can fathom!); but it does have a bearing on hair-color (zero hair length necessitates zero hair color, unless you want to get _really_ picky.) If the reader imagines a paper-doll swimsuit model, and considers what could change on that doll (and the effect it would have on the 'look'), you now have a working idea of a multi-dimensional object and its multi-dimensional potentiality.

The main difference between my illustration and Mr. Dawkins', is that I've presented a single-step selection process: you can change the hair from red to blonde, or to black, or vary the length, or whatever--there is practically no processional link between any of the options. What Mr. Dawkins describes in genetic space is a cumulative-step selection process, where the condition of all categories (or 'dimensions') at any moment has a direct bearing on the sort of potential possibilities for change. The original biomorph on page 59 isn't going to skip ahead to get its wings by one change.

Note that this is only true, though, if we follow biological evolutionary procedure. Something inherently capable of transcending the groundrules, so to speak, could produce different effects, or even set up a complicated effect which 'hits the ground running', so to speak.

'Ah, so we're back to Adam and Eve after all, eh?' snorts the sceptical reader. Maybe, though not necessarily. I only want to point out that an understanding of the normal rules doesn't, _by itself_, abolish exceptions to the rule. If the sceptical reader has a hard time with this concept, consider that Mr. Dawkins, as the creator of his program, is probably quite capable of setting up some groundrules

and then dropping a fairly well-developed biomorph into the system, which he can then allow to proceed by the groundrules he has chosen--or not, as it suits him. His system, rather than being thrown out of whack or disintegrating or crashing, is probably quite capable of accepting this new input and running with it. It might of course crash if he didn't design it very well; but most theists assume that an omnipotent, omniscient God is by definition a pretty good Designer! This is not an argument that Adam and Eve 'really existed'. I'm only attempting to illustrate that the introduction of material into a system doesn't necessarily "violate" anything, to use Mr. Dawkins' terminology. Computer programs and math problems actually make for an excellent illustration of this.

But I have to bring it up because some naturalists tend to advance, as an 'argument' against the supernatural, what is really an assertion of personal feelings about a situation which doesn't, in fact, match what we discover in real life. The reader doesn't "violate" the underlying integrity of his fishbowl (considered as a system) by adding food, though the addition of the food is not itself explicable in terms of the fishbowl 'system'. Mr. Dawkins has already relied once on the emotional overtones of the term "violate" to distract the reader from considering the actual plausibility of the contention. This would be similar to an attempt by a theist to 'argue' (and I use that term loosely) 'It's completely AWESOME that Nature is so well-designed that God can work miracles in it!' This is not only _not_ an argument in favor of the proposition "God exists and created Nature", it's not even a useful supporting observation! The observation that the more complicated and interlocked a subsystem is, the _better_ it actually tends to handle new input, might be a useful supporting observation.

Of course, Mr. Dawkins has not tried to illustrate (yet) that the more complicated and interlocked a subsytem is, the more likely it is to 'crash' when tampered with (and thus, since our system hasn't crashed, it hasn't been tampered with.) I think this attempt would be impossible anyway, because for any given system of complexity X that crashes when tampered with, one can always theoretically suppose a complexity of X+Y that fixes the problem (meaning the original proposed system is always going to be less complex.) But despite this, the general contention 'super complexity=super fragility' is at the bottom of his attempt

to claim that supernatural action would "violate" natural law.

Now, an absolutely paradoxical proposition _might_ 'crash the system' if it could be introduced; but that's not a problem either, as such propositions are non-entities that borrow their seeming 'structure' from the rules of grammar rather than any inherent sensibility (that's why they're "paradoxes". I'm using the modern definition of paradox which means self-contradiction, not the classical term which only means _apparent_ self-contradiction.) "God creates a boulder" is not a problem, because no paradox is involved--and the system of Nature is perfectly capable of dealing with the boulder once it gets here. "God creates a boulder too heavy for Him to lift" is _also_ not a problem for Nature, because it's an intrinsic impossibility which 'looks' logical to the human eye thanks to English grammar; so the system of Nature would never have to deal with such an event anyway.

On a personal note, recognizing the actual relationship between systems and elements introduced into systems, helped me get past some problems I myself had with the idea of the "supernatural". I hope that this will also help my reader, if you've been having the same problem. It's not a proof God exists; it only clears away what amounts to a mostly emotional objection which I once shared with many other people. But I think it's one less objection to be worried about; and I think the reader should be careful when you see such a topic raised by Mr. Dawkins or other philosophical naturalists.

Meanwhile, getting back to the Mr. Dawkins' 9-D illustration, which continues through p 71: this is a tougher illustration to 'digest' than my swimsuit model earlier, but Mr. Dawkins' illustration is better because his method allows the reader to link the dimensions (call them 'categories' if it helps), with the underlying property of cumulative-step selection: the fact that the shapes depend on a process. I wondered a bit whether Mr. Dawkins wasn't ignoring the implications of the fact that his illustration shows the _minimum_ amount of change possible, but he (partially) deals with this at the top of p 71:

p 71, "Since the insect and the scorpion [from Figure 8, p 70] are 30 genetic units distant from one another, it takes

only 30 generations to evolve from one to the other _if you never take a wrong turning_; if, that is, you know exactly what genetic formula you are heading towards, and how to steer towards it." [italics his]

That balances the problem a bit; though he is still ignoring (at this point) another factor: in real life a million generations could pass before any 'movement' through genetic space at all occurs, whether it's in what we might arbitrarily call the 'right' direction or not. And the entity in which this movement occurs might not survive to pass on its progeny. (This is offset somewhat by the probability that its littermates share the same mutation, though that would only occur--I guess--if it and the littermates all come from the same divided egg. I'm not entirely sure about this, which is why I look to Mr. Dawkins for the biological data; this is something he could help me with, if he'll just get around to it.)

Of course, having written pretty much sensible material for the last few pages, and building the argument for the biology, he tags the end of that paragraph with: "In real-life evolution there is nothing that corresponds to steering towards some distant genetic target." Again, this is an assertion not a conclusion, and philosophical not biological. Actually, his philosophical methodology up to this point has been similar to a theist attempting to argue in favor of Christianity's truth and taking as his starting point the assumption that the Bible is wholly reliable, both historically and metaphysically. In short, he argues like a fundamentalistic atheist. It is "argument" like this which has convinced many people that discussions about religion or antireligion are pointless. They see well enough that the most vocal (and attention-getting) advocates of any side tend to argue in circles--and then conclude, erroneously, that it is _only_ possible to argue in circles.

Also, on a somewhat more minor point, the reader should note that Mr. Dawkins is functionally restricted to meaning _only_ that there is no "steering" in terms of conscious intent (which he himself can't quite jump off of in his computer examples), as opposed to "steering" in terms of a set final result. If the law of entropy hasn't been utterly misunderstood, all energy states will eventually be reduced to absolute zero at maximum distance from one another. In that sense, there _is_ a "distant target" towards which

Nature as a whole (and not just the selection of natural
laws which fall under biological evolutionary theory) is
"steering" all bodies, whether they are biological or not:
functional (though perhaps not technical) annihilation.

Meanwhile, at the bottom of p 71, Mr. Dawkins illustrates
again the difference between single-step and cumulative-
step selection processes, and their relative probable
efficiency. He does this by relaxing his restrictions
regarding how many genes may mutate at once, and the degree
to which they can mutate. Now it's possible, quite
literally, for any biomorph to 'hop' to any other biomorph
in a single step; but unfortunately it also means that all
given hops are equally improbable. This means that if
evolution worked according to single-step probability, we'd
see cats turning into ostriches (or at least the chances of
this would be as great as the cat turning into an ocelot.)
But it's a clever mathematical way of demonstrating what,
frankly, the fossil record already tells us; animals, under
the natural order, usually turn gradually from one animal
to the next. This also, by the way, increases my belief
that I've nailed the fundamental distinction between
single-step and cumulative-step selection: the connection,
or lack of connection, between one state and another. After
all, Mr. Dawkins presents this example as illustrating in
favor of an either-or proposition; and the basic either-or
involved in his computer example was whether or not any
given generation provided a base or stepping-stone for the
next generation. I'll have to ask the reader to refer back
to my remarks on that, for I think the recognition of this
distinction causes some serious problems for Mr. Dawkins'
arguments (though in this particular case, admittedly, not
intrinsically insurmountable ones.)

The reader may also check back to the beginning of this
chapter, for my remarks on Mr. Dawkins' misuse of
probability. You may remember that I noted that the sort of
probability Mr. Dawkins attempted to use at that point only
works when we have a frame of reference, multiple examples,
and a prior thorough knowledge of the principles of the
system. We actually have none of this information about the
total interlocking system of Nature, as I tried to
illustrate; but Mr. Dawkins' use of probability to make his
genetic hyperspace example a confirmation of the principle
of cumulative-step selection in evolution, _does_ fit that
sort of condition. If the reader didn't understand what I
was trying to say with my coin example, apply it to his

computerized genetic hyperspace example. We _do_ have clear
frames of reference, multiple examples, and a prior
thorough knowledge of the principles of that computer
system, and so judgments of probability and improbability
would apply to it. Essentially, it works because Mr.
Dawkins himself wrote his program and so understands its
ins and outs far more completely than he could possibly
understand Nature. (That doesn't mean he doesn't know a lot
about Nature; I only mean that unless _he's_ God he can't
understand Nature to the degree he understands the computer
program.) This means he's justified, in _that_ case, in
drawing conclusions about probability with respect to that
system. He's even justified in applying those conclusions
to the larger system of Nature, as long as he stays in the
bounds set by the conditions of his analysis of the smaller
system. Species either change with or without their current
state 'constraining' the amount of change in some way. His
system illustrates what we could expect, probabilistically,
if option b (without connection) were true. This is not
something we find in nature; therefore we may conclude that
species in real nature usually go through changes where
their current state sets limits on what their next state
could be like.

But please note that this conclusion has no bearing
whatsoever on the following questions: 1.) Does something
exist that _could_ choose to make such a change? (Itself a
combination of a rather large number of questions.) 2.) Has
it in fact done so in the past, and/or will it do so in the
future? 3.) Did it set up this system? About all that this
conclusion reached by Mr. Dawkins can say is: _if_ such an
entity exists (and the conclusion by no means excludes it),
then we can be reasonably sure that its normal mode of
operation on this planet, at least through the time-span we
can scientifically detect, follows cumulative-step
selection. Frankly, at this point, this is not a conclusion
that threatens Christianity or any other creationistic
theism (or even pantheism) that I know of.

And with this, my sketch of the chapter ends. Mr. Dawkins'
concluding "morals", as he calls them, drawn from the
illustration of genetic hyperspace, are well-developed as
far as I can tell, and I can't think of a better way to
illustrate them than he has himself. There are a couple of
philosophical assertions, too, but hopefully by now the
reader is learning to distinguish the difference--in fact,
that's one of the points to my brute-force analysis.

Sifting the wheat from the chaff is not an easy job; it's a tiresome one (mentally tiresome in this case, physically and mentally for real sifters). The real sifter has the advantage of gravity, by which chaff and wheat tend to sort themselves out. A person reading a book like Mr. Dawkins' must pick through it by hand, so to speak, though it's even more complicated than that: it's more like picking through the wheat and hoping that some of those other flakes are gold. One has to: a.) make sure the wheat itself is healthy and not rotten; b.) make sure the other flakes are gold instead of chaff. Of course, one might just hope for the best and blindly trust Mr. Dawkins that all those golden flakes of philosophy are not chaff (and that the wheat isn't rotten); but I think Mr. Dawkins himself would not put much value on blind faith in him--that would be a little too fundamentalistic, eh? But then, if we're going to pay attention to what he says, we'd better do it thoroughly.

Mud on the Carpet;
aka, Chapter 4: Making Tracks through Animal Space

Remember that huge discussion with which I began Chapter 3,
concerning probability, possibility, and certainty; and the
relationships between them? Here's where they get put into
action. But first a sidenote:

p 77, "As we saw in Chapter 2, many people find it hard to
believe that something like the eye, Paley's favourite
example, so complex and **well designed**, with so many
interlocking working parts, could have arisen from small
beginnings by a gradual series of step-by-step changes."
[italics mine]

Mr. Dawkins, as he himself admits, does not believe these
things were "designed". Thus, I wish he would find some
other word to use for "well designed"--'efficient', or
'functional' maybe. He's only muddying the carpet by
bringing us back to the concept of something being
'designed', if in fact he wants us to purge that concept
from our thoughts about Nature. On the other hand, this may
be symptomatic of something I noted late in the last
chapter: there, he wanted creativity to really exist, but
not really exist. 'Design' may fall in the same category,
especially if we consider the opinion he probably has of
TBW itself. That would explain why he isn't in such a great
hurry to flush the idea of 'design' from the system; it
would be too great a shock if he had to blatantly
reintroduce it later in defense of his own book's potential
validity.

Concerning his first two questions, from p 77 ("Could the
human eye have arisen directly from no eye at all, in a
single step?" "Could the human eye have arisen directly
from something slightly different from itself, something
that we may call X?"), I understand that as long as he's
merely defending one of two theories of biological
processes, these are good questions. But I ask the reader
to note that they both assume there are no other ways for
organisms to "have arisen" other than natural reactions.
That is, the very best such a line of questioning might be
able to establish, philosophically, would be that
philosophical naturalism is a viable contender. The
exclusion is presumed, so it cannot help prove exclusivity.

More importantly, though, Mr. Dawkins also slurs over
(again) the difference between probability and possibility.
Strictly speaking, even if "[t]he odds against a 'yes'
answer for questions like Question 1 are many billions of
times greater than the number of atoms in the universe," [p
77] the answer is still "clearly a decisive" _Yes_, not No.
Probability assumes possibility, and Question 1 only
concerns possibility: _Could_ X have arisen directly in a
single step? In the case of a macroscale system like the
history of nature, which has already produced definable
results, after-the-fact (a postiori) estimates of
probability are useless. Under _any_ imaginable conditions,
the actually produced history of the universe (which our
evolutionary development must in at least some sense be
linked to) is "gigantic and vanishingly improbable", if we
cast our minds back to (or near to) the beginning and
consider history as potentialities and possibilities.
Nevertheless, here we are. The actual history of the
universe is (practically by definition) possible; and here
on the grinding edge of history, it makes no technical
difference how improbable our current condition once was.
The assertion 'Species 'X' _cannot_ just pop into existence
from natural law, because it's grossly improbable,' is a
logical fallacy. Strictly speaking, we can't even say,
'Species 'X' cannot do this because the increasingly vast
amount of physical evidence we're finding regarding
vanished species illustrates that small steps are taken.'
This is because:

a.) If a species did pop suddenly into existence from the
evolutionary process (or from anywhere else for that
matter), the fossil record would probably be unable to
distinguish its emergence in that fashion. What sort of
definable traces would it leave behind in that venue to
show it popped into existence? There would just be another
skeleton with no traceable ancestor; and the 'missing link'
can always be assumed to have existed and we just haven't
found it yet. (Indeed, if we already _on other grounds_
know the process valid and intrinsically unalterable, this
would be the proper assumption to make.)

b.) Even if we had an utter and complete fossil record for
all currently-and-prior existent species in the universe's
history (which we don't, not even on earth), and they all
demonstrated that they were the product of small,
cumulative-step selection, what we know about genetic
mutations would _still_ render it possible (even if

vanishingly improbable) that such a thing could happen naturally--and it would have nothing to say about whether such things _could_ happen _supernaturally_.

Mainly what I'm picking on here is this: if Mr. Dawkins is going to present the argument, he needs to play fair and not claim more than it can account for. Put another way, he's assuming the answer to his target conclusion (Nature is an utterly interlocked and non-sentient system which produced us by cumulative-step selection) as the grounds for interpreting these questions.

Here's another way to illustrate my point. If there are atheistic scientists who are out there lobbying for the idea that Man is the result of an improbable genetic leap, the actual discussion at this point about probability wouldn't faze them anyway; the probability assumes the possibility, and hindsight estimates of comparative probability are a very flimsy means of building a foundation for refutational argument (refer back to my Chapter 3 discussion about lotteries.) On the other hand, the largest group of people who would assert that Man as a species didn't 'develop' in any protracted fashion are superfundamentalist creationistic theists; and they not only don't share the premises necessary for this part of Mr. Dawkins' argument to work (that Nature _is_, in fact, an inviolable interlocked system), they aren't claiming that Man just popped into existence from an improbable genetic leap. And meanwhile, in the case of someone like myself who thinks God exists, who thinks He designs and moderates Nature, and who thinks that He seems to have used a natural process called biological evolution to 'grow' us as a species--why should I be worried about this argument? I also don't share Mr. Dawkins' necessary philosophical premises, and neither do I require that Man definitely poofed into existence in one cataclysmic event (natural or otherwise.)

Mr. Dawkins' questions, therefore, don't cover all the bases; draw a false distinction between possibility and hindsight improbability; and _require_ as a _premise_ the conclusion which he's supposed to be arguing _to_.

Meanwhile, Mr. Dawkins' discussion on pp 77-78, of what he means by "walking a large distance across animal space", seems logically correct to me, as far as it goes. It's another good illustration of the principles of cumulative-

step selection. But now we're going to see a slurring between possibility and _certainty_ (instead of possibility and probability). It is _possible_ to imagine a series of small steps, sufficiently small enough that each step taken in turn is a genetically plausible alteration; and it is furthermore _possible_ to imagine that this series is long enough for something at one end to be very different from something at the other end. Combined with what we know about how genetics work, we may thus reasonably conclude that it is _possible_ that any given biological entity (such as ourselves) may be the end result of a process that started with something drastically different (assuming for the moment that we have no characteristics intrinsically undevelopable by the process). All this is fair and plain sailing, leaving aside the hidden assumption. But then comes Question 3:

p 78, "3. **Is** there a continuous series of Xs connecting the modern human eye to a state with no eye at all?" [italics mine]

Now we're slurring possibility with certainty. "It seems to me clear that the answer has to be yes," says Mr. Dawkins, and why? Because a very long time has passed in the history of our planet, and this process requires a very long time. True; but contention 3 also requires:

a.) that there is, in fact, no other possible means by which the human eye could get into that state, either naturally or supernaturally;

b.) or that these things did not, in fact, take place.

He assumes the answer is 'no' to the question of whether supernatural action could help; and at this point of his presentation he just assumes that a natural single-step event did not take place. (He also, functionally, assumes that genetics actually work the way he thinks they work, but I am presuming for sake of argument that he is correct about that.)

Let me try illustrating it another way. Let's take a coin, and let's say that we find it on edge, rolling across the floor. Let's also say that I'm trying to advance an argument showing that no one started that coin rolling, and that it got there by rolling on the floor an entire mile

with no intentional help. Now let's rephrase Mr. Dawkins'
questions in terms of the coin.

1.) Could the coin have gotten into this position without
rolling across the floor? I admit that it's naturally
possible that the coin could have fallen from somewhere and
just recently started rolling, but I point out that, if it
had done that, it's far more likely that it would have
just spun to a stop rather than actually begin rolling. I
then redefine improbability as impossibility, and answer
"clearly a decisive _no_." (I don't even bother trying to
point out that there's a coin track tailing off into the
distance which argues against a recent drop--maybe because
there are gaps in the trail which might provide grounds for
suspecting not-so-recent drops.)

Meanwhile, I ignore the possibility that by looking at
something other than the coin, I might see Mr. Dawkins
standing nearby--a person capable of dropping the coin in
such a way that it rolls, and probably of keeping it going
for a mile by various means if we in fact have a mile of
coin-track as evidence for that contention. I'm trying to
convince you that Mr. Dawkins is _not_ there, by drawing
your attention to the coin; but my "decisive _no_" to
Question 1 _requires_ that Mr. Dawkins not be there in the
first place, among other things.

2.) Could the coin have gotten into this position by
rolling a little ways across the floor? I note that at
every stage of the journey, there's a certain amount of
improbability that the coin would have made it any given
distance; but I also note that this improbability is
reduced if we think in terms of smaller steps. By helping
the reader to imagine these smaller steps, I help him get
past the improbability of the entire sequence. This is
important, because:

a.) I've already tried, back in Question 1, to equate
extreme improbability with impossibility, so now I've got
to backtrack and undo _that_ mental impression; and _this_
is necessary because:

b.) the entire sequence is _still_ highly improbable, no
matter how thin I slice it. In math it's called
multiplication of fractions; in logic, it's called
multiplication of hypotheses. Let's say I convince you, the
reader, that it's very probable (90%, say) that the coin,

at that speed and stability, could have made it a distance
of 'one inch' at any given segment of the coin-trail. So
it's also 90% probable that the coin could have made it
from two inches back to one inch back (a net distance of
'one inch'.) But the probability that it could have rolled
two inches to where we are now without falling over is
NOT 90%--it's 81%!

For the math-challenged, here's how that works. Go back to
my flipping coin. It can either be heads or tails: there's
a 50% chance on any single toss that it will be heads. I
flip it twice. Each flip, in and of itself, has a 50%
chance of showing up heads; but what are the chances that
it will _continue_ to show heads on both flips? It's not .5
+ .5: that would be 1.0 and that would mean there was a
100% chance of it being heads both times, which any of you
can discover for yourself isn't true! It's not .5 - .5,
because that would be 0, and that would mean there was a 0%
chance of ever being heads twice in a row--which again, you
can discover for yourself isn't true. Two heads doesn't
happen often, but it does happen occasionally. It's not
.5/.5 (50% divided by 50%): that equals 1.0 again (there
are various ways to illustrate this via mathematical
reasoning, but you can try it yourself on a calculator by
typing .5, the divide sign, .5 again, and equals.) And as
we just saw, that would mean 100% success, which we know
isn't true. What's left? .5 x .5; which is .25, or 25%.
There's a 25% chance that if I flip that coin twice, it
will be heads both times; and you can run some experiments
to verify this. Your experiments will not often actually
_be_ one double-head result every four double-flip
attempts; and this illustrates another problem in trying to
assert conclusions based on _prior_ probability. You might
actually get a run of seven double-heads in a row. It's
unarguably true that it _wasn't likely beforehand_ for you
to get that; but it's possible and you did get it, so a
discussion of how improbable it _was_ is now a moot point--
almost.

Because, that improbable result might raise your suspicions
about the coin being an honest coin, or it might raise _my_
suspicions that you're one of those people who are skilled
enough to make it land however you please. In fact, we've
been _ASSUMING_ that neither of these conditions exist; and
that's a pretty big assumption. Meanwhile, back to my
rolling coin. The odds it successfully travels one inch at
any given moment are 90% (I'm arbitrarily guessing, for

simplicity's sake--which is what Mr. Dawkins does in his
book). The odds it goes two inches without falling are .9 x
.9, which is .81, or 81%.

We're talking about a mile of inches in terms of the number
of 'steps' involved. That means the entire sequence's
probability is actually .9 times itself 63,360 times. The
probability continually approaches zero, and though it
'slows down', it never stops. My computer gave up the ghost
at .9^1980 (one thousand, nine hundred and eighty steps,
each of which had an individual probability of success
rated 90%), giving a result of 3/10^91 (3 divided by a 10
with ninety zeroes after it.) Applying the general fact
that for every doubling of steps after 495, the exponent
number comes very, very close to doubling in size (the
integer isn't a 'clean' 1, so there's some drag, so to
speak), the probability that a coin would roll a mile, if
after every successive inch it had a 90% chance of making
it another inch, would be about 3/10^2912 (3 divided by a
10 with _two thousand, nine hundred and eleven_ zeroes
after it.)

Now, this is actually NOT a problem for me, _if_ I'd been
playing fair to begin with, because improbability does not
equal impossibility, and the coin is definitely there
rolling on the floor. But, I can't have it both ways.
Essentially, I've got to look at other things besides
merely the probability to convince you that the coin rolled
a mile without Mr. Dawkins to help it or start it. For
instance, I could note that the floor isn't level: it's
sloped at a gradual angle--not too steep, not too shallow.
And I could note the floor is smooth. In fact, I'd've had
to have noted that before, or else my attempt at giving you
a high probability estimate for an inch of successful
travel would not have worked anyway! This corresponds to
Mr. Dawkins' Chapter 3 discussion on genetic hyperspace
behavior. But it shouldn't do much for my attempt to
convince you Mr. Dawkins didn't start the coin rolling
himself and wasn't helping. Does the existence of the
smooth downward slope necessarily mean he never had to help
and/or never did? Am I taking into account the question of
whether _he_ made the floor smooth and gently graded? That
would certainly count as 'help', even if he did nothing
else!

Of course, if I'm playing fair, I also don't have to worry
about someone else saying 'But if we do the math, it's

still grossly improbable that the coin got there without
help! Therefore, Mr. Dawkins must've helped.' That doesn't
work, because the coin _is_ there and it _is_ possible
(though vanishingly improbable) that Mr. Dawkins didn't
help it get there--that it rolled the whole mile downhill
itself. Therefore we don't _have_ to conclude, on that
evidence, that he helped. But, I'm _not_ playing fair;
because back in Question 1 I tried to convince you that
vast improbability=impossibility. I am, in fact, playing a
double-standard for my own convenience.

This also becomes apparent if I reply to my critic, "Now
wait a minute! You're criticising me on single-step
selection instead of cumulative-step selection!"
Unfortunately, multiplication of probability follows from
cumulative-step selection. I (i.e., Mr. Dawkins) want to
convince you to accept a probability characteristic of
single-step selection (e.g., one little change isn't all
that improbable), and apply it to a _cumulative-step_
selection process. Again, if I were playing fair, this
wouldn't be necessary, for several reasons; one of which is
that I should already have argued (as Mr. Dawkins has, in a
sense successfully) that there are constraints on that coin
which tend to override probability considerations. But, I
want to get the reader away from that, if possible; because
I haven't _really_ argued yet that Mr. Dawkins standing
nearby (i.e., God) _isn't_ one of those constraints on my
successfully rolling coin; and as long as we're talking
about probability-busting constraints, Mr. Dawkins (for all
we can see to the contrary so far, which is in fact nothing
to the contrary so far!) might be one of them. And I'm not
satisfied with that; I'm trying to convince the reader that
Mr. Dawkins doesn't exist by showing how well that coin
rolls without him. And so I need something more basic about
the intrinsic ability of that rolling coin than outside
constraints; and since I've already confused improbability
with impossibility, I need to somehow make that rolling
coin theory seem intrinsically probable. Thus, my circular
logic leads to a cruel dilemma. Fortunately, it's also
labrythine, so maybe the reader won't pick up on it!

On to question 3, "**Is** there a continuous series of
small increments that the coin travelled in?" It seems
clear to me, I say, that the answer _has to be_ 'Yes'. Why?
Well... um.... because, there would have to be a mile of
space for the coin to travel a mile, and there is a mile of
space. And the coin _couldn't_ have been just dropped (not

just _probably wasn't_ just dropped) because... well, okay
I'm assuming that. And it's improbable that the coin would
have reached this point without help, which means that it
certainly didn't--well, no, that's not what I want to
say... I'd better switch standards again and ignore that
contention. But it _is_ probable that it could travel an
inch without help, and so only those continuous small
increments keep it from becoming vanishingly improbable...
um, well, no actually they don't. But it is _possible_,
given all these other things, that it happened. And don't
forget that mile of space, that's very important. Just
think about how many inches are in that mile: thousands,
and thousands, and thousands. Isn't that awe-inspiring?
Therefore, it certainly must have happened. So, where are
we?

p 78, I'm combining our two examples together here, but
this is the first sentence of the last paragraph on this
page. Italics are mine.

"So far, by a process of more-or-less abstract reasoning,
we have **concluded** that there **is** a series of
imaginable [increments of distance], each sufficiently
[small enough] that [a coin of such-and-such intertia and
velocity] could plausibly [travel it without falling over
and without being helped], the whole series [of incremental
steps] linking [the coin's current position and vector
characteristics] back to [a drastically different position
one mile further up the hill.]"

Yeah! Concluded that there _is_! By... er... more-or-less
abstract reasoning.

Well, I guess I'll agree with the 'more-or-less' part--by
now you should know which side of that range I favor! You
will note that I've left out a concept equivalent to the
effect of random mutation, which is an integral part of
biological evolution. I'll leave it as an exercise for the
reader to figure out whether this helps or harms (or has no
effect on) how accurate my analogy is.

And before we continue, please note: my lampoon above is
not intended to discredit biological evolutionary theory,
per se. Part of my gripe with Mr. Dawkins' methodology is
that evolutionary theory deserves a good argument in favor
of it, and he's presenting one with holes big enough to
drive a dodo through; and I think there's a suspicious and

invalid reason for this: if he gave it the most fair and
reasonable treatment possible, the argument wouldn't serve
his philosophical agenda. It would leave open all kinds of
things that he's otherwise presuming closed, and towards
which he's supposed to be arguing. Thus, I think that his
attempt at making biological evolution serve a purpose
which it cannot logically serve, really results in a poorer
argument in favor of biological evolution itself.

Moving on to Question 4:

p 79, "4. Considering each member of the series of
hypothetical Xs connecting the human eye to no eye at all,
is it **plausible** that every one of them was made
available by random mutation of its predecessor?" [italics
mine]

As Mr. Dawkins notes (pretty fairly), "This is really a
question of embryology, not genetics; and it is an entirely
separate question from the one that worried the Bishop of
Birmingham." But there's another question that must be
answered first: "Is it _possible_", not "Is it plausible".
I think the answer is yes, for what it's worth (ignoring
supernatural influence for purposes of argument), but we've
sort of skipped that part. And once it's possible, the
question of its plausibility is almost a moot point; it's
here, it doesn't have to be plausible. The implausibility
might lead us to ask whether something _else_ could have
helped, but by itself it wouldn't definitely demonstrate
that something else _did_. Since the answer to the
technicalities of Question 4 will be deferred by Mr.
Dawkins until Chapter 11 ("Doomed Rivals"... ooo, scary!),
it should really be discounted or held in abeyance. But, of
course, he thinks that he can "at least see that the
smaller we make the difference between any given [stage] X'
and X'', the smaller will be the problems." [p 79] My
opinion about this is recorded at length above. Even Mr.
Dawkins gets a little waffly here (justifiably so!): "My
feeling is that, provided [such-n-such], the necessary
mutations are **almost** bound to be forthcoming." [p 79,
italics mine] So don't take his answer to that question
about the _certainty_ (#3) too seriously, yet!

p 79, "5. Considering each member of the series of Xs,
connecting the human eye to no eye at all, is it plausible
that every one of them worked sufficiently well that it

assisted the survival and reproduction of the animals
concerned?"

Again, this could have been a simple "yes", with good
biological grounding, had he simply stuck to "possible" and
not been bluffed by the shadow of plausibility. But, no; we
have to have "plausible" instead--and it's a moot point.
ASSUMING what he's trying to prove, then we may in
hindsight say it's quite _plausible_ that every single step
connecting the human eye to no eye at all assisted the
survival and reproduction of the animals concerned. But it
need not be certain; I myself, like an increasing number of
humans, suffer from myopia (that's near-sightedness).
Apparently, there's a gene sequence which tends to crop up
pretty quickly in humans (at least in Caucasian humans)
producing near-sightedness unless environmental constraints
prevent it. Thanks to scientific and cultural effects
(glasses, contact lens, the decrease of social stigma
attached to glasses), this gene switch can proliferate
without drastically decreasing the likelyhood of its
carrier's ability to replicate and reproduce (find food and
a mate.) Nevertheless, this small step is _not_ assisting
me. There are even other possible small steps that could
have been neutral (variable iris colors would be one, I
guess) that still spread because they happened to piggy-
back on some other development that _did_ help.

But this is all on the assumption that the process he's
trying to prove actually exists and works the way he says
it does. _Assuming_ the human eye developed from no eye at
all, and _assuming_ that it did so by blind cumulative-
step, non-designed processes, is it plausible every one of
them worked sufficiently well? Well, duh! Of course: here
are our eyes. If the vast majority of the changes hadn't
worked sufficiently well, our eyes wouldn't be here with
these characteristics.

Let's put the question another way, same principles,
different assumptions: assuming that God exists and is
omnipotent and omniscient, and assuming that He designed
and created human beings (either by cataclysmic event or
gradual process or a mixture of the two), is it _plausible_
that our eyes would "work sufficiently well?" The answer,
of course, is 'Duh!' And, like above, it's a moot point on
other grounds; I don't have very good eyes myself, but that
doesn't affect the contention (it only has to be
'plausible', not certain). I seriously doubt Mr. Dawkins

would accept this method as a valid part of a cogent argument in favor of God's existence and character. Mr. Dawkins is, in fact (drumroll, please!), using the Argument from Design methodology, except for different purposes. Maybe Mr. Dawkins should switch his book's subtitle to "Why The Argument From Design Reveals A Universe Without Design"!

p 79, "I choose this book [Hitching's, to quote from] because a reputable publisher (Pan Books Ltd) saw fit to publish it, despite a very large number of errors which would quickly have been spotted if an unemployed biology graduate, or indeed undergraduate, had been asked to glance through the manuscript."

This quote was just too ironically funny to pass up, all things considered. However, Mr. Dawkins does (to be fair) pretty accurately crush the rebuttal presented from Mr. Hitching's book (assuming he quoted in context, of course.) Read pp 80-81 for an example of _good_ arguing from Mr. Dawkins; he says it much better than I can (and then go back and compare my objection to the ones raised by Hitchings and Gould. They aren't the same; Mr. Dawkins and I are actually on the same side, here.) This is what happens when people misuse plausibility, possibility and certainty on the _other_ side. Too bad Mr. Dawkins apparently accepts their methodology (through which the error originally came anyway).

Most of p 81 seems on track logically (though we get another statement that "These resemblances [of animals to sticks and leaves] are far more impressive than the resemblance of clouds to weasels." Why more impressive? 'Just because', I guess.) In the first sentence at the bottom of p 81, we get:

"We use the word 'mimicry' for these cases, not because we think that the animals consciously imitate other things, but because natural selection has favoured those individuals..."

The important things to note in passing here, are a.) another implication that the animals are _not_ conscious, and b.) another implication that _we are_. This is just to remind everyone that whatever else Mr. Dawkins intends to do, he cannot end up concluding that _we_ don't actually think. He himself can also apparently draw clear

distinctions between the concepts of 'reason' and 'non-reason'; so if he tries to blur them together again later for purposes of convenience, he'll be implicitly contradicting himself.

Sort of a weird sentence at the bottom of p 81:

"Ancestors of stick insects that did not resemble sticks did not leave descendants."

This sentence doesn't make sense on several levels. First, according to the whole point of biological evolutionary process, genetic mutants are born (thanks to random shifts in genetic code) that have characteristics the parents don't, and if those characteristics help them surivive (not all do) and no accidents happen, they're more likely to breed and pass on the new gene sequence. That means, strictly speaking, that ancestors of stick insects actually _did not_ resemble sticks themselves. That's THE WHOLE POINT!! He _can't_ mean what he says, here. If biological evolution is true, stick insects developed from ancestors that didn't resemble sticks (and it explains how they did this.) Mr. Dawkins now says that if the ancestors didn't resemble sticks themselves, they didn't leave descendants; which pretty much puts the kibosh on the stick insects, according to biological evolution.

Worse, if (per impossibility) this sentence could be shown to be true, and it really reflected biological evolution, then there would be no species except stick insects. "Ancestors of stick insects that did not resemble sticks" pretty much has to include, in the long run, the biological ancestors of us all. I'd say they didn't look like sticks. If the sentence were true, they wouldn't have left descendants, and we wouldn't be here.

This is not an argument against biological evolution; just another piece of evidence that Mr. Dawkins isn't quite thinking out what he writes. (It's also possible this is just a composition error, but it still needs to be corrected.) What he has to mean is, 'Ancestors of stick insects that did not resemble sticks mostly left descendants that did not resemble sticks, and left a few that did. The majority that did not look like sticks went on to pass their gene structure until new mutations occured, or environmental conditions precipitated their extinction. The few that did look a little like sticks,

went on to have a bunch of descendants that looked a little
like sticks, and a few descendants that looked a little
more like sticks. All these descendants were in competition
for limited resources, but the stick ones had an increasing
advantage. If the resources were limited enough, and
nothing accidental happened, over time most of the branches
of insects (pardon the necessary pun) that didn't look like
sticks died off. If the resources weren't that limited, we
now have 50 species of insects, all descended from the same
ancestor(s), some of whom look like sticks, some of whom
don't, and some of whom look more like sticks (or like
different sticks) than others.' That's what biological
evolution says. More wordy than the other, but more precise
(and less open to hostile criticism.)

Notwithstanding this, Mr. Dawkins argues somewhat better on
pp 82-83, responding to a more formidible opponent,
Goldschmidt. He has a bit of real challenge, here,
responding to the question of how small incremental changes
in shape could have been significant enough to eventually
allow a cumulatively large change in shape. He introduces a
few options, and disposes of them--not always by argument,
sometimes by assertion. When, on the bottom of 82, he
brings up the theory that incremental improvements in bird
vision have been increasing at more-or-less the same rate
as incremental improvements of turd-resemblance in their
usual insect prey, he dismisses this with "That is not the
kind of answer I want to give", and an asserted implication
that the vision of the species bird he has in mind has
remained pretty much constant throughout the evolution of
the turd-bug. It would probably have been better to say, if
that _is_ the case, 'This doesn't seem likely because we
have good reason to believe the insects developed over
such-n-such span of time, and we have good reason to
believe the eyesight of this bird was stable and very
efficient throughout that period: and _here are the
reasons_.' But, he doesn't. He just sort of leaves us
hanging. He could really strengthen his example here by
giving us laymen an illustration of how biologists reach
these conclusions.

But his reply on pp 83-84 is much better, and reminds us
that there is no such thing as a static, standard
'situation' where a predator sees a potential meal. There
are a wide variety of such situations, and a slightly more
stick-like resemblance spread across a wide number of
insects, would save them in those fringe situations. If

that insect ever becomes the standard (or even if it
doesn't), the next favorable mutation (assuming it's
favorable, which is a big assumption) would allow the
'fringe' to shrink a bit more; now the descendants are
safer in a few more situations where they would have
probably been killed otherwise. One thing about this
example which bothers me a bit: for it to work, it seems
any given genetic mutation would have to be spread through
a large population from the getgo. I say this because a
slight change in the shape of one bug means only an equally
slightly better chance that the bug survives long enough to
replicate. Given the high mortality rate of insects (that's
why most insects lay thousands of eggs per adult), most
mutations--even positive ones--probabilistically never get
put into the gene pool.

Perhaps this isn't a problem for insects; maybe a single
insect's given clutch or spawn all come from a single
fertilized egg (or the insectile equivalent), and thus are
all what we would call identical twins. Maybe the same vast
reproduction rate for insects, which I just mentioned,
offsets the problem by providing proportionately more
positive mutations per given timespan (I suspect this is
the better answer.) I don't know. I hope Mr. Dawkins gets
back to that. (Hindight note: he doesn't.) Also, I'm not
implying this would be an objection under other
circumstances--different species with different
reproductive patterns (like us, for instance) would, by
definition, have different patterns of evolution.

pp 84-85 continue with some more decent argumentation. (He
seems to work most sensibly when actually dealing with
biology and not philosophy, or when not hamstringing his
own biological arguments by trying to phrase them in a way
that keeps the philosophy 'going', to his own mind.) We
still get the usual flat, sweeping categorization: "We have
now seen the silliness of the anti-evolutionist's
assumption that the answer is an obvious no." [p 85] Like
there can only be one kind of opponent to any sort of
evolutionistic proposition, and that opponent will always
assume the answer to Question 5 is no, instead of yes.
(Well, _I_ answered "yes", though not quite for the same
reasons Mr. Dawkins did. Does that mean I accept all
conclusions labelled 'evolutionistic'? Pshaww, as we say in
the "backwoods".)

But things go swimmingly for a while, through the nautilus
example on the bottom of p 85: Mr. Dawkins even admits a
bit of worry about why the nautilus hasn't evolved to the
next step yet. This sheds a bit more light on his
misconception of probability, possiblity and certainty.
Assuming the change is possible, the nautilus has had loads
of genetic time to randomly evolve the next step (I
presume--he doesn't give details here). It hasn't happened
yet. Mr. Dawkins, not unreasonably, wonders if this means
it actually _isn't_ possible (due to the embryologic
gestation of the nautilus) for the mutation to take place.
But really, this shouldn't be much to worry about.
Probability is not certainty, and it's only merely probable
that the nautilus will take one more step in animal space.
(Mr. Dawkins and I are both slurring over the idea that the
step is up to the nautilus as individuals or species. It's
actually not, but we have to speak metaphorically. The
question is which of us remembers that when the time
comes!)

But a vast number of other species have taken similar
steps. So what? As long as it's possible for the nautilus
to _not_ evolve one more step, it's possible. In fact, one
would expect 'problems' like the nautilus anyway under Mr.
Dawkins' theorem; out of a billion species that seem to be
evolving along pretty steadily, here's one that isn't. It
just hasn't happened yet; it might never happen. As long as
we're talking probability and not certainty, we may expect
exceptions. This could be one. Of course, since the result
_is_ improbable, yet nevertheless here, it won't hurt to
try to _find out_ if it is actually impossible. It might
be; it's hard to tell the difference between impossibility
and improbability just by looking at it. This is where we
want, and can use, 'a frame of reference, multiple
examples, and a prior thorough knowledge of the principles
of the system', as I noted in the coin example at the
beginning of Chapter 3. We've got a frame of reference
(biological evolutionary process itself), we've got
multiple examples; Mr. Dawkins justly suspects that we
don't have a thorough enough knowledge of the principles of
the system (in this case, nautilitic embryology.)

Let the reader note, though: biological evolutionary theory
itself cannot be analyzed by the same method, under
naturalistic philosophy. It's doubtful we have a useable
frame of reference: if we are not in some fashion separate
from the frame, how can we judge what is probable or

improbable or even impossible within it? We don't have
multiple examples: the universe's history has only happened
once, and unless we start by _assuming_ that Nature is
uniform in this fashion, we can't be certain that what
appears to us to be fixed laws are actually invariable. And
we don't have a prior thorough knowledge of the system: it
can't be prior, because we're part of the system, and the
question of whether it's thorough enough is a very sticky
one if we're judging that only from within the system.

On the other hand, most of these problems disappear under
supernaturalistic theistic philosophy. Nature itself might
serve as a useable frame of reference because we are
outside the system enough to be at least partially free of
its automatic, non-sentient influence (not all of us are:
chronic sufferers of manic-depression, for instance, are
hampered in their ability to form cogent ideas while under
the domination of the physically-manifested poles of their
behavior). We don't have multiple examples, and must still
assume Nature is uniform, but (as I'll get to later), this
assumption follows much more easily from theistic
philosophy than naturalistic philosophy. We have laws
'prior' to Nature through which we can now, with at least
some hope of success, analyze nature (logic must preceed
any theory or the theory falls). The question of how much
knowledge is 'thorough enough' to make judgements about the
system is still fairly hefty, but we don't have to worry
about the potential infinity of Nature. As long as Nature
is effectively infinite, it's impossible to tell how much
of it we need to know to make valid judgements about it _as
a whole_. It's still tough to know in a finite Nature, but
at least we have some hope that what we do know holds true.

The particularly astute reader will note that this last
issue might, in the long run, nix a theist's hope that his
understanding of God is valid. But, it's theoretically
possible for God to give us information about Himself
through finite means--a choice of divine abdication that an
infinite yet non-sentient Nature would lack as an option.
In other words, if we wanted to understand God, He'd have
to actively design the means for us to do it into Nature
itself, both as an organ (e.g., our brain) which can
perceive necessary connections and which can consciously
(without total dependence on pure reaction) recognize and
reject non-connections; and through Natural material itself
(e.g., the shadows of God which various theists,
polytheists, pantheists and dualists have seen by means of

the characteristics of Nature and by which we build up
composite 'pictures' of Him through metaphor and allegory.)
Under this same paradigm, the best possible information
would only come if God Himself, the actual Final Ground of
all existence, made _Himself_ (as Himself) in some sense
finite. Seems like there was an old story along those
lines... But that gets into a historical question, not just
a philosophical one, which is way beyond the scope of my
book. Meanwhile, back to the nautilus.

p 86 continues with good trains of thought (yes, even up to
and including his discussion of some more misused "anti-
evolution propaganda", as he calls it.) There is one more
comment on this page I want to call the reader's attention
to, though. It's not exactly a logical mistake, but it
might leave the wrong impression:

"Once such a crude proto-lens is there, there is a
continuously graded series of improvements, thickening it
and making it more transparent and less distorting, the
trend cumulating in what we would all recognize as a true
lens."

What Mr. Dawkins (perhaps accidentally) isn't taking into
account, is the assumption that the nautilus' environment
remains constant enough for this process to be always an
improvement. I think we can grant that once any given
useful alteration has been made, un-useful alterations will
not survive long in the species--unless of course they
piggy-back some other more useful alteration, or the
alteration in question no longer has an effective bearing
on the individual's chances of replication (like the
current general trend toward near-sightedness in at least
some parts of humanity). But, that also assumes that
environmental conditions will always remain such for the
nautilus, that a lens increasingly like ours would in fact
help. But the conditions might not remain that way. If they
change, then though we'll still have to agree that further
successful changes will be (by virtue of their
successfulness) "improvements", they might not be what _we_
would necessarily call improvements. (Hindsight note: Mr.
Dawkins himself discusses this further, and corrects some
of my impressions, at least once in Chapter 5.)

Okay, but so what? Well, an earlier philosophy known as
developmentalism (which eventually borrowed from both
biological evolutionary theory and philosophical

evolutionism) worked on the presumption that all facets of
reality were under some kind of intrinsic drive toward
'improvement'. Its adherents tended to ignore

a.) that the conception of 'better' being used as the
standard was itself based on purely sociological and
environmental _perceptions_ (themselves often predetermined
by the developmentalists' prior philosophy) and thus not
necessarily objective; and

b.) the environment doesn't always naturally support this
kind of standard.

The developmentalists would then use these selections of
'improvement' theory to justify things like the Holocaust
(to use an extreme and well-known example, though not all
developmentalists were this extreme.) They insisted not
only that Nature _was_ going this way, but that it _should_
go this way; and therefore anything which impeded (or could
be somehow painted as 'impeding') this development needed
to be stopped with no restrictions on what it took to stop
it. This is one way how Hitler's racial purges (not limited
to Jews, though they were the most famous example) were
successfully sold.

Actually, the philosophy is older than evolutionary theory
or evolutionism, either one. The justification methodology
can be traced to various Imperial Expansions throughout
history, (including the United States' Manifest Destiny
rhetoric during the 19th century), and even in a fashion to
the purges of various religions (which, I'm sad to say,
Christianity partook of for centuries.) The popular works
Hyperion by Keats, and _The Ring Cycle_ by Wagner, are
both quite saturated with this sort of thought, and were
very popular throughout Europe _before_ the publication of
The Origin of Species. I actually think that by now, this
sort of thing no longer makes a part of biological
evolutionary thought, or even philosophical evolutionism
(which I think makes either claim stronger); but it could
always come back, and I think a warning about its
weaknesses (and attendent potential horrors) is always in
order when discussing this topic. The particular quote I
used above just gave me a good excuse; I'm _not_ charging
that Mr. Dawkins is advocating this idea! (Hindsight note:
In fact, on p 94 he implicitly disavows developmentalistic
philosophy, as such, when he castigates "a lot of
idealistic nonsense about the inevitability of progress".)

p 86, "Nautilus's relatives, the squids and octopuses, have
a true lens, very like ours although their ancestors
certainly evolved the whole camera-eye principle
completely independently of ours." [italics mine]

If the reader takes this to mean (as I assume Mr. Dawkins
intends) that we form no close branch in species to the
mollusks, then this sentence stands. But remember that,
strictly speaking, there are (at least) two ways in which
the octopi/squid species didn't _quite_ evolve "the whole
camera-eye principle _completely_ independent of ours."
First, the same physical principles (I mean of light and
reflection and refraction) which make a camera-eye more
useful to its 'owner' are by and large the same for us as
for the mollusks (with some few differences resultant on
how these physical principles play out in a different
environment.) And second, many evolutionists (though
perhaps not all) believe that all living species can in
principle be traced back to a single proto-species (viral,
bacterial, or what-have-you.) In either sense, then, there
is not a _complete_ discontinuity between parallel
developments. In fact, this is exactly what biological
evolution, and philosophical evolutionism, posit. Of
course, Mr. Dawkins doesn't _really_ mean _completely_
independent either, as he notes in the paragraph spanning
pp 95-96. It's just a bit of sloppy description (but in a
work where he attempts to fuse philosophy and science to
overthrow a belief with 2000+ years of sociological impact-
-as well as much stronger philosophical and historical
groundings than he's giving it credit for--he can't really
afford to be sloppy.)

pp 86-87 provide an amusing refutation (on target, this
time) by Mr. Dawkins against another claim from Hitching's
The Neck of the Giraffe. He does leave out a bit of
information (probably accidental) which the reader must
deduce: the bombadier beetle doesn't add the catalyst
within its own body, but sprays the catalyst in a
dovetailing stream along with the peroxide/quinine mix. (At
least, I assume that's what happens from piecing together
Mr. Dawkins' description. I know from personal experience
that this is how the reactive chemicals in fiberglass
reinforced plastics are combined without jeapordizing the
system integrity. I also know from personal experience what
happens if they combine in the mixing chamber by accident!)

Mr. Dawkins provides an even better illustration of the refutal of improper argumentation against evolutionary theory, through the middle of page 89, by picking apart Hitching's question: "What use would be half a lung?" He does, however, include one peculiar statement:

p 87, "This transition [from two branching tips to about 300 million branching tips, which is the number of tiny chambers in each healthy adult human lung] can be accomplished in 29 branchings [in terms of genetic code], which we may **naively** think of as a stately walk of 29 steps across genetic space." [italics mine]

Huh?! I suppose I must fall back on the AfPI: I don't understand in the least why Mr. Dawkins (of all people!) would ascribe the charge of 'naiviety' to someone who thought of that concept as a stately walk of 29 steps across genetic space. (This is a quote directly from Mr. Dawkins, not from Hitchings.) Is it "naive" because those 29 steps actually took, say, 500 million years? No, he doesn't say that (and I'm not sure why it would be naive in that case anyway.) Is it "naive" because it's more reasonable to believe it might have occured even faster in three steps? No, the recurring theme on the next two pages regarding this topic is a "**gradual**, step-by-step change." [italics mine] Is it "naive" because he hasn't written the word "naive" in a while, and he just needs to get it in near a discussion of Hitchings, even if it applies to a position he himself appears to be arguing _for_?? Maybe it's a cut-and-paste blip left over from a previous version of the sentence, and neither he nor his editor(s) caught it. These things happen--but if I can trust my own ability at textual analyis, it doesn't _look_ like that kind of error: it fits in too well with the sentence structure. (But of course, that might also explain why it wasn't caught.) Anyway, something for future revision to remove, or at least explain.

One thing Mr. Dawkins doesn't bring up in refutation of Hitchings, that I expected him to try (it would have been a good refutation, too!), is that there _are_ in fact some species with what we might call one-and-a-half lungs: snakes being one of these species, if I recall correctly. Hitching's argument regarding half-lungs, therefore, wouldn't work even in defense of a near-instantaenous creationistic philosophy (e.g., a literal six days in Genesis), because God apparently saw fit to design the

snake with half a lung! (Or perhaps He gave it that as some
non-Scripturally-based punishment for tempting Eve?) And it
works just fine; better, in fact, than two lungs would
inside the snake's elongated and flexible body. (Also, I
have a hard time figuring out what 'half-a-lung' would look
like. One of the snake's lungs is half-_sized_, compared to
its other lung, but the snake certainly doesn't have an
organ that looks like a lung chopped in two!)

Some more trivial bits of data to add to Mr. Dawkins'
discussion on these pages:

p 88, "An animal without an air bladder inside it is
normally slightly heavier than water, so sinks to the
bottom. This is why sharks have to swim continuously to
stop themselves from sinking."

It's also why sharks belch to help effect radical depth
changes. No kidding! If a shark wants to go deeper quicker,
it'll burp. If you want to try it out yourself (I used to
do this as a kid), hop in a pool with a deep end, go
underwater, and slowly let out the air in your lungs.
You'll start sinking like a rock. WARNING! Don't do this
unless you are extremely competent at getting back up
again! You won't have the natural ballast in your lungs to
help you, and of course you'll have much less oxygen in
your lungs to help you survive underwater! But if you're a
strong swimmer and have access to a pool not-too-deep
(preferably with a lifeguard around) you can try the shark-
burping technique.

p 89, "Any tendency to increase the ratio of surface area
to weight would help [make a body somewhat more
aereodynamic], for example flaps of skin growing out in the
angles of joints."

You can see a variation of this process in the North
American flying squirrel (Hindsight note: Mr. Dawkins
mentions animals like them on p 90.) You can also see a
prior step in this technique in any cat (or regular
squirrel, for that matter): if you drop a cat from a
distance greater than she can safely land on her feet, her
legs will spread out and the loose skin between the joints
will help reduce her falling airspeed. Spreading out her
body like that also redistributes the force-vectors of the
impact across a wider area, further helped by a larger
cross-section of cushioning fur and the usual mammal's

compressibility of the rib-cage (a heightened trait in cats.) There are documented cases of cats in cities suriving 30+ story falls with nothing worse than (for instance) a partially collapsed lung and a broken tooth. WARNING! Do not try this yourself unless you are sure your cat won't maim you when you aren't looking. I may have been fool enough to try the shark-belching thing when I was a kid, but I was _never_ foolish enough to test the falling-cat effect!

Well, after several pages of good biological argument, we get yet another flat (and rather blatant) example of Mr. Dawkins himself applying to the AfPI in terms of a Designer:

p 92, "No sensible designer would have conceived such a monstrosity [as a flatfish] if given a free hand to create a flatfish on a clean drawing board."

Sigh. Here we go again. And why is that, Mr. Dawkins?

"I suspect that most sensible designers would think in terms of something more like a skate." [p 92, immediately following sentence.]

Because, of course, the flatfish is far more inefficient at filling a niche in the ocean's ecosystem than the differently flattened skate? No, that's demonstrably not true, as even Mr. Dawkins attests to in following paragraphs. Because flatfish look ugly and deformed? No, that's a purely subjective, aesthetic criteria. Because...? But there's no point wasting my time thinking of facetious "Becauses"; the fact is that Mr. Dawkins gives **NO** good reason for this bald assertion--except the implied reason that any and every conceivable attempt must be made to turn the reader away from considering a creationistic philosophy, even if the attempt is invalid and nonsensical. If the reader can be made to consider creationistic philosophers "cavemen" (as Asimov says in his jacket-blurb attestation) by appealing to "monstrosities" of design or "violations" of natural law, then that's what Mr. Dawkins intends to do. The question is whether the reader is going to buy this, especially in light of Mr. Dawkins' own low opinion of similar tactics from "anti-evolution propaganda". Apparently Professor Michael Ruse bought it, according to his review excerpt on TBW's opening pages: "The closest analogy I can think of [to TBW] is Galileo's

Dialogues... and I hope I will not be thought to be pushing
things to an embarrasing point if I say that Dawkins' book
can be compared to Galileo's, not only in type but in
standard." This is what scholarship has come to at the end
of the twentieth century: a pile of circular reasonings,
beggings of the question, category errors and unsupported
appeals to emotion being "compared to Galileo's [work], not
only in type but in standard." Sometimes no comment seems
sarcastic enough.

Having tossed in his requisite occasional 'bon mot', Mr.
Dawkins continues through the bottom of p 94 with a
discussion about how it is quite possible for general
evolutionistic trends to reverse themselves, though the
probability of any given 'tracing' going more than once
through the same 'genetic space' path is vanishingly small.
This is why parallel evolution of certain features (octopus
'eyes' versus human 'eyes') are not quite functionally
similar in detail. Having set up this topic, he continues
through the end of the chapter (quite a few pages,
actually, through p 109) on this subject.

On p 97, we get a "delightful suggestion" (and I agree it
is!) that dolphins and bats have a potentially effortless
means of communicating mental pictures to one another by
mimicking echoes. There's no evidence for this suggestion
yet (as Mr. Dawkins says), but between the two animals,
dolphins seem more likely "because they are in general more
social. They are also probably 'cleverer', but this isn't
necessarily a relevant consideration."

Really? How could it _not_ be a relevant consideration in
terms of probability or possibility? It certainly doesn't
necessarily mean they _are_ doing it, but to discount it as
not necessarily being relevant seems awfully arbitrary (at
least in the absence of any statement explaining why.) It
would be like saying that the bulging dome on the front of
the dolphin's head is not necessarily a relevant
consideration regarding its echolocation ability, despite
the fact that we know enough about such principles to
recognize (or at least imagine) a potential benefit
conferred by it for that purpose! Wouldn't it be highly
relevant to consider it, even if the answer turned out
different from what we thought? Clues like this are part of
how we advance from knowing less to knowing more. (Probably
what Mr. Dawkins meant was simply that even if dolphins are

cleverer than bats, we need not exclude the bats from
contention.)

p 97, "We cannot as subjective human beings empathize with
electric fish, but we can, as physicists, understand them."

After reading this, I decided it would be an interesting
mental puzzle to try finding subjective experiences to help
us empathize with electric fish. This is purely a trivial
side-issue, so you may skip the next four paragraphs if you
merely want to stick with specific 'criticism'.

Almost every reader will have a computer monitor or
television screen; turn it on and wave your hand near it.
The gentle static electricity which surrounds the tube
provides a clumsy (yet certainly discernible) means for us
to 'feel' an electrical field. Some people, like myself,
can even 'hear' a phototube when it's turned on; I'm not
sure whether I'm detecting the electrical field or if I'm
really hearing a slight, high-pitched sound coming from the
tube (it's very stable and demonstrably connected to the
frequency of the wiggler of the photon gun in the screen),
but it's still an electrical field detection. I'm fairly
confident I could find an activated computer monitor (or
even several) in a room while blindfolded. Of course, other
electrical apparatus nearby can mess this up, and I'm not
sure whether it would work in a high-noise environment.

Yet another way to empathize with the fish might be to
think in terms of our ability to detect heat energy (say,
from a lamp or the sun.) I don't think the sensory parallel
is as good as with the computer monitor, but it's
indisputably raw energy being sensed. Electrical fish may
have a similar 'feeling'; the bioneural reactions which are
pressed into service to relay information to us in the case
of heat energy (or sound energy, or photonic energy, or
kinetic energy, or what-have-you) may be pressed into
service to supply information from this source. Refer back
to Mr. Dawkins' discussion in Chapter 2 about how bats
might be able to 'see' sound echoes. (Particularly the top
of p 35.)

The main problem with my examples so far is that the actual
detection method of electric fish works more like a force-
field or floodlight coming from the fish itself! (I'm told
that the electrosensitve system of sharks works a bit more
like what I described above.) It would be like being able

to glow in the dark, and then navigating a room by that glow. Or, a little more properly, imagine a thin sheet of water falling on your body. Even with your eyes closed, you could tell if something interrupts that plane of water, because water will no longer fall on that part of your body! You can get an idea of where it is, and (within the context of that plane of interruption) how big, and whether it was moving relative to your body. The electric fish wouldn't have a thin sheet of 'something' falling on it, but a continuous three-dimensional shape; and in this case, it's 'squirting' the material (ie, the electrical field, which is comprised of moving electrons) out of itself in such a manner that it 'falls back' onto its body. An interruption in the field could easily give size, shape, position, relative velocity, and other basic information. I presume it would also be easy to find a mate that way (other electrical fields from the same species could be distinctive.)

But of course, no single picture really does the reality justice; and putting them all together only gives us a start at empathizing. But, a start is better than nothing. Compare Mr. Dawkins' description of the process on p 98 for more (and better) technical details.

p 98, "Once again, this doesn't have to mean that the fish are clever mathematicians. They have an apparatus that solves the necessary equations, just as our brains unconsciously solve equations every time we catch a ball."

If we're going to bring up this comparison, we might as well take account of the whole picture. There may be (and probably are) a fortunate few humans who are gifted at birth with the ability to catch balls unconsciously; but the rest of us have to train. A good deal of this training is conscious manipulation of our environment. It doesn't _have_ to be; a person living in a swamp, for instance, may get very good at swatting mosquitoes simply because the timing and muscular tone required for successful swats are built up by instinctive reactions. But the swats don't have to be instinctive, either--and neither does ball catching. If most of us think back to the days when we learned to do this, we should remember consciously working hard and 'applying ourselves' (as our parents used to say) to catching that ball. Over time, our conscious choices not only developed better musculature (through a quasi-Darwinian process itself; we bascially kill off the muscles

that aren't working right!), but set up the proper and
efficient chemical pathways along our brain, spinal cord
and extended nervous system, such that the line of
biochemical resistance for that sort of action was least.
After a while, we can habitually catch a ball; and some of
us are good enough to get paid to do it!

Personally, I don't like to use 'catching a ball' for this
illustration; I prefer to use swordfighting, because
(unlike ball-catching), there are plenty of highly
efficient behaviors in swordfighting that the body just
doesn't instinctively 'do'. They have to be trained into
existence by conscious effort.

And I don't like the terminology "unconsciously solves
equations". It's a potentially misleading hindsight
description of something we do differently in two different
modes. Math equations are our way of representing
relationships between properties in the real world. When
we're really learning to catch balls or swordfight (or when
we really _are_ catching balls or swordfighting), we don't
bother with representing these relationships: we're living
them, doing them, and often (though not always) reacting to
them. Math is a preparatory or hindsight means of
describing reality (including, as in this case, describing
what we are _actually_ doing.) It would even be misleading
to say that when we act and react, things happen that are
equivalent to solving equations. It's really the other way
around; when we solve equations, we are acting in a
specific fashion. Math (considered abstractly) is the
shadow or reflection of reality; or maybe a special kind of
contemplation. Math may be the only means we have of
accurately describing certain aspects of reality (like in
quantum physics.) But reality comes first. I realize this
introduces a sort of dichotomy in our experiences which
naturalistic philosophy, at bottom, doesn't distinguish
between. But doesn't this dichotomy account for more data
than a single unified system of existence? One can do
accounting until doomsday without generating a cent; 'real
money' must be fed into the system to get real results. The
question is whether this distinction is only an illusion,
or not; and it's a very thorny one. This is outside the
scope of this book, though; I only wished to make the
reader aware that there are some issues being casually
flung around here that aren't that casual.

This (possibly minor) complaint notwithstanding, Mr. Dawkins continues his fascinating and well-written track through animal space, discussing how geography and the environment help explain convergences and independent parallels (e.g., horses and South American litopterns.) One issue came to mind at the top of p 104, and since I don't remember if Mr. Dawkins has dealt with it, I'll add in something I've learned about it.

At this point, we're reading about horses and litopterns, and just previously Mr. Dawkins has explained why herbivores tended to evolve such that many (though not all) fast plains-runners have either one or two toes. It occurred to me that I didn't recall Mr. Dawkins explaining why it would be an evolutionary advantage to jettison a toe. But, aside from potential engineering advantages (running like horses or hopping like gazelles), there's another reason. Biomass (like a toe) takes a toll on a body. It's something that has to be replicated; that must grow, be replaced (like a toenail), or be nourished. That toll may be fairly small, but as Mr. Dawkins has pointed out earlier, a little advantage is better than none; and individuals who managed to survive long enough on previous modifications to get the new mutation spread significantly into the gene pool, provided a new population wherein a few less animals died or grew exhausted in critical times (predator evading, mating rituals) than before. This makes an impact, and gives the new species varient something like 'species inertia' in the positive sense (i.e., once it gets going, it's hard to stop. Hindsight note: we'll get back to a related, but somewhat different, meaning of 'species inertia' in Chapter 9.) Not only were newly forming single/double toes more useful, the extra toes were less useful. It became an advantage for random species varients to have smaller extra toes and, eventually, no extras.

We also get another small example, though, of how Mr. Dawkins wants to have his cake and eat it, too:

p 104, "Kangaroos and horses arrived at different endpoints in 'animal space', probably because of some accidental difference in their starting points."

Setting aside for the moment the (not inconsiderable!) problem that he's still only assuming lack of any Design, we get a statement that kangaroos and horses arrived at different characteristics by some kind of accidental

difference. This is from the same man who earlier was quite
vocal about animal designs _not_ appearing by accident (but
not by design, either.) His whole attempt at setting up
'complex' verses 'simple' entities in Nature requires this
distinction, and it plays into how he treats the concepts
of single-step vs. cumulative-step selection. This is an
example of how he could have avoided having people like
myself pick on his inconsistent assertions if he'd just
stuck with the concept that accident _and_ static
determination make up large hunks (a naturalist would
probably say 'all') of what happens in Nature. He himself
argues this occasionally (just to be equally inconsistent
on all points, perhaps!) But he had to divide up biological
entities from other entities in a way that (apparently) he
thought lent weight to his philosophical agenda; and so now
he must bounce back and forth between definitions of
'accident' to keep the agenda alive (e.g., God wasn't
responsible in any shape, form or fashion for what happened
with the kangaroos and horses--it was an _accident_.)

We get a far more serious inconsistency at the top of p
105, along the lines of the lobster example:

"To any dog-lover, the contemplation of this alternative
approach to the dog design [the now-extinct thylacine]...
this part-familiar yet part utterly alien other-worldy dog,
is a moving experience. Maybe they were pests to humans,
but humans were much bigger pests to them; now there are no
thylacines left and a considerable surplus of humans."

Not to sound heartless, but as long as we're sticking with
naturalistic philosophy... WHO CARES?! After spending 105
pages arguing that species naturally live and die and
evolve and go extinct due to environmental factors (like
the introduction of species with incompatible behaviors),
and with another 213 pages to go in this vein, on what
possible grounds does Mr. Dawkins expect us to care about
this? Affection for the thylacine? That's a personal
aesthetic preference of Mr. Dawkins himself, which under
his philosophy must ultimately be the pure result of his
heredity and upbringing, like the original (but perhaps
sunbleached) color of his hair. Besides which, it's obvious
that a ton more people were _not_ all that affectionate
about the thylacines; so if the mass has one opinion why
should we have another? (If it comes to it, I think the
living thylacine on film from the 1930s looks creepy,
myself!) Because we have a responsibility not to

exterminate species? I don't recall Mr. Dawkins associating anything like responsibility to cicadae when they swarm every 13 or 17 years, despite the massive damage they inflict on the lives of the creatures and plants in their path. Why are we being treated by the philosophical naturalist as if we were different or separate from the natural order of things? I might accept that he's merely recording his own personal preference, that has no link as such to anything remotely similar in objective experience-- except that he's also prepared _in advance_ (notably in his "nonprofessional life") to get worked up about boiling lobsters alive.

I'm not a monster. Actually, I _do_ care about the fate of the thylacine (_despite_ the fact that I think it's creepy looking!) I care about a lot of things, not all of which are thoroughly compatible with one another at all times. But if naturalism is true, there can be no real ethical imperative behind these feelings of mine, either pressing onto me or which I'm consciously evaluating and discerning. There are only environmental and social factors, themselves ultimately nonethical, which have conditioned me to feel this way. One such factor can only be the widespread acceptance of a certain concept among a race of people whose ideas eventually swept through what we call The Western World in what was (in terms of historio-sociology) a cataclysmic wave. That concept is codified (and has been for millenia) in the first two chapters of Genesis; and it claims a supernatural sanction from what amounts to a real Objective Ethical Standard (i.e., God.) I am not claiming that other religions and cultures haven't had similar standards--in fact, some have, and though historians and philosophers might differ on whether the stories behind these sanctions can properly be considered as reflecting 'supernatural' tenets, I think Mr. Dawkins would be pretty quick to lump them together in quality with Genesis. (Hindsight note: he does this explicitly in Chapter 11.) So those stories are also tossed away as real justification (though not as real unconscious influence) for his stance.

If he (or the sceptical reader) were to appeal to the concept that the stories, though not literal, reflected certain nevertheless objective qualities about how we 'ought' to behave, he'd suddenly be in agreement with a very large number of devout theists, pantheists, etc. And then the question would be: why a reflection of _that_ objective truth and not others? And the question of how

there could be a real, objective Ethical Standard without a real, objective and eternal Personality (or, more properly and significantly, an eternal trans-Personal Relationship) also raises its disturbing head.

These are deep issues; but mainly I want the reader to notice, for the moment, that Mr. Dawkins' views are not immediately consistent (and perhaps are ultimately _inconsistent_) with his own declared stances in his book. (Hindsight note: We'll be seeing more of this in future chapters.)

Mr. Dawkins concludes his fourth chapter with more convergency stories, notably anteaters and ant/termites themselves. We get another awe-inspiring look at Nature-- which, if naturalistic philosophy is true, tells us more about Mr. Dawkins than anything objective concerning the driver ants he watched. I also note that Mr. Dawkins doesn't extend his criticism of humans to the driver ants:

p 108, "Those gaping soldiers were prepared to die for their queen, not because they loved their mother, not because they had been drilled in the ideals of patriotism, but simply because their brains and jaws were built by genes stamped from the master die carried in the queen herself."

Now, the clear implication from this is that it is possible for a love-of-mother and an ideal of patriotism to actually exist above and beyond what can be accounted for by behaviors resultant from _our_ genetic stamps. I agree; but I agree because I'm a philosophical supernaturalist, and I acknowledge the discrepency (in fact an acknowledgement of a real discrepency is one of the reasons why I _am_ a philosophical supernaturalist.) If the discrepency didn't really exist, there'd be no point for Mr. Dawkins to contrast it. There'd also be no point to his implicit (but textually quite evident) critique of humans driving thylacines to extinction, or boiling lobsters, or acting "snobbish" about our own species. I don't see him critiquing the ants for being snobbish, though the end result of their actions is certainly quite similar. He does call them "ruthless" and "terrible" [p 107], but either this contradicts his own later estimation of the quality of their behavior, or else can be read in terms of 'no concern at all for morality (like rocks)' and 'I myself reacted with terror.'

The question is whether he can provide purely naturalistic
grounds for a real distinction between our behavior and the
ants' (particularly in the sense of what he implies we
ought or ought not to do), or whether he even intends to
try accounting for this distinction. If he explains these
feelings of distinction _away_ (which is not an entirely
self-contradictory task for naturalism), he will have to
admit there are no grounds for taking seriously his _own_
preferential opinons about what we _ought_ to do in our
relationships to the Nature which surrounds us. And _then_
he'll have to stick to it. Meanwhile, whether he realizes
it or not, he's continuing to leave suspicious looking
tracks on the carpet of his ideas--tracks which, in one
fashion or another, point back to supernaturalism.

NOTE: the following material is not a part of this chapter
yet, but I'd like to include something like it.

Here's an example of the difficulty of making a reasonable
estimate of probability for such things. Mr. Dawkins gives
the chance of a gene replication event producing an error
(thus changing the genetic structure to a mutant varient)
as being _less than_ 1 in a million (1/1000000). Even
that seems pretty generous to me, but I'll let it stand
because I certainly have no more accurate estimates to
offer--in fact, I'll even simplify it in his favor to 1 in
a million. He doesn't give a 'per' estimate for that
number, though. Is the chance of mutation 1-in-a-million
per individual per year? Per species population per year?
Per individual per lifetime? Per individual per event of
generation? This sort of thing makes a difference,
sometimes in his favor. Let's give him the benefit of the
doubt, and say that any individual of any species has a
millionth chance of producing a mutant strain of DNA once
every generative event. This makes the species population
at any given time a major factor in his favor. Further,
(particularly in sexual species vs. assexual), every
individual generative event may contain millions of sperm
or eggs (depending on gender/species characteristics), and
there may be multiple generative events per individual per

species per year--as many as an average of twice a day in
some cases (average human male potential, for instance.)

On the constraint side, individuals may very well die
before they can even take part in a generative event. This
is commonly observed in the fish and insect species, where
out of hundreds or thousands or millions of fertilized eggs
(per successful event), only a minute fraction of
individuals produced ever reach the age to engage in their
own generative events--without which, whatever new gene
sequence they may carry will never 'get off the ground', so
to speak. Out of this minute fraction, only another
fraction (sometimes itself minute) gets the chance to
actually engage in a generative event. Out of this
fraction, only another fraction (itself possibly minute,
depending on species/gender characteristics) of sperm or
egg in these lucky individuals are actually produced at the
right time in the right place. And out of this remainder,
only another fraction of particular seed elements may end
up being used. Out of _this_ remainder, only another
fraction (not particularly small, but a fraction
nonetheless) ends up producing the new batch of completed
gene sequences in the host gender. Out of _this_ fraction,
only another fraction of individuals (possibly minute)
survive long enough to get the fertilized batch into the
environment (lay the eggs, carry the child/children to
term). And, of course, only a fraction of these will live
long enough to 'start' a generative event themselves; and
the constraint process begins again.

Let's see how this plays out with humans. Human population
in general is a Plus to the probability, and the higher the
population the higher the plus. With more humans alive
today than at any other time in history, we've got the best
chances ever (in this category) to introduce mutant
variations into the human gene pool. Big Plus. But even in
today's world (and particularly in the vast majority of
human history), only a fraction of children who are born
live long enough to generate egg or sperm. This is a
definite Minus to probability, and historically speaking a
Big Minus. Human males produce lots of sperm per generative
event, and we have generative events on a regular basis--
Big Plus. Human females produce a relatively miniscule
number of eggs, though on a regular basis--still a Plus,
but almost negligible relative to the male contribution.
Any production of egg or sperm whatever, though, is a
generative event; and out of the fraction of humans who

live long enough to produce egg or sperm, only another
fraction live long enough to reach an age where the social
structure allows them to mate (this obviously varies from
culture to culture and from century to century within each
culture, but it's still a Minus. Humans aren't the only
species where social structures function as constraints for
successful mating, by the way.) Out of _this_ fraction of
the population, only another fraction actually gets the
chance to engage in a sexual act--any other sperm or eggs
generated are a complete waste as far as their ability to
affect the gene pool. Out of this fraction, only another
fraction of human sexual acts result in a baby. Out of
these babies, only an miniscule fraction were produced by a
mutant egg and/or sperm (particularly in the case of the
sperm, since any mutant sperm must compete with millions of
other 'normal' sperm to get to the egg). Only a fraction of
these babies (like any baby) live out to term, assuming the
mother stays healthy herself. But out of this fraction,
only another fraction of human women survive long enough to
give birth, and only another fraction survives the birthing
process itself with the baby intact. (Not so much minuses
now in our 'civilized' societies, but a not-inconsiderable
Minus in past societies and even in some current 'Third
World' ones.) And now we're back to the question of whether
the mutant baby itself survives long enough to propogate
itself--much less surivive long enough to propogate itself
more than once. (e.g., will a mutant male human live long
enough to successfully father more than one child?) And all
this assumes that the mutation is beneficent, or at
least doesn't _reduce_ the chances of getting through all
the next levels of constraints to spread itself out through
the gene pool!

This is the sort of 'probability complex' that is needed to
make a fair estimate of the probable number of generations
required, expressed as a function of time, or as raw
antecedent comparative probabilities (for comparative
purposes), or whatever. Excuse me; I mean that this is
needed to _begin_ making a fair estimate. For of course, as
the species change, the probability constraints also
change. The probability complex has to be recalculated with
each new species produced, and that requires for each of
these constraint details an estimated number which I'm sure
we don't know (because neither Mr. Dawkins nor any other
human could possibly know even a fifth of the necessary
data.) And remember that out of all these other fractions,
only a fraction of beneficient mutations result in actual

species-to-species change, as opposed to mere improvement
in the the species.

Is this all too complicated, do you think? Not if we're
really interested in getting a good number. But if you
like, let's grossly oversimplify the situation, very
probably in Mr. Dawkins' favor, and estimate the whole
thing from that one number: 1/1000000 chance of replication
error. Essentially, we'll now say that any given common
generation of any given species (expressed as a function of
time), irregardless of the other factors I just mentioned
(population, generative events per life of individual,
etc.) has a 1-in-a-million chance of producing a viable new
species from its gene pool; not necessarily even a drastic
change, just one that doesn't self-destruct in some
fashion. That's even better odds than a pure 1-in-a-million
chance of mere replication error producing change; and it's
easy to calculate probability from it. We can expect a new
species varient to emerge from any given species once every
million generations. We're not bothering with species-
specific constraints now (trying to keep it 'simple'), but
as you surely must know, different species have different
generation-cycles. (Cats are ready to produce new cats two
or three years after birth. Humans are safely ready to
produce new humans 15-17 years after birth.) Let's go
completely unrealistic and give the 1-in-a-million the best
possible feasible natural chance; average time between each
generation, _no matter the species_, we'll call one year.
We can now expect a new viable species (distinctive enough
that it can't interbreed with similar species) to emerge in
a 'species chain' about once every million years. Life has
apparently been on the planet for 4.5 billion years. A
billion is a thousand millions. There should be about 4500
species in the direct line between the original replicator
(virus or bacteria or whatever) and our own species.

Is this a reasonable number? I don't know. It sounds
plausible to me, to be honest. But then, I reached that
number using a highly unrealistic 'simple' estimate of how
often new species emerge in the 'family line', so to speak;
one that was not just unrealistic, but heavily favored on
the side of success. Note that if we change the average
time between generations to 3 years, we get a distinctively
different species in the chain between proto-species and us
once every 3 million years (on the average); which means
the expected average number of antecedent species between
us and the Original Replicator drops to 1500. Of course, in

simplifying the equation, I've left out a number of Plusses
and Big Plusses--but I also left out an even greater number
of Minuses and Bid Minuses. Also, in simplfying the
equation, I invariably took the most favorable options; so
it's hard (at least for me) to see how real Plusses in the
process could provide _more_ leeway than I've already
provided. Basically, from here on out, as we complicate the
calculation to make it more 'realistic', we'll be adding
negative constraints--and consequently, the number of
species between us and the Original Replicator will
steadily drop. I don't know how far, of course; this is
where we need real biological data about the constraints
for estimation purposes. But if we start getting answers
like 'less-than-150 species between us and the Original
Replicator', then suddenly evolutionary theory might not
look like a viable means of accounting _totally_ for our
emergence as a species.

Remember that Mr. Dawkins, on point 3 of p 78, cheerfully
suggested that all we had to do was imagine a number of
steps X such that wildly improbable changes wouldn't be
occurring at each step. He eventually suggested, with
perfect equanamity, that hundreds of millions of steps
could reasonably be necessary for human eyes to develop in
stages sufficiently small that each step was relatively
likely to occur. Once in a million _is_ extremely likely,
relatively speaking. Even under the super-simple/favorable
paradigm, we have only _4500_ steps to work with, _not_
100,000,000. The fact that he tosses the 100 million-step
option out with no qualification, as a solution to a
problem in the middle of an argument specifically dedicated
to the concept that something _did_ happen, indicates that,
at the very least, we're _both_ being rather ham-fisted
about probability estimates! The difference is that I'm not
trying to use probability estimates to convince people to
reject a highly influential philosophical position--
something which inevitably has serious consequences in a
person's life. Nothing I've written about probability in
this book argues against naturalistic evolutionism--except,
perhaps, that _if_ naturalistic evolutionism _really
requires_ the sort of probability arguments presented in
TBW, and _if_ I have shown that such probability arguments
are faulty at numerous points (or even highly
questionable), _then_ naturalistic evolutionism is in
trouble as a coherent system. But that's not the same as an
argument from me that it's false. It would, however,

require you (the reader) to decide how much (or even _if_)
you wanted to back a philosophy that isn't self-consistent.

The Smoke Gets Thicker;
aka, Chapter 5: The power and the archives

Chapter 5 begins with a very good description of willow
trees 'raining' DNA. Of course, Mr. Dawkins betrays a bit
of misunderstanding involving metaphor here; but English
teachers aren't always very good about instructing us on
the recognition of metaphor, and what metaphor entails, so
for purposes of illustration, let's check out what he says.

p 111, "It is raining instructions out there; it's raining
programs; it's raining tree-growing, fluff-spreading,
algorhithms. That is not a metaphor, it is the plain truth.
It couldn't be any plainer if it were raining floppy
discs."

Now, I agree with him (insofar as what the trees are
doing); but he's still using metaphor. 'Raining'
instructions and programs is as much a metaphor as saying
that my brother's dog is 'raining' on the floor. Both are
giving us useful, and colorful, bits of true information;
but neither of us mean that the tree or the dog is floating
in the sky condensing water (or information) and dropping
it. Mr. Dawkins chose 'raining' because it's a good image,
and gets the point across admirably; just like when he says
earlier in the paragraph that his binoculars "can reach".
It _is_ the truth; it's _also_ a metaphor. We can't jump
off our own shadow, it's the way we talk. We can make our
language drier; we can't make it more literal.

I've pointed this out before, and I'm taking the
opportunity to do it again, because it has a bearing on how
people perceive religion (particularly Christianity.)
Metaphor is not a vague, wishy-washy, deceptive, or purely
poetic way of communicating concepts or information.
Metaphor itself is a shorthand way of conveniently
describing 'what is' or 'what happened', but by default
that doesn't short-circuit the actual reality. The only
danger is lest we confuse the metaphorical expression
itself with the reality; or lest we claim _as_ metaphor an
expression that _isn't_ (or vice versa.) Sometimes this can
be tricky, because often what makes metaphor 'metaphorical'
are the connotations of the words in the mind of the hearer
or reader. For instance, calling the genetic code
"programs" or "algorhithms" is not, I think, by itself a
metaphor; just different words describing the same concept.
But if we add the connotations which we usually _associate

with_ programs or algorhythms (circuits, magnetic
potentialities, languages, _designers_!) then the terms can
become metaphorical; perhaps no less useful for conveying
the core information, but more likely to carry that
parallel over to connotations unintended by the speaker.
For instance, the very word "instructions" itself implies a
necessary Instructor. _I_ might agree that such a term is
"not a metaphor, it is the plain truth"; but I seriously
doubt that Mr. Dawkins would agree, if he took the time to
think it out!

p 111, "A few years ago, if you had asked almost any
biologist what was special about living things as opposed
to nonliving things, he would have told you about a special
substance called protoplasm."

"A few years" being about 100 years ago. Not very long in
the history of humanity, much less of life, much less of
the universe itself; yet a lot has happened since then.
Even the "elderly textbook authors" of Mr. Dawkins'
childhood were quite out of date, as he himself admits. I
should point out that the protoplasm adherents were just as
likely to be non-Christians as biologists today (or perhaps
even moreso) thanks to the then-recent Enlightenment. Just
in case anyone was thinking about drawing a necessary
topical link between creationistic theists and faulty
scientific theories.

p 112, "What lies at the heart of every living thing is not
a fire, not warm breath, not a 'spark of life'. It is
information, words, instructions. If you want a metaphor,
don't think of fires and sparks and breath. Think, instead,
of a billion discrete, digital characters carved in tablets
of crystal."

Well, aside from the fact that it would be Mr. Dawkins, not
I, who ultimately rejects the idea of "instructions" being
literal; I would say that the 'spark of life', 'fire' and
'warm breath' crowd turned out to be right after all (just
not inclusive of details they couldn't have known about.)
Molecular gases (most notably hydrogen, oxygen and
nitrogen) are still necessary at the molecular level ('warm
breath'); the chemical reactions for forming the molecules
require heat energy for composition (i.e., endothermic
reactions--they give off heat, too, when they split, which
is exothermic--the 'breath' must be 'warm'); and electrical
potentialities hold everything together from the sub-

molecular level onwards, as well as facilitating
transmission of certain necessary energies, most notably in
our nerves ('spark of life'). The "characters carved in
tablets of crystal" _themselves_ depend on these things,
however we choose to describe them.

This is a situation where Mr. Dawkins, instead of working
with ancient thinkers and giving them credit where credit
is due (perhaps correcting and amplifying the connotations
of their imagery), prefers to snub them. I suppose he can,
if he wants to; he can always reintroduce those concepts
divorced from the striking ancient imagery that preceeded
them. But, since a good deal of his 'argument' involves
making the ancients look like idiots, I think I'm justified
in calling for a little fair play, here.

His discussion of digital vs. analog information is
somewhat misleading, too, and illustrates his general
tendency to dichotomize unnecessarily (though this is a
less important instance, to be sure.) Some readers may wish
to skip the next four paragraphs, but for those who, like
myself, enjoy the esoteric:

The following sentences would be quite accurate, had he
attached one word and one small suffix: "The basic
requirement for an advanced information technology is some
kind of storage medium with a large number of memory
locations. Each location must be capable of being in one of
a discrete number of states."

Frankly, this describes analog _as well as_ digital
technology. The basic requirement for a _more_ advanced
information technology is a storage medium with a _larger_
number of memory locations--larger compared to the current
status quo. But as far as being in "one of a discrete
number of states", this applies to analog as well. Heck,
even an ancient abacus works because one can put it in one
of a discrete number of states. The "wavy groove" of the
old record album is not smooth, but has a (very large)
number of ridges in the groove. The groove holds the
needle. The ridges 'twang' or 'pick' on the needle (that's
why the needle works; you can run it across your
fingerprint, too, for a really weird sound.) Each of those
ridges is in a discrete state which results in a different
sort of twang on the needle than another state. Magnetic
tape (which, as a former broadcaster, I can assure you is
considered 'analog') contains an even larger number of what

amounts to 'rust particles' (seriously!) which end up being
aligned in discrete states by electromagnetic
potentialities. This same technology is still in use today
on most floppy discs and hard drives; electromagnetic
manipulation is very easy to 'write' and 'erase'. The
'read/write heads' have gotten smaller, and more precise
alignments are always being made possible; theoretically, I
suppose it might eventually go down to the monomolecular
level. Unlike tape players, hard drives (and floppies)
reduce the number of discrete states to two: on/off. This
is, at bottom, the only series of states that a computer
'understands'. But, we're pretty clever at wiring the
things so that from the proper combination of reactions to
on/off states, the computer can help you type a paper (like
the book you're currently reading), or allow you to run
through miles of a wrecked scientific outpost, trying to
dodge extra-dimensional aliens and hostile military
personel (i.e., Sierra's _Half-Life_.)

The problem is that 'digital' as a word has been slurred in
its meaning. As long as we're just talking binary discrete
states, there are plenty of analog devices that are
'digital'. But 'digital' as _opposed_ to 'analog' mainly
means 'the data isn't transmitted by one substance scraping
across another substance.' Laserdisc players function by
shooting a narrow beam of one-color light and noting the
scatter (or lack thereof) from relective surfaces. The
discreet unit of surface can either 'reflect' or 'not
reflect'; and it can be really, really small. Since nothing
physical scrapes across the laserdisc (unless one wants to
get _really_ technical; light has a certain amount of mass
and lasers definitely transfer a certain amount of kinetic
energy), it isn't "analog". It's "digital", insofar as
vinyl records (against which they were compared when they
were first released) create their sounds by surfaces
rubbing on surfaces; and perhaps also because the vinyl
records have multiple discreet states, not binary states--
not because vinyl _lacks_ discreet states for every section
of the groove.

Also, while I'm at it, I disagree with Mr. Dawkins'
estimation that the phrase 'compact disc' is uninformative
and mispronounced (by accenting the first syllable.) The
name is uninformative _now_, because few people remember
the original laserdiscs (still in service, by the way)
which are the size of vinyl albums. By comparison, the next
generation of discs were 'compact'. Also, philologists

might differ as to whether 'compact' is actually being mispronounced with a first syllable accent if used as an _adjective_ vs. as a _verb_ (compare "compact car", which preceeded "compact disc" as an English term, versus "trash compactor"); but I think they would agree that once it is placed at the beginning of a three-syllable phrase with those types of consonant structures, an English-speaking person would be bound to accent the first syllable, and thus it would not be mispronounced. Frankly, as long as we're discussing a living language like English, it's difficult to argue for anything other than a subjective opinion about pronouncement. That's why the Boston Celtics are the Boston Sell-tics, rather than the Boston Kell-tics (which happens to be the proper way to prounce Celt and its derivatives--when we're talking in terms of historical entities. The Gaelic language isn't quite dead yet, so if anyone gets to determine whether 'celt' _should_ be pronounced differently, it would probably be the Celts themselves!)

Well, that made a nice change of subject; back to the topics at hand...

On p 113, Mr. Dawkins actually positively references a religious fellow who helped lay the groundwork for biological evolutionary theory: Gregor Mendel, who pioneered the idea that "we don't blend our inheritance from our parents. We receive our inheritance in discrete particles." The reader, of course, wouldn't likely have known this man was a creationistic theist had Mr. Dawkins not noted as an aside that Mendel was "tucked away in his monastery... unfortunately ignored until after his death".

Mr. Dawkins presents a good argument on pp 113-114 concerning how simple examination of data confirms that inherited blending doesn't take place (at least not in the way pre-Darwinians and early anti-Darwinians envisioned it.) But, he does show again that he prefers to play both sides of the philosophical fence:

p 114, "Don't be distracted by the racist assumptions of white superiority [in the preceeding excerpt]. These were as unquestioned in the time of Jenkins and Darwin as our speciesist assumptions of _human rights_, _human_ dignity, and the sacredness of _human_ life are unquestioned today." [italics his]

Now, Mr. Dawkins clearly shows by the term "speciesist"
(and by the contextual and emphasized use of 'human rights'
etc., compared topically with the "unquestioned" racist
assumptions) that he thinks these assumptions are
ultimately irrational--they are caused purely by us being
the species we are, with the consequence that they provide
no grounds for conclusions about objective reality (even
if, perhaps, accidentally true). This has some serious
consequences for his own argument in numerous places, not
least of which is whether we should consider the argument
in _his_ book as the total product of similar
environmental/hereditary influences. (If so, by his own
application of the concept we shouldn't "be distracted" by
his argument, even if accidentally true!)

But there are other problems as well. Mr. Dawkins is upset
that Australian ranchers genocidally slaughtered the
thalycides, and is quite prepared to get worked up (in his
"nonprofessional life") about boiling lobsters alive. He
apparently believes, then, in some sort of human
responsibility; but, from where did he get that notion?
Obviously not from a speciesist assumption of the sort he
uses to dismiss the concept of 'human' rights; apparently
not completely from the environment and heredity (that was
where the speciesist assumption came from, too, so why
would the 'responsibility' be valid on that score?) It
apparently is a particularly _human_ responsibility,
because he has shown no inclination to attribute it to,
say, driver ants or any of the numerous other animals he's
mentioned thus far; so he's not deriving it from a general
conclusion about animal behavior.

Is there any real question _where_ he got it from? He got
it from the same place I did; the general (if not strictly
universal) human tradition, and in our case as Civilized
Western Men probably from the particular human traditions
stretching back at least as far as the composition of
Genesis. But I didn't find the concept of 'human
responsibility to the environment' there by itself; I also
found with it human responsibilities to other humans--with
concurrent concepts of inalienable human rights, dignity,
and sacredness of human life. I even find there a fairly
clear conception of sacredness of _animal_ life; something
not restricted to the Old Testament, but certainly not
foreign to it, either.

I would agree that any one, or a limited selection, of
these precepts (among many others) should _not_ be erected
into an 'ultimate principle' to be followed at all costs
and to which all other principles must always be subject.
But on what grounds does Mr. Dawkins expect me to accept a
reduction of these principles (themselves not entirely
traceable to pure non-sentient, blind, automatic,
environmental reactions, if we mean to take them
seriously)? Why toss one kind and not another?

The answer, I think, is actually pretty obvious, though not
valid as grounds for selective dismissal. Mr. Dawkins has
selected as "speciesist assumptions" those elements of the
general human tradition which just happen to most
immediately coincide with the general claims of the most
prevalent creationistic theisms (Judaism, Chrisitianity,
and Islam); which all tend to focus on God acting in
history for the sake of Man. By the formal relationship of
narrative convention, if nothing else, this can't help but
focus attention on those aspects of the general human
tradition. Once we grant that Mr. Dawkins rejects
creationistic theisms (on grounds which, by the beginning
of Chapter 5, we _still_ haven't gotten to!) he could, with
a certain sort of logic, disparage what we might call the
'residual perception effect' of believing in those theisms.

But he plays quite a dangerous game. Discussing the
philosohpical and sociological issues involved about
societies that don't recognize such rights (and what this
at bottom really implies) would be too complex even for me
to try summarizing in this book! Let's take a look at a
more immediate example of what his position implies.

It is incontestable that different 'races' of humans have
regularly and predictably different physical structures.
This is not emotionalistic racism; it's how coroners help
find out the identity of murder victims (and the identity
of the killers), and how archaeologists and anthropologists
trace the spread of Man (and the consequent historical
factors involved) over periods of time. It's why African-
Americans can suffer from sickle-cell anemia. The fact of
the matter is that different 'races' (for want of a better
word) _do_ possess regularly occurring physical
characteristics which differentiate them from other human
'races'. This process is not stable; it's constantly in
flux due to environmental factors and interbreeding, but by
and large populations tend to maintain these similarities,

at least within the short span of time which we regard as a culture's 'history.'

The natural (quite literally _natural_) consequence to this is that some races will be superior to other races, on the average, in certain areas due to physical efficiencies that other races lack. I know it's hard to say this in today's societies without calling down a firestorm of social criticism, but I'm asking the reader to please set aside prejudices of _any_ sort for a moment and look at the objective facts. It cannot help _but_ follow that if (for instance) bone-structure and ligamenture tend to be longer and stronger in a particular 'race', then generally speaking and other things being equal, members of that 'race' will be better runners and jumpers. There are more than sociological reasons why most of the best basketball players are black.

Now, here's the problem: within naturalistic philosophy of the sort Mr. Dawkins is advocating (and not yet even producing arguments _for_), THERE IS NOTHING EXCEPT THE PHYSICAL! That means that far from allowing us to dispose of "racist assumptions of white superiority" (or allowing us to dispose of assumptions of Japanese superiority or Korean superiority or Persian superiority or Zulu superiority--they had assumptions of that sort, too), there is nothing in naturalistic philosophy to stop it! It is a logical consequence of a purely physical non-violable interlocked system, that behavior and ability (mental and otherwise) depend completely and absolutely upon physical properties in our bodies (the brain being part of the body and nothing more.) It is entirely obvious that physical differences allowing better efficiency under certain conditions differentiate 'races' of humans; it follows from naturalistic philosophy that there is no reason why there cannot be (and aren't) similar physical differences in the brain which might make one 'race' more efficient than another (e.g., Orientals and Jews at math.) And physical efficiency itself (which includes everything we'd otherwise call 'mental') becomes the only yardstick by which a 'race' 'deserves' to live, die, serve, etc.

"That's not true!" the skeptical reader may shout. "No race deserves to serve another based on relative efficiency of physical attributes!" I agree: in fact, if naturalistic philosophy is followed through with, no 'race' _deserves_ anything at all (and neither do individuals.) That also

means no individuals _deserves_ to be treated with dignity, sacredness of life, or any of those other "unquestioned speciest assumptions" Mr. Dawkins brought up. Claims to the contrary either apply to ultimately supernatural precepts, or apply to a natural precept which turns out to be ultimately amoral (and thus leads us back out again away from the concept of deservedness.) Nevertheless, biological evolution is about physical efficiency, especially with regard to replication, and that means in a social setting (assuming nothing but the physical) the inefficient will naturally be usurped by the efficient. And there will be no recourse; no 'blame' can be really be logically/ethically assigned. The efficient are replicating; and because they're efficient, they replicate more efficiently.

"But that's not how Nature works!" the skeptic may continue. "Animals and plants don't force other animals and plants into servitude or extinction!" Untrue on all sorts of counts. New, more efficient species will naturally smother the old, less efficient species, if resources are limited. If not, it's only because resources aren't that limited; not because the species 'shouldn't' do that sort of thing to one another. And some animals do exploit others. Some ant species farm aphids; cuckoos get other birds to raise their young (which usually requires tossing the original bird's egg.) When you get down to it, all life exploits other life, usually to the detriment of the individual. Cheetahs eat gazelles, wasps eat caterpillars while they're still alive, birds eat strawberries. Typically, this results in more efficiency for the herd in general--the tastiest strawberry seeds get spread over a wide area when they're expelled from the birds; the gazelle herd keeps its strongest, healthiest members and disease is culled. Where is the problem? Only with us humans as conscious individuals, apparently.

Besides, humans are _also_ not doing anything 'wrong' by forcing other humans into servitude or extinction, according to philosophical naturalism (if the precepts are actually followed through with, and not just ignored when things get annoying, like now!) The various 'races' are just doing what they do--which happens to result in 'servitude' or extinction for other races or species. As Mr. Dawkins himself notes on p 126, "[A] central truth about life on Earth... is that living organisms exist for the benefit of DNA rather than the other way around."

Let the reader ask herself on what _grounds_ Mr. Dawkins
wishes us to ignore the "racist assumptions of white
supremecy" presented in his quoted parable. I know what
grounds _I_ would use. I would refer to the (ultimately
supernatural) assumptions which lie behind such documents
as the United States Constitution and Declaration of
Independence, which recourse to God-given 'inalienable
rights'. I would refer to the sanctions (presented as
divine) in practically every civilized religion (and many
'savage' ones), including my own, about the various duties
we have to people. I would refer to philosophical argument
based on observation of our behaviors, to the effect that
morality must be objective (and, by further analysis and
conclusion, Personal), and thus universally binding--if
only we can discover or decode it, and apply it to our
present circumstances. Then I would look at past and
present attempts to discover and decode it, and try to
judge which are the most cogent and internally consistent.

Meanwhile, what physical grounds (since the physical is all
that exists), would Mr. Dawkins suggest for ignoring those
racist assumptions? Various instincts codified through
environment and heredity are the only things I can think of
that would fit the 'completely physical' qualification.
What use is an exhortation to us, then? If the instincts
are working, they'll work with or without his exhortation.
(And what grounds do we have for not considering his
exhortation _itself_ an instinctive reaction?) If not? Then
it's probably more efficient for our instincts to _not_
ignore the racist assumptions; exhortation to our morality
or reason will be useless (we'll be instinctively ignoring
them); and we can't be blamed for not ignoring the racist
assumptions.

I do not claim that a naturalist's position on _this_
matter is flatly self-contradictive. He can brazen it out--
for a while. But I think he can only keep doing so, if he
selectively ignores the implications of his philosophy when
they start to impinge on him; or if he selectively ignores
the implications of his actual behavior and ability to
choose, because they impinge on the philosophy.

Having shot himself philosophically in the foot again, Mr.
Dawkins proceeds through pp 114-115 with the beginnings of
the discussion about genetic information storage. I think
his concept of digital vs. analog doesn't quite hold up to
the claims he made for it on the first page of this

chapter, but it doesn't strictly matter. The point is that
genetic code is written in a four-state system; four
discreet (though themselves terribly complicated)
chemicals, abbreviated here as A,T,C, and G. (These are the
first letters of the chemical names; e.g., C=Cytosine.)
Continuing through p 116, we get another idea of the
information-carrying capacity of our own genetic code, as
well as of other codes. Mr. Dawkins makes something of a
good point regarding the ameobas being unjustly called
'primitive'; strictly speaking, they've had far more
generations on the planet than we have. Of course, as he
also notes, only 1% of our genetic code appears to be
active in running and developing our bodies; and we don't
know (or at least we haven't been told) whether the amoeba
even uses 1% (the fact it certainly has more raw potential
for 'data storage' doesn't count, by itself, because we
apparently don't use the overwhelming majority of the
genetic code _we_ have.) Also, I have to wonder whether Mr.
Dawkins would agree that "backwoods" creationistic theists
are _also_ not 'primitive', even though a modern
naturalistic scientist (like, for instance, himself) can
apparently relate better to reality than they can. Somehow,
I doubt he'd be willing to extend them that sort of credit;
maybe it's not "unjust" to call amoebas 'primitive' after
all.

The use of the New Testament in illustrating how much data
can be put into a bacterium, and the speed of its
replication--with respect to its smallness--is very funny.
I especially liked his clever rephrase of the old
metaphysical question "How many angels can dance on the
head of a pin?" It's a bit of a cheap shot within the
context of the rest of his book, of course.

The description of RAM and ROM on pp 116-117 is good. For
those who didn't know, RAM stands for Random Access Memory;
and he's right, the title is misleading!

More good data up through p 119 (I would consider sections
like this recommended textbook reading), though a bit of
clarity may be in order here.

p 119, "The nonrandom survival and reproductive success of
individuals within the species effectively 'writes'
improved instructions for survival into the collective
genetic memory of the species as the generations go by."

The thing to remember about this is that the instructions
changed (naturalistically speaking) due to the "occasional
random errors in copying" he mentioned just previously.
Obviously, if the instructions didn't improve, then in the
long run they probably won't (but still might) get passed
on by efficient replication (what used to be called
'survival of the fittest'.) This is made more explicit at
the bottom of p 122.

Something to keep an eye on for future reference, top of p
120:

"In the same way, patterns in the DNA four-letter code have
effects, for instance on eye colour or **behavior**, but
these effects are not inherent in the DNA data patterns
themselves. They have their effects only as a result of the
way the rest of the embryo develops."

Now, I'm far from denying that DNA sequences form a basic
template for our behaviors (this is what used to be called
'temperament'; possibly a term still in use.) The question
is whether it _completely_ accounts for _all_ behavior;
essentially, did Mr. Dawkins' book appear because of a
combination of the reaction between the results of the
interactions of his genetic codes, and all other physical
(nonrational) environmental factors, of which other
chemicals (like in his teachers' genetic codes) had a part?
That would make his book, at bottom, not qualitatively
different from Mont Blanc--it would just 'be', not 'be
about' something.

p 123, "DNA's performance as an archival medium is
spectacular. In its capacity to preserve a message it far
outdoes tablets of stone."

I guess three pages were a little too long for him to go,
without taking a poke at the opposition; an unnecessary
poke, too, since he could have said "far outdoes compact
discs" and not only been truthful but more impressive. But,
no, he had to take a little dig at a tradition which has
nothing to do with anything he's discussing at this point;
just for spite's sake, apparently.

Oh, wait, I see now; woven into this illustration of how
efficient gene sequence copying can be, is a tacit stab at
textual corruption in Scripture. He's quite right when he
says, "This whole comparison has been a bit of a cheat..."

[p 124], at least in terms of rigging up a false impression regarding textual transmission. But let the reader remember two things:

a.) The number of Scriptural recopies is a very small number occurring over a very small period of time, compared to his example--especially when you take into account the point that it traditionally happened once every 80 years.

b.) More importantly, they didn't just mindlessly copy the texts. Like the proofreaders whom Mr. Dawkins introduces on p 126, they referenced back multiple times to earlier copies, they crosschecked one another for accuracy, and they studied the texts constantly between rewrites so that they (and the cross-checkers) were familiar with the contexts and internal consistencies of the material. They also had (which very few scholars dare deny these days) a very serious sociological motivation to keep it all straight due to the view they had of God, His relationship to history, and their place in the story. This extended even to situations where they _knew_ (or suspected) an error had crept in; they were hesitant even to correct the error, which is one of (several) reasons why a mountain of ancient commentary on the Scriptures was concurrently developing. This commentary also shows that they weren't liable to backwards confabulation on points of doctrine; they didn't change the Scripture if they had a problem, they editorilized on it with a different document! (And their scholars were, and still are, required to be familiar with the editorializations, e.g. the Talmud.) New Testament Scriptures worked very much the same way, with at least as strong an oral tradition behind it. Essentially, tacitly comparing the transmission process to the 'Grandmother's Whisper' paradigm (even a technically more efficient one like Mr. Dawkins' example), is fallacious. (Mr. Dawkins admits to being unfair to the typists later; but we don't hear anything about Scripture at _that_ point.)

The NT is universally recognized as the best attested-to set of documents in the ancient world (even sceptical scholars don't bother arguing against this; they argue that the original material was fabricated or misunderstood), and the methods of preserving and analyzing Scripture formed the basis for the science of textual criticism. These principles have been in official use for about a hundred years, not because they're 'conservative' or 'evangelical' or 'fundamentalistic' (in fact they're none of these

things), but because they're scientific, they're neutral,
and they work no matter the material. The reader may
satisfy herself with this process by going to a university
library and checking out a recent copy of the _Handbook of
Textual Criticism_. (This and similar textbooks tend to
take the New Testament as their example, because it's the
most famous ancient document and provides the most material
variety to work with.)

The result is that copies of the New and Old Testaments
from the Greek and Hebrew (the _New American Standard
Version_ is perhaps the closest in English, and I'm sure
there are Jewish equivalents for the OT) have survived
99.5% unchanged since the time of the NT's composition. And
thanks to the Dead Sea Scrolls, we can be confident that
the OT is in virtually the same good condition dating back
a few centuries earlier than that. The vast majority of the
errors that we _do_ find (and thanks to the unrivaled
multiplicity of copies, it's easy to find them and date
them), are spelling and numerical errors, with
inconsequential sequence variances being second-rank (e.g.,
in 1st Century common Greek it doesn't matter whether the
word order is Dog bites Man or Man bites Dog, though it
would matter to our grammar.) Practically all of the
consequential variations can be found in specially edited
versions of the Bible, like the NASV; and yes, these Bibles
are also used in the "backwoods" churches.

I recommend the following books which help demonstrate the
strong internal consistencies and generally historically
reliable nature of the Scriptures (especially the New
Testament):

Gregory Boyd's _Cynic Sage or Son of God_ and Craig
Blomberg's _Historical Reliability of the Gospels_ are two
recent, technical, heavily footnoted works deeply rooted in
proper historical procedure and textual criticism. They're
also less evangelistic than some other writers. Boyd is
especially good, as he goes to great lengths to give due
credit to the opposition where possible, and provides
plenty of source references for sceptics to backcheck from
their own side. John Haley's _Alleged Discrepencies of the
Bible_ is a work dating from the 50s which is also based
primarily on textual analysis, though he's a bit more
'evangelical' in tone. (The reader will probably also wish
to ignore part 2 of Chpt 2, which uses a variety of the AfD
for a secondary point--but the work does not stand on this

and is in no way inconvenienced by its removal.) Almost any
book by Bruce Metzger will be worth reading, regarding the
particulars of textual criticism.

p 127, "The essential difference [of DNA] from dewdrops is
that new dewdrops are not begotten by old dewdrops."

What begets the new dewdrops? Apparently DNA, if I'm
reading the context of the surrounding paragraph correctly.
What begets the new DNA? In the case of asexual production
I suppose the answer would in fact be 'other DNA', and the
entire dewdrop functions mainly to spread the new copies of
DNA (or prepare for the spreading.) Even then, the DNA
needs that dewdrop; so I'm not sure what's gained by
cutting the middleman out. (It's like asking where chickens
come from, eggs or other chickens? Any answer that claims
one instead of both as a composite unit tends to ignore a
great deal of reality.) But in the case of sexual
reproduction (I don't know whether dewdrops reproduce this
way, so let me change the example to, say, cats), would it
really be true to say that the kittens are not begotten by
the cats? There, the function of the composite creature is
even more necessary for the spreading of the DNA through
genetic space. And even in the case of DNA itself, its
medium contributes significantly to its ability to
replicate in any fashion; remove the fluid it floats in,
and there will be trouble. I suppose it depends on how the
sentence is read; I'm not entirely sure this is a mistake,
but it seems like there's something about it that doesn't
add up. A little more detail or clarity here would have
helped me get the point better.

pp 127-128, "Fundamentally... the properties of DNA that we
have identified turn out to be the basic ingredients
necessary for **any** process of cumulative selection."
[italics mine]

Refer back to my extensive caveats regarding this proposal,
taken as written here. I would probably have no problem
admitting a variation of this sentence: "the basic
ingredients necessary for any process of _biological_
cumulative selection."

p 128, The use of the story of Ezekiel in the valley of
bones to illustrate primordial biological (or pre-
biological) processes leading to self-replicating

compounds, is a clever one. Meanwhile, he begs the question again:

"This is the basic ingredient of cumulative selection. There must somehow, as a consequence of the ordinary laws of physics, come into being _self-copying_ entities or, as I shall call them, _replicators_." [italics his]

I hope that by now, the reader will have noted that he's assumed his conclusions again. What is one of the necessary premises in his argument that science reveals a universe without design? That there **must not** be a designer. Well, duh. Would it not be shocking if, assuming _that_ to begin with, he _didn't_ arrive at that conclusion? (Well, actually, even with that rigging of the system, he still doesn't arrive there... I've argued already that he keeps looping back to issues which show that there _is_ a Designer!)

p 129, "And at least some of the replicators should exert _power_ over their own future. This last ingredient sounds more sinister than it actually is. All it means is that some properties of the replicators should have an influence over their probability of being replicated." [italics his]

So, if that sentence sounds "sinister", why include it? Why not stick with the explanatory sentence, which also has the (more realistic) advantage of not letting in misleading mental imagery regarding whether the replicators are acting or reacting? Answer: _because_ the first sentence lets in misleading mental imagery regarding whether the replicators are acting or reacting! It's like a prosecutor who tosses out an objectionable sentence, retracts it, and then rephrases to something different. He _knows_ that first sentence isn't just going to be erased in the minds of the jury. Keep in mind, reader: the replicators do _not_, in fact, "exert power" over their own future! Their chemical properties just happen to be such that the probability of successful replication is higher, relative to their current environment.

Otherwise, his example of the basic process through pp 130-131 is good. He notes that an 'error' in copying need not be pejorative; it might be an improvement (it's just an 'error' in terms of the natural tendency of the chemicals to serve as accurate molds for the formation of similar chemicals.)

p 130, "Insofar as I can claim to have had any original
scientific ideas, these have sometimes been
misunderstandings, or misreadings, of other peoples'
ideas."

This quote was too funny, in context of his methodologies,
to pass up.

The description of where viruses fit in at this step is
also good, but remember that when he says:

p 131, "But if you read the small print of the viral RNA
you will find something devilish."

He only means 'particularly efficient and not what was
happening in the target bacterium.' The Ebola virus is
similarly efficient at working on our blood. It doesn't
really violate human dignity, or the sacredness of human
life, or anything like that--according to naturalistic
philosophy. I'm not being funny; these are the results of
playing by philosophical evolutionism's rules. It may
feel to you, the reader, like the virus is doing that, or
like the virus is behaving in a sinister manner; but that
is _only_ a conditioned response to the situation, and
doesn't pertain to anything in objective reality which
corresponds to your feelings in the way it seems to you it
does. Consistent atheism makes demands on a person. Mr.
Dawkins himself doesn't play by the rules consistently (or,
more properly, he doesn't admit he occasionally breaks
them--which in itself would be a very strange admission not
in keeping with naturalism); but perhaps the reader will do
better. (Note: I'm not claiming that Mr. Dawkins is
attributing the motives of devils, or motives like devils,
or _any_ motives at all to the RNA. I'm claiming that Mr.
Dawkins is giving an unnecessarily emotive term to the
process, which is clouding the central issues he's supposed
to be presenting.)

Up through p 134 we get more good information, including
the results of the Eigen group in growing RNA from
replicase and RNA building blocks. Mr. Dawkins notes that
this process is automatic, and non-deliberate; that the
'machines' don't 'know' why they make RNA molecules, and
that intent is not a factor. Intent can apparently be a
factor for _him_, though: "If I knew how to make copies of
myself, I'm not sure that I would give the project high

priority in competition with all the other things I want to
do: why should I?" Mr. Dawkins recognizes that intent is
really possible for him, because he explicitly states that
in this particular case he would have no intent to copy
himself. But that's apparently because he's a human and not
RNA. Where did his ability to 'intend' come from? I guess
we'll see. It should be clear to the reader, though, that
it isn't coming from the early stages of the process. Near
the start of the book, when I was discussing where the
difference between levels of "work" develops (intent
compared to description of event), I had gotten back to
sub-chromosomal compounds like cytosine. Work at that stage
is still physics work; and apparently Mr. Dawkins thinks it
stays that way up through RNA/DNA replication. (I agree.)
Let's keep an eye out and see where the switch comes in.

You might excusably think, reading the middle of p 134,
that the switch is _never_ supposed to come in. (In fact,
in rigorous naturalism--when naturalists follow the
implications of their assertions--it never _is_ supposed to
come in!) Read for yourself:

p 134, "But properties like 'stickiness' are rather boring.
They are elementary properties of the replicator itself,
properties that have a direct effect on its probablity of
being replicated. What if the replicator has some effect
upon something else, which affects something else, which
affects something else, which... [ellipse his] eventually,
indirectly affects the replicator's chance of being
replicated? **You can see that, if long chains of causes
like this existed, the fundamental truism would still
hold.** [italics mine] Replicators that happen to have what
it takes to get replicated would come to predominate in the
world, _no matter how long and indirect_ the chain of
causal links by which they influence their probability of
being replicated. [italics his] And, by the same token, the
world will come to be filled with the links in this causal
chain. We shall see those links, and marvel at them."

Several things to notice about this:

a.) I guess I'll have to apply to the AfPI: I can't for the
life of me see why these links are _really_ 'indirect'.
Interlinked chains of cause and effect don't work that way;
the only 'indirectness' of the process would be that there
are now X steps instead of 1 step. Mr. Dawkins himself at
the top of p 135, says, "It doesn't matter how many links

there are in the chain from cause to effect," yet still
seems to be calling the consequences "indirect." I think we
must conclude, especially from p 135, "be it ever so
distant and indirect" and "the indirect, indeed far-
removed, consequence of a change in the DNA text", that Mr.
Dawkins only means by "indirect" that there are numerous,
but directly traceable (in theory), steps in the process.

The problem I have with this, is that something which _is_
directly traceable is _not_ really "indirect". This is not
itself a major problem; but it could function as a
smokescreen for intent later. That's because there's
another meaning of the word 'indirect' which has links to
intention.

For example, I'm driving my car down the road and I hit a
puddle. The puddle is splashed by my tires, and lands on
Mr. Dawkins' pants. He reflexively jumps back, away from
the curb, and jostles a bystander. This bystander happens
to have a bit of plaque in his cartoid artery jarred loose
by the impact. The plaque shoots up to the brain, where it
lodges and causes a backpressure rupture of nearby
capillaries and arteries. The bystander has a stroke, and
because of where this particular stroke occurs, he dies
before anyone can help him.

Now, let us see in what sense it is accurate to say that
this stroke was an indirect consequence of my hitting that
puddle with my car. There are a large number of steps, but
the flow of reaction is quite traceable--directly
traceable, in fact. However thin I slice this interlocked
sequence of events, the mere fact that these events _are_
interlocked means that in principle the effects are
directly traceable from the cause (whether or not anyone
ever bothers to try and/or succeeds in it.)

On the other hand, we could say (without gross abuse of
language) that the stroke was an indirect consequence based
on the goals of my _intention_. But this only makes sense
if the intention of my will (in this case to drive the car)
is in some fashion an initiator of action, and thus at
least partly separate from the interlocked chain of events
going on around me. If I'm not in any shape, form or
fashion separate from these interlocked physical events,
then there is simply no point in calling the consequence
'indirect' from the cause. This is a well-established facet
of our justice system; ideally speaking, no man may be held

accountable (in a punitive sense) for results which
followed unintentionally from his actions--because the
result is indirect from the intent. On the other hand, the
same man (or his insurance company) in the very same case
may be held accountable (in a restitutional sense) for
results which followed unintentionally from his actions--
because the results have been proven to follow _directly_
from something he did.

What we see here is yet another result of not consistently
applying the key concepts of a proposed worldview. Mr.
Dawkins would have us believe that every bit of matter and
energy is intricately and inextricably interlocked in a
cause-effect sequence, with no breaking of the system and
nothing added to the system from a source outside the
system. Furthermore, by definition, this would have to
include all our mental acts, which under naturalism can
only be physical reactions and counterreactions. But within
this enclosed and ramparted system, there can (quite
literally) be no indirect consequences. And, to Mr.
Dawkins' credit, at _this_ point he isn't trying to
maintain that "indirect" means anything _other_ than 'lots
and lots of direct steps.' Fine. But then, he must not
switch meanings of the term later and pretend they are the
same. Perhaps he won't; some of his compatriots have tried,
though. (The reader may meanwhile take a moment to consider
the implications of _other_ things he's already written,
and try to figure whether they really fit into this sort of
closed physical system or not.)

b.) If a "fundamental truism" of one kind "still holds",
then by definition others will still hold. That means that
the property of non-intention gets transferred all the way
up the line--to Mr. Dawkins himself, eventually. (Hindsight
note: One can clearly see this in Mr. Dawkins' own example
of the beaver which concludes this chapter.)

c.) By any token one wishes to draw from the implications
of that paragraph, if we "see those links, and marvel at
them", it must not mean what Mr. Dawkins takes such
'actions' to mean in previous chapters. It only means that
we're conditioned to feel such things at such times because
it provides (in its own, small, infinitessimal way) better
probability that our species' genes will replicate. The
very sentence structure assumes that we stand, in some form
or fashion, enough apart from the natural order to
appreciate it. But, that can't be what's really

happening, if philosophical naturalism is true; it's only a
feeling produced by a vastly complicated chemical reaction
which results in the constriction of blood vessels in our
heads and the firing of certain neurons. To us, it feels
like we're marvelling. But we're not. If we were--if we
were actually _judging_ something, which we would have to
be doing to 'marvel' at it--it would by definition be an
event above and beyond the biochemical/biophysical chain of
cause and effect which Mr. Dawkins is constructing (though
of course the biochemical processes would _also_ be taking
place). As long as we're just talking about "marvelling",
this is perhaps no big deal. If we start talking about
arguing as an action, for instance, it becomes a big
deal.

p 135, "DNA can be said to exert power over its own future,
and bodies and their organs and behaviour patterns are the
instruments of that power."

Well, one _could_ say that, but to help prevent accidental
metaphorical slurrage, it might be more accurate to
rephrase this concept: DNA can be said to go through
chemical reactions which, through the chain of cause and
effect, efficiently or inefficiently affect the chances of
that sort of DNA being replicated and passed on.
Particularly efficient results from certain combinations of
DNA naturally produce more of that sort of DNA, which are
just as potentially efficient at producing more of the same
sort, and so on (assuming random mutation doesn't take
place between 'generations', though in fact this happens
occasionally.) Bodies and their organs and behaviour
patterns are at least partly the result of these chemical
reactions, and their efficiency in achieving replication of
the DNA is at least partly a direct result of the chemical
composition of the DNA.

This is certainly a more wordy description than the other;
but it's less likely to leave the impression that the DNA
is 'doing' something in a metaphysical or otherwise
philosophical sense.

The nicely detailed analysis of the (direct!) chain of
cause and effect from result of a chemical misprint in gene
replication to the eventual spread of that gene throughout
the 'cloud of beavers' (if you'll allow me to paraphrase
something from an earlier chapter of mine) is well done;
and since I suppose none of us are requiring that the

beaver _isn't_ doing anything automatic or premeditated,
then I agree the example is not only well-crafted but
useful, too. Certainly Mr. Dawkins thinks highly of the
process (and well he should):

p 137, "It is all perfectly simple, and delightfully
automatic and unpremeditated."

Well, we now have one of two clear problems which he will
have to resolve one way or another. Here are the basic
alternatives:

a.) TBW itself is _also_ a consequence "delightfully
automatic and unpremeditated."
b.) TBW itself is not an automatic consequence; and some
meditation and/or premeditation was involved in its
formation. (Presumably the meditation and/or premeditation
was Mr. Dawkins', though not necessarily limited to him--he
could be using other people's.)

If a., Mr. Dawkins will have to explain in a clear fashion
why we should believe the claims of his book; and also why
we should accept his argument for why we should believe the
claims of his book; and also why we should accept his
argument for why we should accept his argument for why we
should believe the claims of his book; and also... (ad
infinitum). Essentially he's going to have to either give
us an explanation which is itself automatic and
unpremeditated (which would make his statement logically
invalid, even if accidentally true) or he's going to be
stuck in an infinite regress with respect to his
contention. He cannot successfully argue that his general
ability to argue is not actually argument.

If b., Mr. Dawkins will have to explain why _he_ is capable
of meditation and/or premeditation, while the beaver is
not. And he'll have to do this in terms of a closed
physical system where nothing can be added in, and
fundamental truisms (like the basic non-intentionality of
reality) hold true all the way up the chain of cause and
effect--like they have apparently done in the beavers, by
his own testimony.

Frankly, I think either attempted position will be
logically nonsensical; but I suspect he's going to try b.
It's very possible to hypercomplicate the issue to the
point that those fundamentally proposed truisms get lost in

the smoke; but just because the smoke obscures a problem, it doesn't mean the problem has vanished.

Here's something else for you, the reader, to ponder as we leave this chapter. Mr. Dawkins believes that the process from chemical reaction to a race of beavers that builds bigger lodges is "all perfectly simple, and delightfully automatic and unpremeditated." I, myself, did not get the impression from his request that we ignore racist assumptions (and implicitly other "speciesist" assumptions), that he found _those_ processes to be all perfectly simple, and delightfully automatic and unpremeditated. I would be quite willing to agree that the two cases are qualitatively different; but _how_ are they supposed to be qualitatively different on Mr. Dawkins' grounds--provided we don't smokescreen the issues? (One might ask the same question concerning his opinion about boiling that lobster!)

AfGRN;
aka, Chapter 6: Origins and miracles

Well, as the reader may suspect, we're in for Big Fun now!
Although I won't rule out the possibility of a later
clarification, I would suppose that this is the chapter
where we're supposed to _finally_ get to the argumentation
behind all the assumptions (hidden and flaunted) in the
preceeding five chapters. Mr. Dawkins doesn't waste time
before reiterating one of his key assumptions:

p 139, "My thesis will be that events that we commonly call
miracles are not supernatural, but are part of a spectrum
of more-or-less improbable natural events. A miracle, in
other words, if it occurs at all, is a tremendous stroke of
luck. Events don't fall neatly into natural events _versus_
miracles." [italics his]

There is already a very serious problem for Mr. Dawkins'
argument in this chapter, but first I'll deal with a few
minor issues.

I think I'd have to agree with him on that very last
sentence; Christian theists, and proponents of most other
creationistic theisms as well, believe that 'natural
events' and 'miracles' are related to one another in the
same fashion that 'prunes' are related to 'plums'. That is,
all 'natural events' are 'miracles' (because God, a
supernatural Agent, created and maintains Nature) but not
all 'miracles' are 'natural events' (because God and,
presumably, other supernatural entities can introduce
effects into the natural order that are not causally
interlocked back through the entire cause/effect chain of
the system of nature, considered as itself.) To that
extent, even the "backwoods" fundamentalists would agree
that "events don't fall neatly into natural events vs.
miracles." Mr. Dawkins' stance here really appears to be
aimed at some kind of cosmological Dualism: Nature and
Supernature are dichotomized into two distinct classes that
may be considered 'against' each other. But surely this is
a very debateble point; shouldn't the other options be
discussed and reconciled first before lumping us _all_ in
this one group?

p 139, "Given infinite time, or infinite opportunities,
anything is possible."

Well, actually, no. This is faulty logical math. Given
infinite time _and_ infinite opportunities, anything is
possible (though perhaps it would be more accurate to say
'anything not intrinsically impossible is possible'. The
law of noncontradiction would not be affected by this
combination of conditions, for instance.) Perhaps given
finite time and infinite opportunities, anything is
possible (though the probability is still impossible to
calculate--with infinite opportunities, what basis does one
have for determining relative probability or
improbability?) Given infinite time and finite
opportunities, there will remain some impossibilities
(because by definition of the situation, the infinite time
has still apparently left some opportunities closed.) As we
see once we do the logical math, these two situations
(infinite time, infinite opportunities) are not coequal,
even with respect to generating estimates of possibilities
and probabilities.

And in fact, we have neither infinite time nor infinite
opportunities, and to be fair to Mr. Dawkins, he isn't
trying to claim we do or use that as an easy way out for
his theory's plausibility:

p 139, "The large numbers proverbially furnished by
astronomy, and the large timespans characteristic of
geology, combine to turn topsy-turvy our everyday estimates
of what is expected and what is miraculous."

Of course; because these numbers, though large, are
finite and thus (in theory if not in practical
application) computable.

Now for the major problem: Mr. Dawkins has just provided a
definition of 'miracle' which he must know full well
contradicts even what _he_ apparently thinks creationistic
theists believe (i.e., he claims miracles are _only_
statistically improbable _natural_ events--they are
explicitly _not_ supernatural events.) Apparently there
will be no discussion on this matter; hereafter the term
'miracle' will be tossed around as if it _did_, in fact,
mean this, _and_ as though "we" all estimate what is
miraculous based on that criteria. Thus those large numbers
are supposed to overturn "**our**" everyday estimates of
what is expected and what is miraculous." But they don't,
as I shall later demonstrate. It's a topic that must be
addressed, not hammered through as if it were settled. I

might _suspect_ a miracle based on my understanding of the
relative improbability of an event, but I would not equate
it _with_ that. If I tossed my coin once, God (I believe)
is entirely capable of making it show up heads. If He does
so, it _will_ be a miracle, whether I perceive any
improbability in it or not. And in this case, why would I
perceive _any_ improbability? The coin had a 50% of being
heads anyway if He didn't specifically act. This sort of
divine action, which (so to speak) slips in under our
perceptions of probability, has been traditionally referred
to as 'providential' action; but it's still technically a
miracle, as far as I'm concerned, because the causes for
the effect cannot be completely traced back through the
natural chain of cause and effect. (I mean that, given
these conditions, they _absolutely_ cannot; not merely that
_I_ or another human cannot trace them.) Something
supernatural has been added to the natural. That makes the
event a miracle.

I grant that this is a debateable point of terminology.
That is, in fact, exactly _my_ point. It _needs_ to be
debated and settled (if possible) through the debate. But
we're not getting the debate here. Nor are we apparently
going to get it (probably because Mr. Dawkins' argument
requires that the issue is closed; trying to discuss it
before plowing on would, I think, blow the gaffe, so of
course it must be ignored.)

Meanwhile, let's watch him apply some positions which I
have criticised in detail in previous chapters:

pp 139-140, "[Cumulative selection] strings a series of
acceptably lucky events (random mutations) together in a
nonrandom sequence so that, at the end of the sequence, the
finished product carries the **illusion** of being very
very lucky indeed, far too improbable to have come about by
chance alone, even given a timespan millions of times
longer than the age of the universe so far." [italics mine]

Now, let me be fair and point out that, at _this_ point,
Mr. Dawkins is not really saying that something _is_ too
improbable to come about by chance alone (though he says
this sort of thing numerous times elsewhere, particularly
vs. theistic claims.) He's saying that cumulative selection
produces this "illusionary" _impression_, which he rejects.
However, he doesn't reject this impression of the process
because 'too improbable to be possible' is a nonsense

claim; he rejects it because he doesn't think cumulative selection processes result in a vastly improbable state.

Yet the finished product is, as I noted earlier, _still_ extremely improbable indeed, by pure mathematical multiplication of hypotheses (even given that each step was extremely probable in itself, which each step _is not_). Perhaps we may safely suppose even without doing the calcuations, thanks to the characteristics of the sequence, that such a process is not quite as improbable as something which would only be expected to happen by chance once in a universe millions of times older than ours. Nevertheless, Mr. Dawkins' cumulative-step selection process is still massively improbable.

This won't be a problem unless Mr. Dawkins insists on treating improbability for impossibility--for example, the phrase "too improbable to have come about by chance alone" might be another example of something we've seen before in this vein. If it is, it will be misleading on several counts.

a.) It would be misleading because under Mr. Dawkins' own thesis, the mental and/or psychological situation known as 'intent' is not a basic characteristic of reality; and so if we slur the meaning of 'chance' with 'accident' (which Mr. Dawkins occasionally does himself), then Mr. Dawkins is inadvertently providing an argument _for_ creationistic theism! (I don't think I'd accept such an argument myself, for what it's worth, but it hardly helps _his_ goals.)

b.) Much more importantly, it would be misleading because strictly speaking, an event "too improbable to have come about by chance alone" is, as it stands, a nonsense statement. By calling it "improbable", we have by default allowed for a level of concurrent (though inversely proportionate) probability. And for something to be probable, it must be possible. In the movie _Dumb and Dumber_, Jim Carrey asks a woman what the odds are that she'd go out with him. She replies something to the effect of "One in a million." "YES!!" Carrey's character exults. "I've got a _chance_!" It's funny, but strictly speaking it's true. I don't know whether that character was supposed to be 'Dumb' or 'Dumber', but he'd be ahead of Mr. Dawkins here.

c.) Finally, it would be misleading because the textual
construction invites the reader to draw all sorts of
inferences based not on what Mr. Dawkins is advocating, but
purely on the _impression_ Mr. Dawkins is trying to make.
The reader is clearly being invited throughout Mr. Dawkins'
book to _feel_ how improbable something is, and then
conclude from this feeling that the possibility can (or
even must) be discounted.

Mr. Dawkins actually recognizes a potential problem with
his setup, which is well-described in the full first
paragraph of p 140, but can be summarized with his
observation that: "Cumulative selection is the key but it
had to get started, and we cannot escape the need to
postulate a _single-step_ chance event in the origin of
cumulative selection itself." [italics his]

If Mr. Dawkins had not gone to such trouble to dichotomize
(falsely, as I have argued) single-step and cumulative step
processes into primarily inorganic and organic
biochemical/biophysical reactions respectively, and had
rather recognized that practically every event in an
intimately interconnected physical set is part of a
cumulative process (especially the Nature recognized by
science and heavily promoted by naturalistic philosophers
like Mr. Dawkins himself), this would not be a problem. Or,
rather, the problem would have been pushed back to the same
debate which physicists are still puzzling over: whether
the math and apparent observations of material behavior
argue for a spontaneous start for nature (calling it
"creation", even without a Big C, would be slurring a
naturalist's terms more than a little!), or whether the
math and the data give us an eternal physical universe
where the properties of time-flow compress or break-down as
we move closer to what _appears_ (but only appears, under
this theory) to be a Big Bang. The second theory states
that it's wrong for us to measure time near the Bang in
that way, since all the factors for our ability to measure
time come _from_ the natural universe, barring some kind of
supernatural perception. This is similar to the axiomatic
truth that if the room you're sitting in, and _everything_
in it (down to basic physical particles) were getting
smaller, and you had no access to something independent of
the room to use as a standard, then you'd never be able to
tell it was getting smaller.

Note: One might suspect that the fact we're all supposed to be utterly products of physical nature and yet we can tell the universe is getting bigger, would be a problem for naturalism. However, to be fair, it's probably not; our standards for size measurement are the ultraprecise wave-frequencies of certain excited elements, which are demonstrably not getting bigger with the universe (if I've understood the argument correctly)--and thus we have an objective standard of physical measurement. On the other hand, it does rather beg the interesting question of what we're supposed to be getting bigger _into_, which seems to argue back again that nature is in fact eternal and infinite. The problem tends to ping-pong back and forth a lot at this point, but tracing it is outside the scope of my book.

Now, if this second theory is true and nature is infinite and eternal, and if (as I've tried to argue) cumulative-step events are the vastly overwhelming 'normal behavior' of natural process (possibly excluding quantum mechanics), then Mr. Dawkins would not _need_ to postulate a truly single-step chance event at all. On the other hand, if there really is a Big Bang and nature is not eternal and infinite after all, then he might as well simplify his single-step problem into one place (the Bang itself.) He'd still have the naturalistic problem of getting around the Bang, which appears to violate fundamentally intrinsic laws of logic if nature is all that exists, but better to have one problem instead of more than one. Personally, I would think either option would make his theory stronger; and if the other categorization he's tried to establish really serves no preconceived arbitrary exclusion function (though I suspect it does), then I suggest he reinterpret his categories along these lines, if he hasn't done so already (though his remarks from his 1996 introduction to TBW, which I'm reserving comment on for one of my own concluding chapters, would seem to imply that he hasn't applied this as an improvement yet.)

Meanwhile, he's got to find a way around this problem on the grounds he's tried to posit in this book (cumulative-step events are essentially limited to--arguably--'living' organic compound reactions.) He'll taking an interesting stab at it later in this chapter.

As we move to p 141, let me point out that my criticism of _this_ point is _not_ what _I_ consider to be "a

fundamental flaw in the whole theory of the blind watchmaker." Flagrant presupposition of positions as necessary premises for purposes of attempting to build an argument in favor of the presupposed ideas (for example that God does not exist) would be an example of a fundamental flaw in Mr. Dawkins' theory--and will, in fact, be a fundamental flaw in any naturalistic philosopher's theory, if he tries to use it. It's a systematic flaw no matter who uses it, and I've seen some creationistic thesists try it, too--the point being that I'm making this observation on grounds of systematic analysis, not on specifically 'Christian' grounds. I would make the same criticism if _I_ were a naturalist--or a pantheist, or Dualist, or polytheist, or whatever. It's an ideology-neutral observation. And it should be obvious by now that I've made numerous other serious systematic criticisms of Mr. Dawkins' methodology (a summary of which will appear in my 12th chapter). As I've maintained from Chapter 1, this _particular_ criticism is practically a _friendly_ criticism--I'm actually giving advice which could improve my opponent's position to the (possible) detriment of people's perceptions of my own position's relative strength! What I would like you, the reader, to do is objectively and seriously pay attention to the _way_ in which Mr. Dawkins formulates his theories; and, if you judge my criticisms to be valid, to honestly apply them to other philosophical naturalists (like Daniel Dennett, for instance, whom Mr. Dawkins is a fan of) if you see them taking those positions. For that matter, if I'm going to be fair, I also invite you to apply them to proponents of my own position (Christianity)--even, as painful as it may be, to my own work. You may discover you were already doing it against some Christian writers of your acquaintance (like some of the straw men Mr. Dawkins has strung up), but had somehow missed doing it with writers like Mr. Dawkins himself. But fair is fair.

Meanwhile (and you knew I wasn't going to ignore it forever), let's move on to Mr. Dawkins' brief (explicit, for a change) philosophical foray in the second paragraph of p 141. His contention here is that an attempt to argue the existence of God from the concept that complicated things produce complicated things,

"...is a transparently feeble argument, indeed it is obviously self-defeating. Organized complexity is the thing that we are having difficulty in explaining. Once we are

allowed simply to _postulate_ organized complexity, if only
the organized complexity of the DNA/protein replicating
engine, it is relatively easy to invoke it as a generator
of yet more organized complexity... To explain the origin
of the DNA/protein machine by invoking a supernatural
Designer is to explain precisely nothing, for it leaves
unexplained the origin of the Designer. You have to say
something like 'God was always there', and if you allow
yourself that kind of lazy way out, you might just as well
say 'DNA was always there', or 'Life was always there', and
be done with it."

Now, you probably expect me to flame this--and you're not
completely wrong! I'm even going to include a criticism
from a direction that you might not guess if you've been
skipping around in my book (though if you've been paying
attention you should be able to guess it.) But before I get
to torching, I want to be fair and point out that Mr.
Dawkins is (rather clumsily) putting forth _some_ valid
philosophical contentions that have a bearing in the
atheist/theist debates. I'll try to make these points clear
as I go along.

Let me start by giving him credit for the last sentence,
which touches on a useful point in philosophical argument.
The problem is that he actually guts it of what force it
has as a naturalistic defense against certain theistic
arguments, when he tries to get away from the concept of
organized complexity. One of toughest problems (though not
the toughest) in naturalistic philosophy is that it seems
to imply that very simple non-complex objects have produced
objects far more complex. Indeed, some naturalists are
adamant that this has happened, and finagle more and more
intricate theories to explain this astounding event and how
it's supposed to be able to occur. These hypothesized
processes themselves often have their own problems, but the
point is that for _this_ sort of contention-of-principle, I
myself would not be bothered if I were a naturalist. The
physical universe is _already_ minutely and mind-bogglingly
complicated, and despite Mr. Dawkins' opinion of the
'simplicity' of the state of the universe shortly after the
Bang, it has really always been so. All the reader needs do
is check some doctorial theses (or even some _Discovery_
magazine articles) on shortly-post-Bang atomic and sub-
atomic states, and I am fairly confident you will reach the
same conclusion! The _spread_ and _configuration_ of the
disparate _parts_ of physical material (by which I mean

matter and energy both) tend to clump together in
particular ways over time, but the physical universe itself
as a going concern (which is quite literally _everything_
that a naturalist is supposed to believe exists), is no
more complicated now than it ever was; and it's certainly a
logical fallacy (within naturalistic philosophy) to try to
posit that any given clumping of material is somehow _more_
complicated and organized than the whole of nature.

In this, theism and naturalism (if the naturalists would
only remember the implications of their doctrines, which
I'm sure some do) are quite agreed: the ultimate Fact, the
thing we can't go behind, that exists purely of itself and
is not caused by other entities (sentient or non-sentient),
must be by definition the most articulated, complicated and
detailed Fact in existence--should be infinitely so,
technically speaking. Nothing is more 'real' than it is,
nothing is more 'complicated', because everything else
(even if the 'everything else' is essentially a useful
legal fiction, as in naturalism) depends upon it. Theism
and naturalism stand _together_ in this matter against
practically every cosmic Dualism I can conceive of, as well
as against certain forms of abstracted pantheisms.

(Cosmic Dualisms, by default, posit two equally and purely
Independent Facts or Most Complicated and Real Things--God
and Nature, or God and Anti-God, being the two most common-
-and so stand, at least at face value, against theism and
naturalism which both posit one IF. Certain pantheisms,
though perhaps not all, strip away all positive attributes
from the Final Fact and never even pretend to posit
something else in their place, leaving us with an absolute
zero which is somehow _still producing_ what we think is
reality. These tend to be the 'reality is illusion'
pantheisms, since the obvious conclusion from this is that
if final reality has no determinate facts, neither can
anything else, including what we take to be 'real'.)

The reader should see that in principle, there is no
problem here for naturalism, since under any circumstance
what is being 'produced' (i.e., what Mr. Dawkins keeps
labelling as exclusively cumulative-step selected entities)
is not in the least more complicated or articulated or
organized than what is producing it: the whole of reality
itself. Nor could cumulative-step selected entities be less
so, as far as I can tell from the implications. They look
less or more to _us_ from our vantage point (and the fact

that we can form this illusion or judge this disparity
doesn't bode well for naturalism, in my opinion, though
I'll ignore that for the moment); but it's really not. The
naturalist may have some problems with this concept if the
Big Bang really was apparently from nothing physical--i.e.,
if the physical universe is not in fact infinite and
eternal--but, that's a problem he has to get around anyway,
if true, so an extra problem hasn't arisen. Mr. Dawkins
himself bears an oblique witness to this problem when he
writes, above, "To explain the origin of the DNA/protein
machine by invoking a supernatural Designer is to explain
precisely nothing, for it leaves unexplained the origin of
the Designer." The problem is that _whatever_ we posit as
the final, ultimate Fact must be self-existent and eternal
anyway; be it Nature or God. No theist I'm aware of--
certainly not any of the traditional versions of the Big
Three (Judaism, Christianity, Islam)--has a problem with
this. This should be something Mr. Dawkins either
understands and sympathizes with (if he himself thinks
nature eternal), or should be tacitly worried about (the
universe has an origin and so is either dependent on
something else which by definition would be supernatural;
or the law of noncontradiction is invalid which undercuts
the potential validity of _all_ theories, Mr. Dawkins'
included.)

For what it's worth, Christianity is the only philosophy
I've found that provides a cogent description of Self-
Grounding at work. As with any posited Independent Fact,
part of God's eternal action would have to be the grounding
of Himself; essentially the generation of Himself. The best
analogy of this we can find is 'begetting' Himself; and
'begetting' implies a 'begotten'. (Note: although the word
originally referred to the consequences of a sexual act,
that's not how theologians use it. Something 'begotten' is,
in type, the same sort of thing as the entity which
'begets' it. Something 'created' is not. Humans 'beget'
humans; we 'make' chairs or statues. This also has nothing
to do with the Virgin Birth contention.) Another way to put
this is that at least one of the things God generates has
to have fully equal divine status--Himself. But the action
and the result can be distinguished as such; yet in this
one singular case (His own self-generation) they must also
be so intimately unified as to be inconceivable apart from
one another. This is where the concept of the 1st and 2nd
Persons of God comes in (I'll leave aside why we think
there's an equally eternal 3rd Person which is itself part

of this eternal transpersonal unity.) The distinction of
begetting and begotten (metaphorically speaking) is
necessary for Self-Grounding, but the uncompromised unity
of being is a necessary characteristic of an Independent
Fact. And, of course, the sentience of both principally
distinguishable elements of this entity is a must if we're
going to talk of Him as God. (The use of the series of
capitalized masculine nouns follows from ancient tradition
which I won't get into here, but since we have no neuter
personal pronouns in English, we have to default to a
gender set. In traditional English, completely aside from
theology--though perhaps not sociology--this non-gender
placeholder tense has been the masculine.) Thus a
trinitarian monotheism describes a Sentient Independent
Fact in the act of self-grounding, and also provides
answers to some ancient and quite cogent questions
regarding such things as 'Why should God or any other IF be
an objective source for morality?' and 'If consciousness
requires perception of an "other", as it appears to imply,
wouldn't that mean a God--or Consciousness--existing
"prior" to creation makes no sense?' (Note: this second
question may also be sufficiently answered by strict
monotheists by restricting the use of 'prior' to logical
causation rather than temporal sequence, the latter of
which may be a meaningless concept when dealing with the
Eternal anyway.)

But I won't press this issue further in this book. The main
point I want to make here is that I acknowledge that a
naturalist has to have his own (non-Sentient) Independent
Fact which he's positing for his theory--the physical
universe, or Nature--and I accept that by definition this
must be self-grounding somehow, assuming it is the IF. Just
because my own belief happens to give me a rather useful
picture of this process (though a _hard_ one to picture--as
Lewis says, it's like trying to describe a cube by drawing
it on paper, which either seems to obliterate the unity or
the distinctiveness of the square sides because of the
natural limitations of 2D drawing), it doesn't necessarily
serve as evidence that Christian theism is correct. It
solves some problems that naturalism doesn't strictly have,
but that's hardly an exclusion of naturalism (except maybe
in the case of objective morality issues). And meanwhile
the implications of Nature as a n-SIF seems to me to solve
the problem which Mr. Dawkins is raising at this point in
his book.

Again, I think I've actually made the naturalism argument a bit _stronger_ (at least on the face of it)! How could I possibly be more fair than seriously suggesting some _improvements_ in his argument!? Of course, my doing so tends to (in turn) gut the grounds of anything Mr. Dawkins intends to spin out of this (unless any of those ostensible conclusions can be supported by other more valid arguments--not that I've seen any yet as of this point in the book!) But it doesn't leave the topic without some hope of rennovation, improvement and better internal consistency.

Next criticism, and this is far more serious: Mr. Dawkins, in the above extract, illustrates profusely that he clearly recognizes that attempting to argue to a conclusion by assuming the conclusion as a necessary premise, is a logical fallacy worth no one's time (except in refutal.) I agree, obviously! But Mr. Dawkins should take this seriously enough to do a self-reflexive check of his own line of argumentation and see if it still stands by applying the same principle. He apparently hasn't, though; even before he reached page 10 he'd already shot his argument so thoroughly in the head that everything else I've written after that is practically an afterthought (as well as an extended lesson in the sorts of things a serious reader of this sort of literature should be watching for in other works--mine included, admittedly. Please note: I did not, by analysing the doctrine of the trinity in terms of self-grounding, argue _for_ the existence of God, nor was I intending to; I merely was sharing how a particular doctrine seems to me to provide an illustration of a process which must be going on, no matter who is correct. Had I attempted to use it a positive argument, I would have been guilty of presuming my conclusion. Though I suspect there is a way of reformulating my observations to make it a primary argument, I won't try it here.)

p 141, "The more we can get away from miracles... [and] large chance events, and the more thoroughly we can break large chance events up into a cumulative series of small chance events, the more satisfying to rational minds our explanations will be."

a.) I rather resent the totally unfounded implication that a belief in miracles is irrational, especially since he's completely assumed it in this book with no argumentation whatsoever to that effect. The reader will note that I have never once accused Mr. Dawkins of irrationality.

Inconsistency, circular argument, invalid presuppositions
of ostensible conclusions, yes. Irrationality, no. A misuse
of argument is not, in itself, irrational, even if the
misuse is not intentionally calculated to mislead. Honest
mistake and dishonest rigging are both, as far as they go,
rational actions. Of course, it's entirely possible I've
misunderstood him, and he actually only meant that since
miracles and large chance events are invalidly used in
argument, the more we can stay away from them, the better
satisfied (_as_ rational people) we will be.

b.) Since we're in that vein, Mr. Dawkins hasn't given one
shred of usable evidence or argumentation to the
conclusion that the use of a supernaturalistic miracle as
part of an explanation renders that explanation invalid
(much less that there flat-out _is no_ supernature). He has
assumed it, spot-on, all the way through the book. One of
the purposes of an exhaustive analysis, page-by-page like
this, is _precisely_ so I can illustrate this.

c.) A large series of cumulative chance events is still
massively improbable, as demonstrated by multiplication of
fractions; even if the probability of every particular step
(considered in itself) is very high.

d.) But even the _particular_ steps he's describing (the
random mutation of a gene sequence) are themselves still
extremely improbable, even if not as improbable as his
single-step selection process example. Taking points c and
d together (or even flat ignoring d) leaves _my_ rational
mind only negligably more satisfied than if I consider
nature single-step 'poofing' species into existence. And
such contentions have nothing to say, except by sleight-of-
hand category switches, against creationistic theism in any
form; be it instant creation, six-day development, billions
of years development, directed all the time, directed
partly, just created and not directed, or any combination
thereof. Any of these proposed events is quite literally
impossible to calculate probabilistically; and there's a
HUGE difference between 'impossible to calculate
probabilistically' and 'grotesquely improbable'. It's a
category difference: can't calculate, can calculate. But,
that's not enough of a category switch for Mr. Dawkins; he
must go on after switching illegitimately to 'grossly
improbable' (and not even bothering to give a reason,
though there's no valid one he _could_ give so I guess it's
just as well) and then invite the reader to switch _again_

to straight-out 'impossible'! Even Hume didn't try that
(though he got as close as he dared!)

But even Mr. Dawkins can't keep _that_ switch going
consistently without endangering his own contention, so now
we're brought _back_ to a (temporary) attempt to properly
distinguish probability and possibility.

p 142, "Nobody can really comprehend or imagine such a
large number [as the single-step monkey probability of
producing 'METHINKS IT IS LIKE A WEASEL'], and we just
think of this degree of improbability as synonymous with
impossible. But although we can't comprehend these levels
of improbability in our minds, we shouldn't just run away
from them in terror."

Neither should we consider them synonymous with impossible.
I think "running away from it in terror" is not a bad
description of what Mr. Dawkins would like the reader to do
with respect to that 1x10E40 number; reject and run away
from it, and over to, say, a 1x10E20 number. Ever tried to
imagine the odds related to a 1 with 20 zeroes after it?
Guess what; it's about as likely to scare you as a 1 with
40 zeroes. But it's just a number, not something to be
scared about? So is the other. But the 1x10E20 is
mathematically more probable, so we should bet on it?
Certainly--_assuming_ you have already ruled out on
evidential or logical grounds the possibility of tampering
from outside the system. But even _that_ doesn't mean the
1x10E40 possibility number _didn't_ happen.

Given a pair of dice with six sides, each with a side
represented with a non-repeated integer from 1 to 6 (i.e.,
a normal pair of casino or Monopoly dice), it is entirely
more probable _OTHER THINGS BEING EQUAL_ that I will roll a
number totalling seven rather than a number totalling
twelve. _GIVEN THOSE CONSTRAINTS_, it is impossible for me
to roll a thirteen. But the question is precisely _whether_
those constraints hold, or whether before my roll I can
(for instance) slip two dice, which contain only fives,
sixes, and sevens on them, from my sleeve. The laws of
probability won't be "violated" by throwing them; they
wouldn't even be violated if one die had only sixes, and
one had only sevens. The laws will perfectly illustrate the
actual situation; the mistake will have been in our
estimate of what that situation was. The laws of
probability aren't even violated if I toss the regular

dice, then lean over and switch both faces to six and add
one more die turned to 'one', to make a total of 13. They
aren't violated because they just don't apply to that
situation! And remember, even back on the randomly rolled
regular dice, twelves _are_ still occasionally rolled (in
the long run, one twelve will _probably_ be rolled every 36
times; and the longer the roll, the greater the probability
this proportion will show up--assuming honest dice and no
interference from me.)

The history of our physical universe has only happened once
(a somewhat debateable concept, but to me it seems
necessary for naturalistic philosophy, and I'm not inclined
to dispute it anyway.) We're here. Assuming philosophic
naturalism is true, either (analogically speaking) 1x10E14
million dice turned up 1s (and then all the other steps
which each have about a million to one probability of
occuring occured), or 1x10E34 million dice turned up 1s and
humanity popped, more-or-less in our current form, into
existence. Both options are entirely possible, and merely
looking at the hindsight results we cannot say with
certainty (though we can reasonably bet) which one of them
happened. If we have other evidence that one of them
happened, then there's no need to apply to probability. And
meanwhile, neither option has any bearing on the question
of whether Someone (analogically) could, or did, roll a
bunch of loaded dice, or fiddled with the dice after
rolling them. Those readers who, like myself, occasionally
play role-playing games where we have to roll a character's
stats should understand _this_ concept _very_ well! Those
readers who play the craps tables and hold their dice in a
certain way so certain numbers 'are more likely to show
up/not show up', should also understand very well. (That
really doesn't seem to work, by the way, thanks to the
bouncy convoluted foam ringing the craps tables and the
minimum distance from which the croupiers make you throw;
but the general principle is the same.)

All of which can be summed up (yet again) in two brief
responses to the following quote:

p 142, "The miracle of a monkey typing 'Methinks it is like
a weasel' is quantitatively too great, _measureably_ too
great, for us to admit it to our theories about what
actually happens." [italics his]

a.) The definition of 'miracle' used is question-begging and game-rigging so that the actual contentions of supernaturalistic theists can never even get on the table for consideration;

b.) The rest of the sentence is a vast category error. Surely this insistence that improbability equal impossibility is tied to Mr. Dawkins' equation of 'miracle' with 'vastly improbable natural event'. How conveniently circular!

The rest of this chapter is saturated in similar game-rigging nonsense; and it would be tiring for everyone involved (even myself, as hard as that may be to believe!) if I extensively commented on every solitary instance of it. However, it is patently obvious that vast numbers of readers have sailed serenely right on past these instances, so I think there is some benefit in illustrating just _how much_ of Mr. Dawkins' argument depends on this process. Therefore, I will be noting numerous specific examples as I go this chapter; but if they essentially follow the process I've illustrated above, I'll encapsulize my analysis of them in this acronym: AfGRN (Argument from Game-Rigging Nonsense, which may be pronounced Af-grin.) By this, I mean the _specific_ combination of game-rigging and logical nonsense (or, on occasion, one element temporarily extracted) which I have just summarized in my a/b reply to the immediately preceeding quote from p 142. (I have to make this distinction, because the entire book is filled with logical nonsense and with game-rigging, but of widely different types.)

p 142, "So, there are some levels of sheer luck, not only too great for puny human imaginations, but too great to be allowed in our hard-headed calculations about the origin of life."

AfGRN.

p 142, "But, to repeat the question, how great a level of luck, how much of a miracle, _are_ we allowed to postulate?" [italics his]

AfGRN.

The following section from pp 142-143 illustrates profusely that even Mr. Dawkins agrees with me about systemic

fallacies in argument stemming from a confusion of possibility, probability and certainty; and also fallacies stemming from building in as a necessary prerequisite the conclusion the argument is supposed to be reaching. I invite the reader to compare Mr. Dawkins' judgment here with the methodology in which his own argument is steeped. I'll quote the entire section for the benefit of people who may not have TBW handy. All italics in the following quote are his.

"Some people have calculated that there must be life elsewhere, on the following grounds (I won't point out the fallacy until afterwards.) There are probably at least 10^20 (i.e. 100 billion billion) roughly suitable planets in the universe. We know that life has arisen here, so it can't be _all_ that improbable. Therefore it is almost inescapable that at least some among all those billions of billions of other planets have life.

"The flaw in the argument lies in the inference that, _because life has arisen here_, it can't be too terribly improbable. You will notice that this inference contains the built-in assumption that whatever went on on Earth is likely to have gone on elsewhere in the universe, and this begs the whole question. In other words, that kind of statistical argument, that there must be life elsewhere in the universe because there is life here, builds in, as an assumption, what it is setting out to prove. This doesn't mean that the conclusion that life exists all around the universe is necessarily wrong. My guess is that it is probably right. It simply means that that particular argument that led up to it is no argument at all. It is just an assumption."

You will note that _here_, for a change, Mr. Dawkins plays fair. Despite the fact that he _guesses_ (based on the probability estimate, I suppose) that the conclusion is probably right, he understands perfectly well that he cannot logically use this apparent conclusion to bolster his own argument concerning the relative probability or improbability of life evolving on earth. Even though such a conclusion would be amenable to his belief and helpful (on the face of it) to his argument, he understands that it's not really a conclusion but a question-begging assumption dressed out as an argument. So he's going to set it aside and try something else. See? I'm not just making these

principles up! But then he has to apply them consistently
to his own argument, and this is the rare exception.

Middle of p 143: despite his usual backhand against the
small-mindedness of the church (he qualifies that as "the
medieval church", and I can agree in being glad that we've
managed to get beyond the small-mindedness of some of their
beliefs, though I suspect the comparative lists of such
beliefs between Mr. Dawkins and myself would be largely
dissimilar), Mr. Dawkins does make a good point when he
refutes the following argument:

"How very conceited to assume that, out of all the billions
of billions of planets in the universe, our own little
backwater of a world, in our own local backwater of a solar
system, in our own local backwater of a galaxy, should have
been singled out for life? Why, for goodness sake, should
it have been _our_ planet?" [italics his]

Remember, Mr. Dawkins does _not_ accept this line of
argumentation--he quite clearly sees that such an argument
relies on "empty rhetoric" about backwaters, etc.
Essentially, it's an emotionalistic appeal to the awe of
the size of the universe as a ground for the concept that
there _must_ be other life out there; and as such, it is
invalid as argument. For a change, he _doesn't_ confuse
probability with possibility: "It is _entirely_ possible
that our backwater of a planet is literally the only one
that has ever borne life." [italics his]

I note this, not only to be fair to Mr. Dawkins and give
him credit for scoring points, but also to remind the
reader of something I've brought up in a previous chapter:
such an argument is _also_ invalid as a means of
undermining creationistic theisms of any sort, including
pretty much any variety of Christianity. I'm not entirely
sure whether Mr. Dawkins subscribes to this attempted
undermining; but his comment on the "absurd
presumptiousness" of the medieval church's teaching about
Earth being the center of the universe and the stars being
pinpricks in the sky for our benefit, seems to imply that
he does. After all, given the state of our scientific
knowledge back then, such a conclusion was virtually
inevitable and should be easily forgiveable.

It also implies that the medieval church gave the Earth
some sort of priority with this belief; but nothing could

be further from the truth. A spatial cosmology with Earth
as a 'center' comes not from Judeo-Christian teaching--
which has nothing to say about _spatial_ cosmologies at
all--but from the church's synthesis and application of
Aristotalianism and Platonism. To put it rather
indelicately, the medieval church believed the Earth was
the spatial center of the universe, not only because all
the available observational evidence at the time pointed
that way, but also because crap runs downhill. The Earth
was considered the universal sump due to its fallen
condition. (Note: Dante's _Inferno_ provides perhaps the
most popular surviving illustration of this concept from
the Middle Ages.) From Aristotle they borrowed the idea
that all things tend to move toward the idealization of
their Forms (the 'roll downhill' part); and to this they
added an amplified version of humanity's/physical nature's
tampered condition which approached (for purposes of
developing a spatial cosmology) Plato's belief in the
inherent evil of matter--something not really paralled in
either the Old or New Testaments. When a sun-centered
spatial cosmology was first posited, it wasn't due to new
observations but because it was deemed more philosophically
'fitting' within the boundaries of neo-Platonism: the Sun,
considered at the time as a non-material object, was an
ethically 'better' object than the Earth. (It also made
orbital calculations somewhat easier, but only moderately
so--this was considered merely a side benefit.)

The switch in ideas came from a change of perception about
whether the center of space should be the best or worst
place in the natural world. And the switch to a
heliocentered spatial cosmology occurred during the same
Middle Ages--for primarily _philosophical_ (and not even
theological) reasons. Go back and check the actual writings
and contemporary records of the scientists of the Middle
Ages, and you will discover pretty quickly that the debates
were not between emerging 'science' and theology, but
between philosophies _within_ a Christian (or otherwise
creationistically monotheist) context or perhaps between
theology and theology.

For example, Giordano Bruno pitted his hermetic pantheism
vs. the Roman Catholics--and also championed heliocentrism
because it fit his _philosophy_. In the Church records
against Bruno, their remarks about heliocentrism were
mainly along the lines of 'Duh! What actual physical
evidence is there for this? None!' (Which, at the time,

there wasn't. Even Bruno didn't present physical evidence.)
The church burned Bruno at the stake not because the church
had a Christian committment to a geocentric spatial system,
but because Bruno was actively preaching a revival of
animist pantheism, using heliocentrism as a convenient
means to back his _religious_ view. The church switched to
heliocentrism when neo-Platonism began to replace
Aristotaleanism as the dominant means of philosophically
interpreting Christian theology (itself a largely separate
set of ideas); and the church did so quite a while _before_
properly scientific observation began to confirm
heliocentrism. Indeed, Isaac Newton first gave
heliocentrism the mathematical backbone to 'work',
scientifically speaking; but he did so as part of an
attempt at orthodox Christian apologetics! (Newton's
numerous volumes on Christian prophecy are largely ignored
by modern 'historians of science', dating back to Voltaire
and the Enlightenment. I wonder how much of this is news to
the reader? The mystical, religious and philosophical
contexts of the scientific theories of the Middle Ages have
been summarized and documented quite nicely by Nancy R.
Pearcey and Charles B. Thaxton, in their _The Soul of
Science: Christian Faith and Natural Philosophy_, which I
highly recommend.)

The church (along with everyone else at the time) had no
reason to believe that earth-like conditions were
replicable even in theory 'elsewhere'. They (along with
almost everyone else in Western Europe at the time)
believed for _whatever_ reasons that they had the story in
Genesis 1 & 2 to go by and believed that story to have been
given to them by God to illustrate some kind of central
truths. Given all that, it seems to me entirely excusable
that they should have come up with these beliefs,
interpreting Genesis 1 & 2 through the data they had access
to _at the time_. Calling it "absurd presumptiousness"
seems to be begging the question, and also implying that
they should have known better. I grant that by using this
data to intepret Genesis, they lent the _data_ a false
theological emphasis which the _data_ should not have had,
and they then erred when the _data_ began to be corrected.
Even this error was, I think, less absurd presumptiousness
than a panic built on sloppy theology (as well as a social
power issue.) So why does Mr. Dawkins call it "absurd
presumptiousness", when given what these people had access
to, it was a practically inevitable belief? Because
advocating such beliefs today would be absurd

presumptiousness? True, but it's a non-issue--few if any
people today (Christians included) believe that the Earth
is the physical center of the universe and the stars are
mere pinpricks.

"But," the reader may say, "he perhaps meant that it's
absurd presumptiousness to believe today that the Earth
could be singled out for the sort of divine actions which
God is supposed to have taken according to your Scriptures,
and/or to believe that God set the stars in the sky for
our benefit!" Perhaps he does mean that; I don't know.
But I do know--as Mr. Dawkins has just amply illustrated
himself--that such an argument against creationistic theism
is a fallacy. When we're dealing with a proposed
omniscient, omnipresent entity, what _we_ conceive of as
the relative "backwater"ness of our own planet is a non-
issue. Also, what real logical significance does size have
to 'importance' anyway? Mr. Dawkins just illustrated the
fallacy of arguing from that category error on another
topic! I seriously doubt that the reader secretly believes
a 5'6" man to be slightly more important than a 5'4" man
and then dismisses the difference because it's irrelevantly
small. (In fact, most Western Democratic readers would
probably quickly and hotly deny that size makes any real
difference in importance in _this_ respect.) This sense of
'importance' only shows up when the quantities imagined are
so large that our minds cannot easily (or at all)
comprehend them. It's purely a feeling; the awe of the
sublime. Recognize this (and recognize that most of us
already recognize and apply this in practically every other
endeavor), and the argument against creationistic theism on
this ground falls to pieces.

And anyway, this sort of contention, when applied against
specifically Christian claims (that God Incarnated Himself
as a man to die for our sins), is especially perverse,
because no Christian claims (or at least should claim) that
God did this because of any intrinsic importance of _ours_.
We think God did it because He loves infinitely. We're not
told that the one lost sheep in the parable was the
biggest, or the smartest, or the most valuable to the
shepherd--but it was lost and hurt, and the shepherd went
out after it. (Come to think of it, Jesus' tendency to
describe humanity as sheep, explicitly or implicitly, while
perhaps endearing is hardly flattering to _us_!)

As far as the question of whether the stars serve a purpose
for us intended by God: I expect they do, mainly because
they have (served purposes not adverse to the character of
God, I mean.) Were they made specifically for one single
purpose? No, I expect they weren't. This is a reductionist
complaint that Christians today need not worry about
(though we've certainly been guilty in the past of talking
as if everything in creation was done for strictly one
purpose, usually for one particular benefit of mankind.)
This has long been a part of Christian doctrine ("all
things are done for each" and "the highest does not stand
without the lowest" as the creedal statements go), and even
of Jewish doctrine (e.g., the Psalms that sing about the
wonder of certain things that were obviously not created
for Man and serve no obvious purpose _for_ Man.)

"But don't Christians say that there cannot be
extraterrestrial life?" the reader may reasonably ask (as a
related topic). I say 'reasonably', because some Christian
theologians (and some preachers whom I don't count as
theologians--as Asimov once wrote, "Anyone can call himself
a biologist"!) have indeed said this. I do not agree with
this precept; and the question of extraterrestrial life
holds little importance to me theologically. I've yet to
see a cogent theological argument against extraterrestrial
life, and I'm certain that Scripture makes no positive
exclusionary statements in that direction. Indeed, the
positive statement which Scripture _does_ make is that we
and God aren't the only rational entities in creation,
though the entities it actually discusses are considerably
more supernatural than we are. And one _could_ tease out
some hidden implications here and there; the shepherd went
after the one lost sheep, but there were 99 completely safe
sheep back in the pen! But I have no interest in doing so.
I think the doctrines as they actually stand (our often
exclusionary interpretations aside) leave the question
open; and it's for science to discover the rest. The
existence of extraterrestrial life, in and of itself, in no
way threatens the central theology of Christianity. Moving
on...

p 144, "This is obviously such a small probability that we
haven't the faintest hope of duplicating such a
fantastically lucky, miraculous event as the origin of life
in our laboratory experiments."

AfGRN. We shouldn't _expect_ to duplicate it, but that's a different concept than not having "the faintest hope".

p 144, "Yet if we assume, as we are perfectly entitled to do for the sake of argument, that life has originated only once in the universe, it follows that we are _allowed_ to postulate a very large amount of luck in a theory, because there are so many planets in the universe where life _could_ have originated." [italics his]

This of course _assumes_ (purely on hypothetical estimate) that there really _are_ so many planets in the universe. We _think_ there should be, based on our current understanding of astrophysics. We don't actually _know_ that there are. It's still a guess, not even close to a certainty, and a very qualified guess.

p 145, "...even if the chemist said that we'd have to wait for a 'miracle', have to wait a billion billion years..."

AfGRN, this time just the game-rigging part.

p 145, "A miracle is translated into practical politics by a multiplication sum."

AfGRN, though again just the game-rigging part.

p 145, "There is a concealed assumption in this argument. Well, actually, there are lots..."

Agreed. Including some I've had to air out that should have prevented TBW from being so well-received.

p 145, "To be more precise, the maximum odds against the origin of life on any one planet that our theories are allowed to postulate, is the number of available planets in the universe divided by the odds that life, once started, will evolve sufficient intelligence to speculate about its own origins."

This is probably an accidental terminology error; what really happens is that we _multiply_ the two numbers together, not divide. This is also known as the _product_ of the probabilities, as Mr. Dawkins himself notes near the end of the next paragraph, and (as he notes) it results in a far smaller probability. That means the original maximum odds _against_ are _increasing_ rather dramatically!

Thus if I have a 20% chance of slam-dunking a basketball
and a 1% chance of shattering the backboard _given that
I've successfully dunked_, then my chance of shattering the
backboard _before_ I dunk on any given occasion is .2 x
.01, which equals .002 or .2% (ten times less likely than
even a 2% chance.) This is why the multiplication of
hypothesis series he postulates back in Chapter 4, among
other places, doesn't actually _help_ a probability
estimate, though the final number may in fact be more
probable than the odds in favor of a single-step event.

However, I'm not sure Mr. Dawkins even applies _this_
correctly. He speaks (bottom of p 145, top of 146) of using
a 'ration of luck'. He speaks of spreading this ration of
luck between probability of life arising on any planet
(arbitrarily set to be the maximum number of _assumed_
planets in the universe) and the probability that any of
that life should get to our stage (the probability
generated by his multiplication of hypothesis in
cumulative-step selection which we saw back in Chapter 4,
among other places.) Put together, this is essentially the
probability that this _entire_ process accounts for our
existence as we are, setting aside temporarily certain
problems I've already mentioned regarding the principles
involved in, for instance, non-rational to rational. But
what is this 'ration of luck' itself? He appears to be
getting it from the number of eligible planets in the
universe. If we "use up all our ration" of this luck "in
our theory of how life gets **started** on a planet in the
first place" [italics mine], then we _don't_ get to carry
that over to the other probability. The description of the
process reeks of nonsense. Exactly how do we go about
deciding when this 'ration of luck' has or has not been
"used up"?

Given my 20% chance of dunking a ball, I should expect to
dunk it once out of every five attempts. (I'll set aside
for the moment that even this issue isn't an ironclad
certainty for what _actually_ will happen.) This is
certainly not my maximum chance of shattering the board on
any given attempt, though: that was .2% which is one
hundred times less likely than my merely dunking the ball
(twice out of every thousand attempts.) I make two tries,
and as it happens, I dunk it on my second try. Is my
probability that I'm going to shatter the backboard
suddenly increased by the fact that I did this on my second

try rather than my fifth? Is there really a ration of luck which I haven't used up which I can now apply to this? Nonsense! The chance that I can shatter the backboard doesn't change in the least: it's still 1% _once I've dunked_. And it's still .2% before I take the next attempt.

Great Horny-toads! The _London Times_, for pity's sake, wrote that TBW "shows what a convincing scientific argument looks like"!! Are these increasingly flagrant and pernicious abuses of probability theory _really_ that necessary to undergird Mr. Dawkins' argument? And if so, why in the name of Fermi would anyone accept this as a convincing scientific argument??

p 146, "My personal feeling is that, once cumulative selection has got itself properly started, we need to postulate only a relatively small amount of luck in the subsequent evolution of life and intelligence."

Look! It's the Argument from Personal Credulity!

p 146, "This means that we can, if we want to, spend virtually our entire ration of postulable luck in one big throw, in our theory of origin of life on a planet."

My, how convenient. Well, at least it gets him away from the embarassing concept of spreading that ration of luck among multiple stages of mathematical probability. That would have been fun to watch him try, but would have made it less likely that anyone could possibly have accepted the book--or, heck, what do I know? It's not like there's been a _shortage_ of reasons to critically flame TBW.

Ah, nope; he's going to try spreading probability around anyway, except this time within the boundaries of process #1 (organic replicators poof into existence by accident):

p 146, "Therefore we have at our disposal, if we want to use it, odds of 1 in 100 billion billion as an upper limit (or 1 in however many available planets we think there are) to spend in our theory of the origin of life."

And everyone is invited to ignore the fact that this number itself is built entirely on speculation--reasonable speculation, perhaps, but only a guess. The fact that it's a speculation is, in itself, not a bad thing; as long as it isn't used for positive _conclusions_ beyond its purview.

p 147, "At the end of the chapter I shall make the paradoxical point that the theory we are looking for may actually _need_ to seem improbable, even miraculous, to our subjective judgment (because of the way our subjective judgement has been made.)"

That will be interesting; I can think of several reasons why it needs to seem that improbable, not all of which actually help the theory (awe of the sublime comes to mind). Meanwhile, AfGRN again on the game-rigging side.

p 147, "Nevertheless, it is still sensible for us to begin by seeking that theory of the origin of life with the least degree of improbability."

No, the first thing we must do is discuss possibilities and intrinsic impossibilities. Oh, but I forgot; he's already declared by fiat on _that_ score without explicitly alerting the reader. Okay, the first step (after the zeroth step... shhh, don't look behind the curtain there) will be to begin by seeking that theory with the least degree of improbability--assuming we have no other way of determining such things, like a fossil record, since what we actually find in experience would probably have some bearing on our relative estimates of possibility and probability. What's that? We _have_ a fossil record? Then why are we discussing various probabilities of various theories at all at _this_ stage? Answer: in order to _rule out beforehand_ (through misuse of improbability into impossibility) any rival claimants. And of these rival claimants, which one is this process _actually_ targeted against (despite the fact that the target's actual claims have no bearing whatsoever on natural probability estimates)? Does the reader really need multiple guesses?

p 147, "The basic idea of [TBW] is that we don't need to postulate a designer in order to understand life, or anything else in the universe."

Just in case anyone had forgotten.

p 147, "We are here concerned with the _kind_ of solution that must be found, because of the kind of problem we are faced with."

Translation: the kind of problem we're faced with from
that direction, is that we can't actually estimate the
probability of whether a Creator exists and does such-n-
such, or not, through examination of 'normal' behavior
(whatever _that_ really is) of automatic nonpurposive
mechanistic natural material. Therefore, we need a solution
that gets Him into that area of probability, so we can
discount Him by facetiously claiming that any bet better
than Him must be true. Remember: the subtitle of this book
is not "How the evidence of evolution reveals a universe
that _probably_ wasn't designed"! And Paley was
"Gloriously, utterly wrong." So, what kind of solution will
do the trick? Hmmm... I have it! I'll simply assume that a
miracle is _only_ an incredibly unlikely single-step
natural event! Then I can put it up against something which
has more probability. Well, that won't quite get rid of the
possibility that miracles have occured (and still do
occur), but I'll fill the book with tacit switches between
impossibility and improbability, so that will take care of
that. (Voice from Off Behind Left Shoulder: "But wait. If
you redefine miracle like that, aren't you just _starting_
with the necessary presumption that there is no supernature
and no God?") Hush! If I don't do that, I can't get this
conclusion! Don't worry, no one will figure out the switch.

Hey, what can I say? It worked. Ask Michael T. Ghiselin
from the _New York Times_, whose endorsement is inside
TBW's front cover.

The experiment described in the first full paragraph of p
148 is rather cool, and might give us some good ideas about
the mechanics of the process. Of course, the reader is
invited to draw the noticeable parallel here:

"Chemists... have set up in flasks miniature
reconstructions of conditions on the early Earth. They have
passed through the flasks electric sparks simulating
lightning and ultraviolet light, which would have been much
stronger before the Earth had an ozone layer shielding it
from the sun's rays. The results of these experiments have
been exciting."

They illustrate a method by which God could have grown
organic molecules! Oh, wait; it can't be that result,
because (despite the setup of the experiment) the subtitle
of the book is not "How the evidence of evolution reveals
how God may have produced natural life." Sorry; lost my

head for a moment. I forgot we were arbitrarily excluding
God's existence as a necessary prerequisite for filtering
any data we might later examine, thereby convincing people
God doesn't actually exist.

The next few pages, detailing Graham Cairns-Smith's theory
of inorganic mineral development, are pretty good (the
Stonehenge analogy is particularly well-thought.) It is, of
course, amusing that Cairn-Smith's silicate replicators--
upon which 'shape' (in his theory), organic (or carbon-
based) replicating chemical chains could form--are the
sorts of chemicals found in clays and muds. Not that we
should give credit to Genesis or any other creation myth
for this, of course; that was obviously a lucky accident
based on our use of pottery. So, perish the thought that
they had any behind-the-scenes knowledge of that process.
Why should we perish that thought and believe they were
just lucky? Because otherwise those ancient misguided
religions suddenly look a bit more plausib... um... I
mean... no particular reason; just perish the thought.

The reader should also note that we've managed to break the
cumulative-selection barrier--Mr. Dawkins tells us that
these silicate crystals must have been produced as a useful
scaffold by "an earlier form of cumulative-selection." [top
of p 150] Except of course for the "single-step selection"
that started the "cumulative-step selection" that led to
the crystal scaffold--the crystal scaffold as a product of
single-stepping itself is still a shade too improbable for
Mr. Dawkins' taste.

p 153, "At this elementary level, the name 'power' seems
scarcely justified. I use it only bcause of what it can
become in later stages of evolution: the power of a snake's
fang, for instance, to propagate (by its indirect
consequences on snake survival) DNA coding for fangs."

All of which is well and good; provided we don't by trick-
of-language start to apply other concepts of 'power over
its own future' (in the sense of initiated action instead
of reaction) to this analogical way of speaking. In that
sense, the snake's fang is no different from intrinsic DNA
(or silicate crystal) properties like 'stickiness'. Mr.
Dawkins, to his credit, hasn't yet tried to make this
switch; if he does, you can be sure to hear from me on it!

On the other hand, if he doesn't try to make this switch in
some fashion, his own work stands bereaved of its
potential validity. To remind ourselves where we're at in
the clay example, check the following quote:

p 154, "We aren't, of course, suggesting that clays 'want'
to go on existing. Always we are talking only about
incidental consequences, events which follow from
properties that the replicator just happens to have."

I agree on all points here. Now let us put TBW itself into
this paradigm: We aren't, of course, suggesting that Mr.
Dawkins 'wanted' to write this book. Always we are talking
only about incidental consequences, events which follow
from properties that his replicators just happen to have.
Very well then, what grounds do we have for believing that
this book represents reality? It _might_, of course, by
accident; but how can we make an estimation of the
probability or possibility that it does? "Because," starts
the reader; but she can stop right there. At that point we
ourselves are applying to a process other than incidental
physical characteristics of _our_ replicators which
themselves may or may not be true. If we aren't, our own
'becauses' fall to the ground.

Therefore, at some point, Mr. Dawkins must get away from
this sort of clay 'behavior' when it comes to applying to
grounds for his own argument. And offering a merely more
complicated process of the same _kind_ as the clay
'behavior' won't do the trick; any more than a more
complicated betting scheme will overcome a built-in house
gambling edge, as long as we play by that house-edge rule.
Or (since there are still many people who think this is
possible, because they don't understand the actual
implications of probability theories--though I assure you
the casinos do!), offering a more complicated explanation
of _that_ sort won't do the trick any more than an
increasingly more complicated and time-consuming theory
that duration is not an intrinsic characteristic of
reality.

Now, though he hasn't yet (that I immediately recall) tried
to make this switch by inflating the necessarily
metaphorical language of 'power over its own future', when
we're talking about clays and DNA replicators, to the more
literal language of 'power over its own future' which we
use when discussing entities (like ourselves) that we must

assume _do_ have some ability to initiate actions--I say,
though he hasn't tried yet to make this switch to solve the
problem I've just noted, he _might_. And if he does, I will
nail him. If he doesn't? Then we'll check what he _does_
try; but meanwhile, I ask the reader with as much
seriousness as I could ever muster, to be wary of similar
attempts in _other_ people's writings when they defend
philosophical naturalism. Mr. Dawkins may not try it; but
other writers have.

I also ask the reader to note that the functionally
realistic difference between single-step and cumulative-
step selection processes in Mr. Dawkins' clay-damming
example on p 154 is purely in our limited selection of
perception of events. In other words, when we look at a
clay which slows down a flow in such a way that future
deposits of the same clay tend to form to the exclusion of
other clays, this is only a single-step selection event
because _we_ selectively restrict _our_ perception of this
process to one step. Mr. Dawkins, very creatively and
accurately (I think), goes on to illustrate the cumulative-
step process by following a particular chain of possible
results from this event. If he hadn't followed it, would
the damming _really_ have been only a single-step selection
event? Certainly not; results follow from that event, and
they create other results based on those results, and so
on. Mr. Dawkins himself gives me even more evidence for
believing that any attempt to denote one particular event
as a single-step event is at best arbitrary, capable of
being done at any stage one chooses, and thus very easily
used for purposes of game-rigging.

Throughout this book, I've been trying to figure out
exactly why Mr. Dawkins, back in his first few chapters,
set a firewall of single-step/cumulative-step selection
processes where he did. At first, it appeared that it was
to divide organic from inorganic reactions; this is indeed
the thrust of his first few chapters, and he gives no
examples of inorganic cumulative-step processes or organic
single-step processes (you'll remember, though, that I
argued for inorganic cumulative-step processes.) Now he
offers us an hypothesized inorganic cumulative-step
process, and his firewall becomes murkier. The actual
example he gives us here can only lead us, I think, to the
conclusion that any labelling of 'single-step' within a
closed-system set like the nature posited by naturalists,
is one of subjective convenience. One should rather say

that the difference is between replication processes and
non-replication processes; which is a different _type_ of
distinction than whether an event is the result of one step
or a series of steps.

"So what?" the reader may quite plausibly ask. "The
refining of that distinction doesn't seem to hurt his
theory. In fact we can see him implying your 'new'
distinction in places in those chapters." I agree, it
probably doesn't hurt his theory; in fact it seems to work
better once this has been refined and properly clarified.
So, why didn't he _start_ with that instead of a facetious
division of single-step vs. cumulative-step built upon the
bones of the actual division (replicator vs. non-
replicator)? I think that here, in Chapter 6, we see the
answer: he literally begins this chapter by flatly
excluding via presumption the existence of the
supernatural. In essence, he says 'The evidence of
evolution reveals a universe without design because _I_ say
there is no God.' He does this by defining miracle from the
getgo as merely a highly improbable natural event. If he
presented his actual strategy straight out (represented
just previously in my fake quote), his book wouldn't look
quite as impressive. So he disguises his strategy by
defining 'miracle' the way he does (in this chapter--he
does it in other ways in other chapters, stretching back to
chapter one), and not even touching the meaning which
almost all supernaturalists give, and have consistently
given, for it. Now that he's rigged the game, he can
dispose of it by any of various means--and he must still
dispose of it, because no one is supposed to know that he
excluded it completely before the game started. I've
already previously discussed one means by which he tries
this: the misidentification of improbability and
impossibility (set up by him in earlier chapters so the
reader will be comfortable with it by this point.) Closely
related to that, I now see, is the 'single-step' vs.
'cumulative-step' issue. A 'miracle', under his false
definition, would be a single-step natural event (it would
probably be a single-step event in any case, but his
definition of 'miracle' is, before the fact, restricted to
natural events). He can't quite get away even from that--
he's trying to work his way back to a natural single-step
event that's so "probable" that he can strip away enough
awe we might feel contemplating its improbability, that
consequently he can claim this is not a 'miracle'.

But the real work--well, I shouldn't say 'work' for there
was no work involved, merely flagrant presumption--was done
much earlier; like a stage-magician who throws a sheet over
a lady whom he intends to make disappear. Nowadays, they
tend to include little bits of stage acting (the 'woman'
fluttering 'her hands' or flapping the cloth, and the like)
to trick the audience into believing she isn't already
gone. But she is. The same is true here; God was barred
from consideration in the first paragraph of Chapter 6 (and
in one form or another has been disposed of before-the-fact
stretching back before page 10 of TBW), and everything else
afterwards has only been Mr. Dawkins waving his hands over
something that the reader is supposed to believe is still
in the process of being excluded. Occasionally he'll make
the 'God' under the blanket twitch a bit, to give the
impression He's still there. Then--Abracadabra!! Gasp! How
convincing! Applause; Heinemann Prizes! Give that man a
Chair of Public Understanding of Science at Oxford! The
original President of the Oxford University Socratic Club
would have had a field day with this. But he's dead, and
apparently no one's paying much attention on the grounds he
once trod.

Now another purpose for that single-step/cumulative-step
dichotomy occurs to me, with a bearing on how it was
placed. As long as we're talking about replication
processes vs. non-replication processes, we're definitely
in the purely, utterly non-sentient physical; and as I
illustrated above, it's hard to take TBW itself seriously
given _only_ those grounds. Once we start talking about
single-step vs. cumulative-step selection, we can make an
easy transition (a slight category error, but easily
overlooked) to single-step vs. cumulative-step _events_ as
a whole (not just selection processes.) But an action
initiation is quite arguably a single-step event at the
head of a chain of cumulative-step events which follow it.
Ah, but the only entities we actually know of that initiate
such actions are ourselves: organic entities (purely
physical organic entities as far as philosophical
naturalists are concerned.) This would seem to give us some
kind of unique ability in nature a whole; therefore, we
(falsely) position single-step events as counting for
everything to the 'left' of the organic: the inorganic
(Mont Blanc, the solar-system, etc.) No one, except perhaps
some pantheists (whom Mr. Dawkins essentially ignores),
claims that _these_ entities are initiating actions. Thus,
if anyone tries to bring up something like free-will, we

can equate this with a single-step event, and then equate
that with a large body of material events which we have
(earlier and rather facetiously) positioned as 'single-
step' events. Since these (so-called) single-step events
obviously are purely natural and physical events (another
assumption carefully hidden earlier before we get to this
point), we can (falsely) equate the two categories and
claim that free will must also be a natural and physical
event--or better still, that if these events are natural
and physical, we have no reason to wonder whether our free
mental acts are _not_ natural. In order to hide the
arbitrariness of this, we clothe this single-
step/cumulative-step division on the bones of non-
replication/replication events; this necessitates a slight
terminology transfer so that we're discussing single-step
vs. cumulative-step _selection_ (one special kind of
event), but we can bring the other meanings out later. They
don't actually mesh with one another in the way which the
defensive use of this tactic requires, but the differences
are subtle and not likely to be noticed. Voila! A nice
little tripwire, set up very early in advance, to be
brought out later (if necessary) after everyone has
(hopefully) lost track of all the necessary implications.

I don't know yet if Mr. Dawkins is going to do this; I
don't even know that he's set this up intentionally, though
the result will be the same. But I'll be very interested to
see if he tries it. (And if he doesn't, I'll be forearmed
in case someone else _does_ try!)

Now, where was I? Ah, yes; the (otherwise interesting and
highly illustrative) clay evolution story. Except for the
use he's going to make of it, I liked this part of the
chapter more than any other part. What can I say? I like
clever descriptions of process! (Not that this is a big
surprise to the reader, by this point, I trust!) Just so
you don't forget _why_ I brought up the last several huge
paragraphs, let me quote from the end of p 156's first
paragraph, replacing a few nouns here and there:

"Keep holding in mind that there is no suggestion of
'deliberate' engineering, either here or in modern [books
on evolutionary theory.] It is just that the world
automatically tends to become full of those varieties of
[books] that _happen_ to have properties that make them
persist and spread themselves about."

The properties that make these books persist and spread
themselves about need not, of course, include 'a cogent
logical framework actively designed by the author into
which he feeds real facts', nor 'human minds other than the
author who can judge these arguments for their internal
validity with some independence of whether their ultimate
response to the book is environmentally conditioned.' The
properties might only include such things as "a
sufficiently simple and attractive written style to appeal
to the same audience that enjoyed similar early books",
"sidesweeps handed out by the author to a section of
society that an increasing number of people now finds
annoying", "aesthetically beautiful prose which readers
enjoy", "a cadence of impassioned speech which other human
minds can be easily be drawn into today, thanks to prior
environmental and social development", "the ability to
convey a sense of awe in the theory, which humans tend to
find attractive", "lively prose which happens to correspond
to an increasing number of readers' attention-span
limitations", and/or "concepts which an increasing number
of readers now find emotionally acceptable". (The attentive
reader will perhaps already have recognized that I drew
these properties from examples given by the jacket-blurb
exaltations of TBW--using synonymous phrasing to illustrate
in a technical way what the implications of their praises
actually mean.) Therefore, Mr. Dawkins will eventually have
to produce some cogent reasons why reason can develop from
non-reason. This is not the same as asking him to produce
cogent reasons _that_ reason exists. That would be unfair,
since it's logically impossible to prove reason exists. Our
ability to reason can only be assumed; any theory we work
out afterward needs to show that it doesn't exclude it, but
it doesn't need to _prove_ we can reason. Of course, should
his 'explanation' boil down to anything I've mentioned
above, or even an argument that argument is _possible_,
then he's toast. If not, he's toast again, for the property
of nonintentionality gets transferred right up the line
from those clays and early DNA replicators to his own
theory (as he illustrated with the beavers.)

The clay-arch theory, though, is extremely interesting and
(aside from its eventually faulty use) very well-put.
There's a bit of potential misunderstanding, though, that
should be cleared up mid-p 157:

"Originally a side-show, the new replicators turned out to
be so much more efficient than the original crystals that

they took over... the original mineral replicators were cast aside like worn-out scaffolding."

I don't think this is the proper way to put this; it implies that the 'old' way of doing things stopped when the 'new' one got going. In fully biological life, the new mutation may be so successful that it usurps enough of a limited amount of necessary resources in its biosphere that 'older' competing species either die out or move to new biospheres. This probably isn't the case for replicating silicoids; if they're gone now, or in forms entirely different from what we'd expect to help form DNA replicators, then its because of environmental changes and/or the silicon-replicators' own ongoing cumulative-step process of 'development'.

On pp 157-158, Mr. Dawkins introduces the concept of "memes", which are patterns of information that might behave like replicators; and the spread and development of which we call "cultural evolution". Please note that this sort of cultral evolution has no more intrinsic link to action (instead of pure reaction) than the social evolution of social animals. It's more efficient, because of the means by which it is spread: sound waves which set off more highly complicated reactions in human brain-matter, for instance, than we'd find in the brain-matter of wolves, for instance. This is what a 'complex language' vs. a 'simple language' would mean in purely physical terms. The question of whether any bit of communication on the part of one of these entities (e.g., Mr. Dawkins' own TBW) is 'true' or 'cogent' is a completely different question, which this process doesn't touch yet and provides no explanation for, in and of itself.

"But," says the reader, "true information is more likely to be useful; therefore more likely to be replicated. Thus over time, we may expect that communications will 'develop' that reflect reality better and better." Perhaps; but notice what you're doing. At best, this argument (as an _argument_) is highly circular; at worst, self-contradicting nonsense.

If you've made this argument, then either your confidence in your own ability to reason is in question, or your confidence in the ability of what only _appears_ to be reason to deliver (or qualify) potentially true mental impressions of reality is in question. (I don't necessarily

mean you have a psychological state of questioning your
confidence, though you might; I mean this as a formal logic
proposition.) And in either case, you are using an
inference (that is, an act of 'reasoning') to reestablish
your confidence. If you were questioning the second
contention, then you have tacitly abandoned the distinction
between reason and non-reason altogether, and the best you
can say is that your ability verifies your ability's
ability to verify your ability's ability's ability to...
(etc., forever.) You are applying an ability (or, rather,
the ability is applying itself) which produces reassurance,
and what it is reassuring is that its reassurances are
valid, which is the entire question. This is probably not a
procedure a sceptical reader would accept from a Christian
who is attempting to justify the Bible (or a Muslim who is
attempting to justify the Koran) as an inspired book by
pointing to where it says "This is an inspired book"! I
presume that the sceptical adult reader quite understands
the circularity of this, even assuming that either book is
in fact inspired. Then why accept it when applied to a
similar explanation of your own reasoning?

On the other hand, if you are wondering whether a given
explanation asserts at bottom that your ability to reason
is an illusion, you cannot draw inferences (i.e., reason)
to provide effective reassurance about this. You cannot
logically justify the ability to reason by reasoning. An
argument that arguments are possible is just as nonsensical
as an argument that arguments are _impossible_. It is
possible and cogent to write a paper showing that friction
or duration exists, because you are not actually relying
primarily on friction or duration to illustrate this.
Even if you plastered yourself with velcro and hung on a
wall, you aren't using _only_ friction to prove (or even
just illustrate) friction exists; you are also, and
primarily, using _reason_ (and assuming that your audience
is doing the same thing)--otherwise your demonstration in
support of the friction thesis is not really a
demonstration _in support_ of it. But reason itself cannot
be treated the same way.

I do not mean, by the way, that I, for instance, am 'only
using reason' to make this argument. I am also using a
number of biochemical and biophysical effects, which are
functionally similar to extrabodily tools such as the
computer. But these effects are neither the primary causes
nor the primary grounds for my argument; if they were, then

their blind, non-purposive nature would certainly be used against my argument--e.g., I'm _only_ saying this _because_ I have a deeply ingrained psychological complex which produces my behavior. Indeed, many psychologists (though perhaps fewer now than in years past) would be quite insistent on this, upon learning I am a Christian (my belief in Christianity being a sure sign of a clinical wish-fulfillment delusion, for instance.) And it _could_ be true, in my individual case. It _is_ possible that my own individual efforts in this book are the product of what is, at bottom, a purely nonrational set of causes. Perhaps I have a brain tumor; perhaps I am clinically paranoid; perhaps I am so psychologically conditioned by my environment (in this case my upbringing in a Baptist church by Baptist parents in a largely Baptist community) that I am incapable of interpreting the world another way. In the same fashion (paraphrasing a Robin Williams comedy routine), my insistence that there is a snake in the hole of a golfcourse's green could be primarily a biophysical result of cocaine affecting my brain. I might even be correct; but it would be by accident, and everyone would still be justified afterwards for not believing me. Any of these things _could_ be true about me as an individual-- provided, of course, that my beliefs _are_ entirely, or primarily, produced by ultimately non-rational chemical/physical reactions. It can certainly be hard to determine, or to rule out, in the case of an individual. (For instance, I once actually _did_ put a snake in the hole of a green. If I had claimed a few minutes later that there was a snake in the hole, someone who didn't know this might make any number of guesses as to the cause of my statement--but any reductive explanation would be incorrect.) But there is one thing we can (or at least should) be sure of: this cannot be the case for _every single_ human being. If the psychologists' theory about my environmentally produced belief (used by them against my arguments) were the universal condition of all mankind, their own theory (which would _also_ necessarily derive completely from similar non-rational effects) would immediately be cut from under them.

I admit, of course, that you may claim, if you like, that non-rational events (and _only_ non-rational events) produce rational events; but then you must eventually get reason back into the equation somewhere without making it functionally _equal to_ the nonrational--for if it is only the nonrational under a different name, or looked at from a

different angle, then it is still nonrational. And after
that, any argument based upon it will be self-destructive.
There are many different ways, mathematically, to write
x=6. Some are very simple (like 2x=12), some can be mind-
bogglingly complicated. But they all still end with x
equalling 6--otherwise you have changed the equation by
adding something above and beyond the systemic unity of the
equation, and you will have a result which will not
function like a 6, precisely because it is _not_, any
longer, a 6. This doesn't overturn the intrinsic 'laws'
(or, perhaps we should say, the 'necessary relations') of
mathematics; they still apply. In fact, it is because they
_do_ still apply that if, after hypercomplicating an
equation, we simplify it again and discover x equals
something else, we can therefore be absolutely sure that we
have (perhaps unintentionally) introduced an element into
the equation that the original equation could never have
exhibited intrinsically. For that matter, because the
'laws' of math still apply, we can even be sure that this
new situation (where x=6 becomes, say, x=16) is not
derivable within the original systemic unity of the
equation.

But this is the problem which naturalists set for
themselves; if they leave x=6, then the properties of '6'
(analogically speaking) undercut their own claims that
their argument is not 'merely' a physical reaction, by
which they commonly (and quite sensibly) refute some other
positions. So x must eventually equal 16, which represents
a state wherein their own arguments might (or, hopefully,
are) rational--where you and I, instead of light or sound
merely striking some nerves and causing reactions which
lead us to behave 'in sync' with the naturalists (whether
their own reactions reflect reality accurately or not), can
instead say, "Yes, I see. Your facts are accurate, your
logic is sound. If we take our own rationality seriously
and honestly, we must admit that you are probably or
certainly correct." After all, Mr. Dawkins (along with
practically every other naturalist) certainly _seems_ to be
presenting an argument which he thinks we are obligated, in
some sense, to accept; not one which merely causes an
irrational reaction within us. In fact, it looks very much
like we are _morally_ obligated to accept a cogent
argument, provided we actually work it out for ourselves
and thus perceive its cogency. To refuse it after
'understanding' its internal validity is to turn our heads
from something we deep down know to be true; to refuse

reality; to be dishonest. We 'should not' refuse this, though we can.

There is even a hint (perhaps more than a hint) of moral outrage from Mr. Dawkins concerning people's unwillingness to accept naturalistic evolutionism, stretching as far back as his own introduction to the 1996 edition of TBW. "There are still those who seek to deny the truth of evolution, and there are disturbing signs that their influence is even growing." [p x] These people are described as "propagandists" [p xi], and Mr. Dawkins' opinion of what he perceives as their chief methodology certainly _seems_ to be going beyond purely clinical observation:

p xi, "In most cases, they know deep down what to believe because their parents recommended an ancient book that tells them what to believe. If the scientific evidence learned in adulthood contradicts the book, there must be something wrong with the scientific evidence. Since all radiometric dating methods agree that the earth is thousands of millions of years old, something obviously has to be wrong with all radiometric dating methods. The holy book of childhood cannot be, _must_ not be, wrong. There are grounds for hope, however." [italics his]

Mr. Dawkins describes a set of people who base a belief on Reason A (and, he strongly implies, not that great a reason); who when exposed to 'better' lines of reasoning in their adulthood refuse to accept the conclusions of these reasonings and stick to the conclusion of Reason A. Does he perhaps excuse these people because the better lines of reasoning are terribly complicated and so they might honestly misunderstand the arguments? No; apparently these reasons are accessible enough that this is not a mitigating circumstance (it "takes only minutes", according to him on the same page, to present the ideas in such a manner that an honest person can accept their internal cogency and make a truth-judgement thereby). Does he cut them some slack because they are, after all, showing loyalty to a group and a Person (even if he himself happens to know this Person doesn't exist)? No, that never comes up. Does he suggest that they should not be looked down upon or held accountable because, after all, they are merely reacting to socio-environmental pressures? No, this issue is not raised either; on the contrary, he writes as if they could have and _should_ have accepted the "scientific evidence".

Well then, does he merely assert this situation in a
clinically sociological fashion? If I can trust my own
ability to 'read with understanding' (as my English teacher
liked to say), I see a good deal of indignation about this;
and not just personal indignation, but a genuinely moral
indignation. He goes on to describe how he was invited on a
radio tour, and how he had been looking forward to
"destroying" the arguments of these people should they
oppose him; yet discovered that in many cases there was
simply no knowledge of the lines of reasoning he was
defending. He sees an _altogether_ lack of knowledge as a
mitigating circumstance, and he was quite glad to explain
his position to them ("what happened was even better") and
was pleased by the positive results--not just personally,
but because such an advance is apparently an objectively,
morally good thing. ("There are grounds for hope".) He ends
the introduction with an anecdote describing his
satisfaction when a "simple, young creationist" student,
who presumably had never been exposed to cogent and fair
explanations of these ideas, attended one of his Oxford
lectures and afterwards "beamed with the primal joy of
discovery." (And, in passing, he notes that this fellow had
been "admitted to the Zoology Department at Oxford
University... through some accident of the selection
procedure". No reasons are given for this, though Mr.
Dawkins' surrounding sentence structure invites the reader
to imply that the student's creationism should have been
held over and against any other skill or facility he may
have had in Zoology.)

What I'm trying to illustrate here, is that even Mr.
Dawkins appears to apply to the concept that a logically
cogent argument with good facts _should_ be accepted, and
that it _can_ be refused despite its cogency; and that the
reader can (and/or should) agree with this concept. But
this implies that, in reasoning, we have some kind of
ability in addition to nonrational reaction and
counterreaction, which would otherwise fully account for
our behavior. Along with numerous other examples of this
sort which I've already described in TBW, Mr. Dawkins
necessarily requires that (in terms of my recent
mathematical metaphor) x=16. But in molecular chemistry,
and apparently in sub-human biology, x=6. If the forumla is
a closed system, no matter how hypercomplicated it gets,
then x can never equal anything but 6. If it is _not_ a
closed system? Then one way or another the naturalistic
argument is struck a critical blow which simultaneously

affirms the qualities of its principle rivals: there is
more than one level to reality (a supernature exists),
reality is basically sentient (God exists), or both. The
alternative is to try to beat the math: to affirm that x=6
at one point and also that x=16 at another point, without
making a fundamentally qualitative change in the original
equation--or, if such a change must be made, to demonstrate
that it can be made by purely applying to the properties of
the idea that x=6 (and its hypercomplicatives). Either one
of these options requires eventually that we accept the
proposition that 6=16.

In case anyone suspects me of being facetious, let me
remind the reader that I've already demonstrated that Mr.
Dawkins repeatedly applies to the concept that something
really is what it claims to be, yet really is something
else clearly distinguishable from it in concept. He seems
quite at home with applying the principle of 6=16 to help
his arguments, and expects us to agree with him that this
is cogent! More subtly, I think several of Mr. Dawkins'
remarks necessarily presume that humans are not thoroughly
natural creatures (e.g., he doesn't cut the New Zealand
ranchers any slack for displacing the thylacids, despite
the fact that according to 99% of the argumentation in TBW
the ranchers must be perceived as simply replicating
themselves more efficiently by necessarily removing a
competitor to the resources the ranchers bring with them
into the biosphere: sheep, cattle, etc.) The options I've
just described in the last paragraph are not ridiculous
simplifications of naturalistic arguments; they are main
tools of Mr. Dawkins' naturalistic arguments. I do not say
that _all_ naturalists use these tools (I haven't read
every naturalistic argument.) I'm saying that Mr. Dawkins
does; that they're utterly invalid; and that they will
necessarily sink any other arguer who applies them. If
naturalism _cannot_ be argued without applying to these
precepts (and/or _cannot_ be argued without circularity and
beggings of the question), then the philosophy of
naturalism should be rejected; and we should be looking at
the consequences of that rejection.

We could still keep, of course, the _science_ of biological
evolution, provided it doesn't rest on the bedrock of these
faulty procedures itself. Even if it did rely on these
tactics--which I think it does not--we might still be able
to rescusitate it using better logical procedures. The
point is that taking out the philosophy does not

necessarily change the science. Architectural engineering didn't falter or fail, and wasn't abandonded, during and after the Enlightenment, even though fewer cathedrals were made with it. Fewer cathedrals were made because people-- notably heads of state who helped pay for them--were abandoning Christianity during the Enlightenment. Architectural principles weren't bothered by this at all, despite the fact that a great many of those principles had been developed by Christian thinkers in service of the Christian religion to build cathedrals. Architectural principles went right on being applied; in some cases, in service to new philosophies (e.g., Mr. Dawkins' application of arch-construction principles in this chapter.) In the same vein, though the ancient Middle-Eastern, Middle/South American, and Gaelic polytheisms have been largely, or totally, abandoned, we still go right on calculating eclipses, star positions, and seasons.

Returning (finally!) to TBW itself:

p 158, "Could it be that one far-off day intelligent computers will speculate about their own lost origins? Will one of them tumble to the heretical truth that they have sprung from a remote, earlier form of life, rooted in organic, carbon chemistry, rather than the silicon-based electronic principles of their own bodies? [etc.]"

Could happen. Will a robotic counterpart to Mr. Dawkins write a book arguing that these earlier forms of life were completely non-rational and that robots' own rationality thus springs from the completely nonrational? Seems just as likely; though not particularly flattering to Mr. Dawkins' own book! Will this robotic sage be correct on this point? Obviously not. Does Mr. Dawkins' imaginary situation _really_ help illustrate the potential validity of his own position? Seems to me he'd've been better off not inviting the comparison! I myself expect to be extremely amused if any of this happens.

p 159, "[But] let's look more deeply into this matter of miracles and improbability."

By all means, let's! Rats; check that. More AfGRN coming up.

p 159, "By doing so, I shall demonstrate a point which is paradoxical but all the more interesting for that."

We've certainly seen enough paradoxes up to this point; though I hope by now the reader won't be inclined to take the announcement of the approach of yet another paradox as something to cheer about.

p 159, "This is that we should, as scientists, be even a little worried if the origin of life did _not_ seem miraculous to our human consciousness. An apparently (to ordinary human consciousness) miraculous theory is _exactly_ the kind of theory we should be looking for in this particular matter of the origin of life."

Well, this actually _is_ a pleasant surprise; he meant 'paradox' by its classical defintion (it only _seems_ a contradiction in terms), not by its often modernized definition (it actually _is_ a contradiction in terms.) Given his methodological track record to this point, I can hardly be blamed for being a bit suspicious of the advent of yet another layer of nonsensical argumentation.

p 159, "So, what do we mean by a miracle? A miracle is something that happens, but which is exceedingly surprising."

I certainly won't deny that, but if that's the only specific qualification he intends (i.e., a miracle is _only_ an exceedingly surprising event), then we're back to the AfGRN, this time in a crushingly trivial sense (though certainly useful for his purposes.) In fact, his next two paragraphs are one long extension of the AfGRN, wherein he flat _assumes_ that miracles are only statistically improbable natural events, and then proceeds thereby to try convincing the reader that the natural order doesn't exhibit or require supernatural miracles. For example:

p 159, "The only thing miraculous about my hypothetical story is the _coincidence_ of my being struck by lightning and my verbal invocation of the disaster." [italics his]

Big buttery chunks of AfGRN. He'd've been in exactly the same position had he just stated: 'There's no such thing as supernatural miracles, and we don't need them', and stopped there. Of course, that wouldn't look quite like an _argument_. For what it's worth, if the reader is considering drawing any conclusions from the fact that Mr. Dawkins asks to be struck by lightning and it didn't

happen, remember that this 'conclusion' could be answered
on its own flippant level with the retort that, if
Christianity--and most other theisms--are true, he's likely
to get something worse than a lightning bolt later. Smoking
a cigarette and living to tell the tale does not, by
itself, make up any kind of useful argument that cigarettes
don't cause cancer. Not that Mr. Dawkins explicitly tries
this 'argument'; but the way he writes it leaves it open
for implication.

p 159, "Coincidence means multiplied improbability."

So, if you win the lottery once, it must not be a
"coincidence"; you'd have to win it twice.

p 159, "If a coincidence of this magnitude happened to me
[i.e., being struck by lightning during the same minute he
asked for it], I should call it a miracle and would watch
my language in the future."

Here's something amusing to consider: Mr. Dawkins directly
implies that, should he be struck by lightning the minute
he asked for it, he would consider an event of this
probability (one chance in 250 trillion by his estimate) as
evidence strong enough to convince him to bet that
something other than purely automatic natural process is at
work (otherwise I suppose he'd merely 'marvel' at the
coincidence; instead he says he'd "watch my language in the
future".) One chance in 250 trillion sounds like an
extremely low probability--and it is! But let's take a look
at relative probabilities, shall we? One trillion equals a
1 with 12 zeroes after it. 250 trillion equals a 2 with 14
zeroes after it (the first of those zeroes being a 5, or
2.5x10E14). So we're talking about a number with a
probability factor of E14. Since we're talking about
probability _against_ (i.e., one chance in 250 trillion
for, which is like 250 trillion against), then the higher
that number after the E, the _less_ probable the result.

Now, here's the kicker: go back and check Mr. Dawkins'
estimates of probability (as far as he's given them for
'comparative' purposes) for naturally occurring, undirected
cumulative-step evolutionary development. The very _best_
probability estimate which I recall Mr. Dawkins linking to
his theory runs to about one chance in 10E20. (I qualify
myself with this, because as I've pointed out before--and
will do so again--even _this_ probability represents

unrealistically favorable terms.) In other words, however
much better the odds for gradual undirected evolution are
compared to a single-step event (and completely setting
aside the thoroughly faulty use Mr. Dawkins makes of this
concept in trying to argue against supernatural events),
the probability of the cumulative-step selection event
which Mr. Dawkins defends is actually several orders of
magnitude _LESS PROBABLE_ than an event which he would
consider good evidence for supernatural activity! _By his
own standard of judgement_ we should be betting on a
supernaturalistic (and not a naturalistic) explanation even
for a gradualistic developmental process!

Fortunately, his application of probability-estimates to
the question of supernaturalism is thoroughly illegitimate-
-so naturalists can breathe a sigh of relief. Sort of.

p 160, "The conclusion to this part of the argument is that
we can _calculate_ our way into regions of miraculous
improbability far greater than we can _imagine_ as
plausible." [italics his]

AfGRN. Quick, reader, how do _you_ "imagine" $1:2.5 \times 10E14$
odds? A little tough? Is it really any tougher to imagine
$1:1 \times 10E190$ odds? No, they're both quite unimaginable. That
second number sure _looks_ more formidable, though--it has
190 zeroes after it instead of 14. Let's be sure to exclude
it as a possibility. Oh, and let's ignore the question of
whether there's something affecting the universe other than
quantifiably probable effects. How can we be sure that the
bigger odds didn't happen? Actually we can't, though it's
(somewhat) safer to bet they didn't. Do the bigger odds
even represent supernatural creation? Not in the least, so
excluding them in hindsight (even if that's possible)
doesn't touch the question.

p 160, "What we can imagine as plausible is a narrow band
in the middle of a much broader spectrum of what is
actually possible. Sometimes it is narrower than what is
actually there."

True on both counts. In fact, what _is_ probable (not
merely what we can imagine as plausible, which is fairly
subjective) is a "narrow band", etc. And it is indeed
sometimes narrower than what is actually there. But that
presumes we can determine what is actually here from other
means, not from studying the probability. If we actually

don't have a Tennessee State Lottery, then no one is
going to convince me that my brother, Spencer, won it by
maximizing his chances buying a million tickets. For that
matter, no one is going to convince me it's possible he won
it despite the fact he bought only one ticket. Heck, no
one's even going to convince me he won it if he actually
dumps $365 million on my front lawn. He can't have won it
because _WE HAVE NO STATE LOTTERY_! It is, of course,
certainly indisputable that the money is piled on my lawn
to a uniform depth of about 4 $100 bills across an area 300
feet on a side (once I rake it smooth!), but he couldn't
have gotten it from _that_ lottery. Of coures, if Spencer
dumps that much money on the lawn and then states he won it
in the Tennessee lottery, I might be inclined to second-
guess myself about its existence. But merely looking at the
money or calculating the odds of his winning it (under any
circumstances) won't help argue for its existence. Or for
its non-existence. He could have gotten the money from
another lottery; he could have robbed a federal reserve; it
could be fake money; the King of the United States might
have given it to him; I might be dreaming. None of these
options (including that he's telling the truth and there
really is a Tennessee State Lottery) are capable of being
probabilistically described, at least as far as actual math
goes.

For example, if I have a low estimate of The Bro's mental
acuity, I might subsequently estimate the chances he robbed
a federal reserve as "not bloody likely." But that's hardly
a rigorous mathematical statement about the actual
probability. On the other hand, I might be able to rule out
some options' _possibility_; for example, I could run some
tests which indicate I'm not dreaming (this assumes that I
have the ability of distinguishing a dream-state while
dreaming, but as it happens I can do this--I had to learn
to do it to overcome chronic childhood nightmares.) Or I
might check the political structure of our country and come
away reasonably certain that we don't have a King
(therefore, he couldn't have gotten the money from a King.)

Now let's change the example to say Spencer is actually
claiming that the King of the United States gave him the
money (though he does not deny that there is a Tennessee
State Lottery). Let us continue by changing the allegory to
say that I believe there is no King, and indeed no United
States. I'm a good Confederate and we've never had a king
(or even a king-like president) because it's unbecoming to

a confederacy of states--the confederacy itself is run, in
this case, by economic market pressures, which 'decide'
(metaphorically speaking) individual state policy and what
happens to us individuals. (This doesn't represent my
actual political opinions or theories, by the way; it's
just a handy allegory.) I actually think he got that money
by the Tennessee State Lottery, a roughly mechanical
process of chance. For purposes of this allegory, let us
even say I happen to be correct; my brother is delusional
or simply vastly mistaken. In this allegory, the King (of
course) represents God, the United States could represent
heaven if you wish (or the generally supernatural level of
reality), the money represents Spencer's existence and
ability to reason, the Tennessee State Lottery represents
the nonrational forces of purely physical nature (and so
might the confederation's bureaucracy). Again, for purposes
of the allegory, I'm going to set aside all my previously
mentioned problems concerning the logic of the naturalistic
philosophy; I'm assuming that it's actually logically
cogent that Spencer got his 'money' from the 'Tennessee
State Lottery'. Now, how should I convince _him_ of this?

I start by telling him that there is no King, and no United
States which encompasses our confederacy of states. I don't
bother offering any evidence or even abstract analysis to
show there is no King and no United States; so am I
helping him and giving him a fair chance to believe me? I
continue by illustrating that there is a Tennessee State
Lottery; I can do that fairly well because there are signs
of it everywhere, and even Spencer agrees it exists.
Obviously, I say, Spencer got the money from the Lottery.
It can (in my allegory) provide him with the money; we need
not apply to a King for an explanation. So far, so good;
but I'm bothered because I really haven't _actually_ dealt
with the King issue, yet. So how should I proceed? Would it
be wise or sensible for me to proceed by redefining the
King as another Lottery (a Confederate Lottery, for of
course there is no United States)? And then demonstrating
that as improbable as it may be that he won the Tennessee
State Lottery, it's extremely more improbable for him to
have won the Confederacy Lottery? Would Spencer be acting
sensibly if he, _on these grounds_, abandoned his belief in
a King--even if he hasn't met this King himself and _only_
believes that he exists and awards money because of a
report by people thousands of years dead who claimed to
have met him (or at least to have met _a_ King?) It would
certainly be no particular fault of Spencer's if he didn't

catch my switches in categories: I presumed as a necessary
preliminary to my argument that there is no King to give
the money, and I hid this by trying to make the concept of
the King equal to a bigger Lottery. If he perceives this,
though, _should_ he accept my explanation?

And this allegory is actually carried out under extremely
favorable terms for the Lottery-no-King advocate. It
assumes that a Lottery is actually capable of providing all
the money (i.e., nonrational nature is actually capable of
providing all human characteristics, like our ability to
reason and a moral sense which allows Mr. Dawkins to be
correct in judging the ranchers wrong for exterminating the
thalycids.) It assumes that the question of Who Set Up the
agreed-to-exist Tennessee Lottery is a nonissue (despite
the fact I'm trying to convince my brother that there is no
Who to set it up). It assumes that even if a King existed,
he couldn't bequeath the money without a Lottery, or even
that he couldn't use the Lottery to award the money.

The point I want to make with this is that _even if Mr.
Dawkins is correct_, his general methodology does not allow
a valid logical train to lead to his conclusions. In other
places, piecemeal, I'm also arguing that Mr. Dawkins _has_
to use this sort of methodology because otherwise his
position would be perceptively unsupportable; but that's a
contention beyond the scope of this allegory. Back to the
book:

p 161, "The odds against [each of four bridge players
receiving a complete suit of cards] are
2,235,197,406,895,366,301,559,999 to 1. Let us call this
one dealion, the unit of improbability. If something with
an improbability of one dealion was predicted and then
happened, we should diagnose a miracle unless, which is
more probable, we suspected fraud."

Numerous AfGRN points here. One thing to be fair about,
though: Mr. Dawkins does (finally) appear to be dealing
with point b. of the AfGRN (though that didn't stop him
from functionally equating impossibility with improbability
at earlier stages in the book.) But let's check what he's
actually doing here.

a.) "If something with an improbability of one dealion was
predicted and then happened...", he writes. But we're at
the 'happened' part already. The question of probability is

almost a moot point, only to be referred back to if _all
else fails_, and then sufficiently qualified. We are not at
the state of saying, "I predict that my brother _will win_
the lottery". He claims to have _already won_ it. He's got
the money. The _last_ thing I should recourse to is the
probability of his winning the money--'well, that's too
improbable, so I'd better discount it as a possibility.'
But instead, as we've seen, the issue of probability is
practically the _first_ issue Mr. Dawkins recourses to; and
even then, I argue, he does it in numerous illegitimate
ways.

b.) How does Mr. Dawkins know that fraud is more probable
than miracle? He can't except by arbitrarily defining
miracle as (effectively) the most improbable of natural
events; which utterly discards the actual contention of
most creationistic theists without dealing with the issue.

c.) And the issue is, precisely, that theists believe
miracles are supernatural _interventions_ into a system.
Miracles _are_ tampering with the system; just as much as
'fraud', if you like to call it that, though without the
ethical overtones. I have already touched on this in
numerous examples myself, so I'll refer the reader back to
them and move on.

Oh, and did I say that Mr. Dawkins appeared to be finally
extricating himself from shuffling possibility, probability
and certainty? Sorry, my mistake:

p 161, "On the spectrum of improbabilities, the spotlight
turns out to illuminate **only** the narrow range from the
left-hand end (certainty) up to minor miracles, like a
hole-in-one or a dream that comes true." [italics mine]

And the AfGRN is back in full force.

p 162, "We are equipped to make mental calculations of risk
and odds, within the range of improbabilities that would be
useful in human life."

I agree with this. I even agree with this if he were to
change the sentence to read "equipped to experience
workably accurate mental impressions of risk and odds"; I
do not consider the two events the same thing. In the same
way, I am equipped to _learn how_ to fence (because I have
a physical organ--the brain--with which I can recognize and

sort tactics and strategies), and I am equipped _to_ fence
(because I have two legs, two arms, and a body not entirely
unsuitable to strenuous anaerobic exercise of that sort).
I'm not exactly equipped with a sword, but I can get one!
(And I'm probably equipped to learn how to make swords, as
well as to actually make them.) All of this is fine; but it
rather leaves the question open of _why_ I fence, or even
whether I fence. Do I fence because a vast host of
nonrational effects combine together to result in that
event, or is there some rational action from myself in
there somewhere? And if so, how did I get _that_ ability?

p 162, "We should make a habit [if we lived for a million
years] of not crossing roads, for instance, for if you
crossed a road every day for half a million years you would
undoubtedly be run over." [italics mine]

AfGRN.

p 162, "But even [creatures that live a million centuries]
will blench if a marble statue waves at them, for you would
have to live dealions of years longer than even they do to
see a miracle of this magnitude."

AfGRN. And the whole paragraph with which this sentence
ends, by the way, is another example of flat-out assertions
involving "evolution equipping our brains with a subjective
consciousness of risk and improbability" and "natural
selection has therefore equipped our brains to assess
probabilities".

p 162, "Well, we began this argument by agreeing that
Cairns-Smith's theory, and the primeval-soup theory, sound
a bit far-fetched and improbable to us. We naturally feel
inclined to reject these theories for that reason. But
'we', remember, are beings whose brains are equipped with a
spotlight of comprehensible risk that is a pencil-thin beam
illuminating the far left-hand end of the mathematical
continuum of calculable risks. Our subjective judgement of
what seems like a good bet is irrelevant to what is
actually a good bet."

I'd like the reader to remember that my remarks on the
Cairns-Smith's clay-theory _itself_ (considered as a
biological theory) were positive and appreciative; and also
that my criticisms of how Mr. Dawkins used it were _not_
based on probability estimates or on a general sense of

'this is far-fetched'. However, as long as he's bringing it up, it is Mr. Dawkins himself who wishes us to reject a theory based on its relative improbability. 'But,' Mr. Dawkins might say, 'it's more reasonable to bet on the relatively more probable theory over the less probable theory because in _this_ case we can objectively judge it not subjectively assess it.' Really? How did that ability to _objectively_ assess probability estimates creep in? Let's go back and check what he's actually written on this (I encourage you to check the book yourself to make sure I'm not leaving something out):

p 162, "Our brains have been built by natural selection to assess probability and risk."

What kind of assessments?

"...within the range of improbabilities that would be useful in human life."

Useful how?

"This means risks on the order of, say, being gored by a buffalo if we shoot an arrow at it, being struck by lightning if we shelter under a lone tree in a thunderstorm, or drowning if we try to swim across a river."

In other words, risks commensurate with our ability to efficiently replicate. Do you, the reader, get the impression that Mr. Dawkins' estimates of the relative probabilities of two sorts of spontaneous natural generation fall in _that_ category? We're obviously dealing with something else now. But what did evolution equip Mr. Dawkins with?

"Evolution has equipped our brains with a **subjective** consciousness of risk and improbability suitable for creatures with a lifetime of less than one century... [italics mine] [N]atural selection has therefore equipped our brains to assess probabilities against a background of the short lifetime that we can, in any case, expect."

Okay, so under what conditions might we find that subjective assessment to transform into some kind of objective assessment?

"If on some planet there are beings with a lifetime of a million centuries, their spotlight of comprehensible risk will extend that much farther towards the right-hand end of the continuum."

And is _this_ condition an _objective_ assessment? No:

"The **subjective** judgement of an alien with a lifetime of a million centuries will be quite different." [italics mine]

Because it's now objective? No:

"He will judge as quite plausible an event... which we, kitted up by evolution to move in a world of a few decades' duration, would judge to be an astounding miracle."

AfGRN, by the way. So we've got 'us' as a species (and 'us' includes Mr. Dawkins, I presume), and 'the aliens' as a species; both of us wired up to _subjectively_ assess probability in similar _fashions_ but with different _ranges_. Can we trust that _subjective_ consciousness to help us in this abstract estimation before us? No:

"Our **subjective** judgement of what seems like a good bet is **irrelevant to what is actually a good bet.**" [italics mine]

Mr. Dawkins goes on to ask, "How can we decide whose point of view is the right one, ours or the long-lived alien's?"

Well, gosh, _both_ points of view are presented as _subjective_; and by Mr. Dawkins' own testimony, his own _subjective_ judgement of what _seems_ like a good bet is irrelevant to what is actually a good bet.

Notwithstanding this, "There is a simple answer to this question. The long-lived alien's point of view is the right one for looking at the plausibility of a theory like Cairns-Smith's or the primeval-soup theory."

Therefore, Mr. Dawkins himself can apparently objectively judge subjective estimates of probability; which means he can himself objectively judge probability estimates and say 'This subjective assessment is the proper one to use'. WHERE WAS THIS ABILITY IN HIS EXAMPLE?? Each of those sentences was taken from the same page, p 162. If the

reader will check, you'll see I left nothing out where this objective ability was hiding. Mr. Dawkins "simply", and secretly, _ASSUMES_ it; while simultaneously explaining that evolution provides us with _subjective_ impressions of probability for limited non-abstract use related to our ability to survive.

There is a giant hole here; one that screams 'Supernatural!'

p 163, "For our decade-conscious brains, an event that happens only once per aeon is so rare as to seem a major miracle. For the long-lived alien, it will seem less of a miracle than a golf hole-in-one seems to us..."

AfGRN; and, apparently, Mr. Dawkins doesn't have a decade-conscious brain. He can form the distinction that what _only seems_ a miracle is not a miracle.

p 163, "Our own subjective judgement about the plausibility of a theory of the origin of life is likely to be wrong by a factor of a hundred million."

Mr. Dawkins' objective judgement, on the other hand, is more reliable; despite the fact that he hasn't accounted for its existence.

p 163, "Our brains are probably equipped by nature to assess the risks of things happening to ourselves, or to a few hundred people in the small circle of villages within drum-range that our tribal ancestors could expect to hear news about."

Anyone think this is what Mr. Dawkins himself is applying to, when _he_ estimates probability of abstract theories? No? Me neither.

He continues not applying the sorts of assessment which _nature_ equipped his brain with on the following page, while discussing how we should assess the improbability of something like the Cairns-Smith theory against three different "benchmark views about the uniqueness of life". Here are the three benchmark views [p 164, italics are mine]:

"1. Life **has arisen** in only one planet in the entire universe (and that planet, as we saw earlier, then has to be Earth)."

Earlier on the page this was phrased as, "**Probability** of life on a randomly selected planet if life arose only once in the universe." As we can see, Mr. Dawkins still shows little compunction about shuffling certainty with probability.

"2. Life **has arisen** on about one planet per galaxy (in our galaxy, Earth is the lucky planet)."

Earlier on the page this was phrased as, "**Probability** of life arising on a planet if life arises at a rate of about once per galaxy." Again, no compunction about shuffling terms of certainty with probability.

"3. The origin of life is a sufficiently probable event that it tends to arise about once per solar system (in our solar system Earth is the lucky planet)."

To his credit, this is phrased properly earlier on the page as "Probability of..."; but that didn't stop him from rephrasing the other two, obviously.

Mr. Dawkins ends the chapter with a rather (unusually, for him) qualified discussion about the implications of our lack of success in creating life in laboratories. Essentially, it boils down to the observation that there are too many variables to quantifiably estimate what this means! (For example, we're not even sure that scientists have succeeded in duplicating primeval Earth conditions.) He also estimates that the probability of life arising during any given billion year period falls between Statements 1 and 2 above. We don't actually get any argument to this effect (though he produces an interesting, if explicitly qualified, argument against a Statement 3 or 3+ level of probability based on lack of cosmic radio chatter.) But at this late date, this is hardly a serious breech.

On the other hand, maybe it is. His _assertion_ looks supiciously similar to what he himself told us back on 142-143 was a fallacious _argument_; because it relies on that 100 billion billion planet number, combined with the impression that life generated here, to produce an

impression of probability which cannot be used as an assumption due to its circularity. It also smacks of a subjective assessment of probability, which he's told us more recently is irrelevant to what actually _is_ a "good bet". But I'm tired of the whole topic, so I think I will leave this as an exercise for the reader.

Well, this has been a particularly long chapter; mainly because here we see the culmination of five previous chapters of misdirection, misidentification and flat-out presumption from Mr. Dawkins. He brings it all together into one swirling mush with one primary aim (along with several secondary ones): to discredit the miraculous as an option, so that Mr. Dawkins can spend the next few chapters not having to deal with it. I have necessarily had to jump back and forth parrying at numerous points, and occasionally to launch some ripostes; and I hope that you, the reader, have understood why and how I've argued as I have. At the end of his sixth chapter, Mr. Dawkins (_whatever_ else he's managed to accomplish, if anything) has yet to produce a single argument that the supernatural influence of a supernatural Designer on nature _does not_ exist; not a single argument that it _cannot_ exist; and not a single argument that it _has not_ happened with respect to human biology (much less anything else). We certainly get loads of assumptions and presumptions to this effect; we certainly get loads of argumentation which follow _from_ these presumptions, and loads of implications that they somehow lead _back to_ these presumptions. I suspect the swirling mush is necessary to keep up the illusion that something is being accomplished. Furthermore, as I've argued, if we take the time to actually check the implications of his argumentation, we find very suspicious holes that have not yet been filled; holes that seem to be danced around, deflected and outright ignored. Holes that _must_ be treated in that fashion, I think, because they are, in principle, not accountable for by naturalism.

Creative Fudging;
aka, Chapter 7: Constructive Evolution

I had hoped that, having played a gigantic shell-game with
us in the last chapter in order to (ostensibly) remove
miracles from contention, Mr. Dawkins would be content to
proceed with more-or-less straightforward biology from here
on out. (And on the seventh chapter, I rested, so to
speak!) However, there are some dangling issues left from
the positions previously taken which he still needs to
clear up (even assuming he had actually dealt with earlier
problems rather than juggling them around and tossing one
element over and behind his readers' heads while our
attention was fixed on the other elements.) He still has to
deal with one of the key problems in his whole theory; and
this chapter may offer what he considers to be the
solution. Let me present an excerpt from his first
paragraph in this chapter, to illustrate the range of
logical tensions involved in this aspect of his theory:

p 169, "[Some people may ask] Does [natural selection] not
merely subtract from what is already there, and shouldn't a
truly creative process add something, too? One can
partially answer this by pointing to a statue. Nothing is
added to the block of marble. The sculptor only subtracts,
but a beautiful statue emerges nevertheless. But this
metaphor can mislead, for some people leap straight to the
wrong part of the metaphor--the **fact** that the sculptor
is a conscious designer--and miss the important part:
the fact that the sculptor works by subtraction rather than
addition. Even this part of the metaphor should not be
taken too far. Natural selection may only subtract, but
mutation **can add**. There are ways in which mutation and
natural selection together can lead, over the long span of
geological time, to a building up of complexity that has
more in common with addition than with subtraction."
[italics mine]

Now, there are several points I want to make about this
paragraph; but let me start by giving credit where it's
due. If I recall correctly, early in the twentieth century
there was some scientific opposition to evolutionism
(that's the philosophy, not the biology) which centered on
the concept that natural selection only accounted for the
elimination of species, not the production of new ones. I
say that this was a mainly scientific criticism (though it
was, of course, used at the time by some theologians),

because it required the biology of the theory to be, in fact, true and cogent. The advocates were hoping, I suppose, to rein in the philosophical extrapolations of the biology by pointing out that (at the time) the biological theory didn't seem to be useful for setting up an alternative to Divine Creation; it didn't seem to be producing new species, just modifying already-existing ones. However, with the discovery and verification of mutagenic properties of DNA, the philosophers of evolutionism could (with some justification) refute this criticism: physically different and (relatively) more complicated DNA could come into existence through the natural order, and that allows for the rise of different species. Natural selection may be only eliminative; but biological evolution is not just natural selection processes, which are really (as far as species development is concerned) a macroenvironmental consideration. The chemical structures of the DNA themselves do apparently change, and though the change is posited as depending on an environmental effect (the mutational properties of radiation), this microenvironmental effect is not natural selection. It can provide new changes for macroscale natural selection to _work on_ (metaphorically speaking, of course.) I suspect we'll discover that the confusion between these two concepts bolsters the theory known as Lamarckism; but at any rate, I agree with Mr. Dawkins on this part.

To the second point: I would be one of the people who think that a "truly creative process" requires a real addition; and Mr. Dawkins' examples don't do much for me because (as we've already seen back in Chapter 3) _he_ thinks that real creativity exists, but that it is really something distinct from creativity--essentially that 6=16. I don't think that blind, purposeless nature can really 'create' in the sense which we generally apply to the word, and his example of the statue makes a perfect illustration for _my_ contention.

At first glance, the statue example looks _damaging_ to my contention, because the artist is taking something physical away from the statue (not physically 'adding to it'). Do I deny, then, that he is engaging in some kind of creativity? No, I do not deny it; but clearly, his creativity is not a factor of the _physical_ method by which he shapes the statue. Let us imagine he bumped into the block of marble, and it fell on the floor, and the shards that fell from the

statue (per huge natural improbability--_or_ perhaps via a
miracle) happened to be those that, once gone, a human form
was left over; would you, the reader, grant that this was
an instance of the artist's creativity? If not (and I
suspect the overwhelmingly vast majority of readers,
including Mr. Dawkins, would agree that this instance is
not an example of the artist's creativity), then we must
ask: 'what key element is different in the two examples?'

The first distinction between examples that comes to my
mind is that I've provided a single-step rather than a
cumulative-step process (at least on the face of it; the
shattering of the block into a statue is really a
cumulative-step process involving a cascade of numerous
small reactions.) Let me amend the example with an
obviously cumulative-step process. Let us imagine that the
block is made of sandstone, but with a marbilized interior.
(I have no idea whether this particular example is
physically possible; I chose the two minerals for their
commonly known properties, but it's certainly possible for
mineral formations to have high-density compressed cores
within low-density surrounding media.) The marble-in-the-
middle has a particular shape, which per this example is
purely the result of non-sentient geothermic forces
exerting pressure on the surrounding media. The artist is
not a sculptor, but someone thought he was and gave him the
sandstone block under the impression he could do something
with it. Being an absentminded sort, and something of a
procrastinator (rather like myself), he's left the
furshlugginer thing near the door--he hasn't a clue what to
do with it, and couldn't really care less about it. He's
also in the habit (unlike myself) of going out after a hard
day painting on his canvas and getting royally drunk. Each
night, he staggers in the door; and more often than not,
bumps into the sandstone block, tipping it over. Every time
it hits the floor, some of the sandstone shatters off; but
the more highly compressed marble remains largely intact.
Each morning the artist wakes up, shoves the block back
into place if he knocked it over the previous night, sweeps
up the fragments, and promptly forgets about its existence
so he can go paint. The marble is not indestructible, of
course, and over time as the accidents pile up, some of it
cracks off and is shed from the statue during a midnight
fall. The results of one night's impact forces have a
direct effect on how the next night's impact forces will be
distributed (and to what effects), and so on. One morning,
several years later, the artist wakes up, tips the block

back into place, sweeps up the fragments (fewer and mostly marble by now), and as he walks back into the room after dumping them in his usual fashion, he freezes in amazement. Lo and behold, near the front door stands a piece of marble which looks amazingly like a statue of a man! The block certainly didn't have this static property--neither the sandstone nor the original marble core, nor a combination of the two; it need not ever have had this shape, though the material was in such a configuration that this shape could potentially be reached. But it has the shape _now_, thanks to the cumulative process which has taken place over the last several years. Being an opportunistic sort, the artist releases the 'statue' into the public arena as his 'creation', and is critically hailed as an impressionistic genius.

Now: what is the _key_ difference between my examples (either one) and Mr. Dawkins' example of the sculptor? The answer should be obvious: accident (in my examples) vs. _intent_ (Mr. Dawkins' example). And Mr. Dawkins very clearly provides for explicit intent: "the **fact** that the sculptor **is a conscious designer**". Don't misunderstand me; I am _not_ advocating the AfD here (i.e., the statue appears to have design, and it has a designer; therefore nature, which appears designed, must have a designer.) I agree with Mr. Dawkins that _that_ extension of the metaphor into argument is a misstep. I'm trying to illustrate that what makes the sculpting a "creative" process is the _conscious intent_ of the sculptor; _that_ is the addition to the process which makes the difference.

But nature, as both Mr. Dawkins and I agree, is not conscious. Therefore, it cannot be (strictly speaking) creative. Reactions and counterreactions can result in mixes of material that, historically speaking, had not existed before _as that mix_; but this is no more 'creative' than the accidental drop of the block of stone, because no intent is provided. And if we propose that this non-purposive, non-sentient Fact (Nature) is the basic Ground of existence, then in what sense can _we_ be truly said to be _adding_ anything to the Natural mix? In no sense whatsoever; it's a nonsense proposition. In the long run, it's another illustration that if the actual implications of naturalism are followed out, it short-circuits the existence of _our_ ability to act; something which is necessary for us to propose a potentially valid argument (or be 'creative' in any true sense.)

So we have, in that one paragraph, a very complicated and
interesting puzzle. The artist _does_ have conscious
intent--this is an explicitly stated "fact" of Mr. Dawkins'
own example. We can discover pretty easily, by contrasting
another example, that the artist's 'creativity' _requires_
this fact to be true: blindly stumbling around in the dark
and knocking over the block so that it just happens,
without intent, to shatter into the rough shape of a man,
is not creativity (even if it happens over a cumulative-
step sequence). But this conscious intent is just what Mr.
Dawkins denies in Nature. The 'creativity' he assigns to
Nature, therefore, cannot be the creativity which we
recognize in the artist; it must mean something
qualitatively different (even if it happens to reach
similar results). We thus see two very different usages of
the term 'creative' at work here; the 6=16 paradigm from
back in Chapter 3 is still going strong. We also see, in
this paragraph, a definition of 'add' which is not really
'add'; mutation doesn't really add things to the mix in the
absolute way which we recognize in the artist, yet Mr.
Dawkins uses the term 'add' as an equivalent to bridge the
two concepts: see, nature _can_ 'add' something, right?
This is important because the naturalist needs that
'addition' somehow; but the addition we require for a
sensible argument and the 'addition' which nature itself is
limited to providing, are not functionally the same things,
except through tricks of English language. (I also note
that Mr. Dawkins even qualifies himself with this point:
the process of mutation and natural selection has features
"more in common with addition than subtraction." To me,
this says, 'Okay, it's not _really_ "addition", but the
results sort of look like addition to our limited mode of
perception.')

We may wonder why the two types of creativity _must_ be
asserted, when they conflict and hamper one another in a
system where basic reality has no intention. I suspect the
answer is because without 'really' real creativity, Mr.
Dawkins' own argument falls to the ground.

Having set a potentially troubling problem for himself (and
having planted the seeds of multiple-definition usage with
which he may try to 'get around' this later), Mr. Dawkins
proceeds for the next couple of pages with some straight
biology, detailing primarily how genes 'get along' with one
another in their own miniature environments. One or two

short excerpts require an equally short remark from me,
though, to keep our perspective on track.

p 169-170, "[T]here won't be a complete developing embryo
unless there is a whole program of chemical and cellular
events, under the influence of lots and lots of other
genes, and lots and lots of other, non-genetic, causal
influences."

I agree with this completely; but the reader should note
that, for all we can see to the contrary (which as of the
beginning of TBW's Chapter 7 is 'nothing', despite some
shell games from Mr. Dawkins), God could be one of those
causal influences; or He could be behind all the causal
influences. If He (so to speak) 'pokes' at a gene or some
other molecule to cause an effect (or pokes at lots of them
to cause lots of effects), the above quoted sentence would
still remain absolutely valid--just as it still remains
valid if _we_, using tools we've developed, do some poking
of our own. The point is that Mr. Dawkins builds up a
picture that excludes God partly by just not mentioning
Him; which is (I suppose) the proper way to go about things
assuming naturalism is true, but which is hardly a valid
method of "Revealing a Universe Without Design".

p 170, "Each gene is selected for its capacity to cooperate
successfully with the population of other genes that it is
likely to meet in bodies."

Setting aside the Designer metaphor in that sentence (which
I'm sure Mr. Dawkins would want us to ignore!), the
selection process he's describing is the chemical inability
of two sorts of genes to mesh with one another (or to
remain stable if they do); which is then compounded by
whether the animal produced by the new gene mix will be
more or less likely to spread its seed across 'genetic
space'. Of course, Mr. Dawkins himself corrects the
Designer metaphor when he writes:

p 171, "The choice between these two coevolutions doesn't
come about through advance planning."

Which is, of course, another flat assertion; not something
he's reached or developed _through_ argument, but something
upon which his argument _depends_. I don't mean to say, by
the way, that Mr. Dawkins _must have_ no arguments against
an 'Advanced Planner', so to speak; I only mean that,

insofar as TBW is concerned, he has yet to produce them. What we've seen to this point are attempts to _disguise_ the assumed premise, or attempts to simply _hammer through_ the assumed premise. Frankly, this doesn't actually leave me much grounds for suspecting that Mr. Dawkins _does_ have cogent arguments against God's existence and/or characteristics; but let that be as it may. The main point is that he's not producing them, if they actually exist.

Leaving that perrenial thorn in our side alone for a moment, I suppose Mr. Dawkins' (biological) arguments in Chapter 7 are, so far, fairly good. But I wonder a bit about the following two sentences, one of which is separated from the other by one paragraph:

p 171, "If the population happens to be **already** rich in genes for B1 and C1, this will set up a climate favouring the A1 gene rather than the A2 gene. [...] [T]he same will obviously be true of these 'other' genes themselves..." [italics mine]

I had to work that out a couple of times before I realized (I guess) that Mr. Dawkins does _not_ mean, in the second sentence, that the B1 or C1 gene needs to simultaneously have an environment already rich in A1 genes; who in turn need an environment already rich in B1 and C1 genes. At first, it seemed he was painting a picture of the whole thing holding itself up by its bootstraps (essentially violating the law of noncontradiction, as far as a dependent entity goes); but then I noticed that, per his example, "coevolving" doesn't necessarily mean they all evolved at about the same time. I think. His topical structure isn't very clear to me here; possibly, I'm just being a bit paranoid after seeing some of his other logical clunkers! But at any rate, we _can_ be sure that the A1, B1, and C1 genes didn't _all_ require an environment rich in _each other's_ presences before they individually developed; so he must mean something else.

I must suppose, for instance, that when he writes:

p 172, "Genes for making teeth suitable for chewing meat tend to be favoured in a 'climate' dominated by genes making guts suitable for digesting meat... and vice versa... Teams of 'meat-eating genes' tend to evolve together..."

He only means that 'If teeth more favored for eating meat evolve first, guts more favored for evolving meat will tend to evolve afterwards, and vice versa'. Yet, I have a hard time shaking the impression that he's engaging in (yet another) highly circular argument. I suppose it's the Boy Who Cried Wolf effect.

Assuming in his favor that he actually _doesn't_ mean something self-contradictive by this, he continues with some interesting biological data through p 173, where he digresses for a moment to discuss 'disk fragmentation'-- what happens to a disk drive (hard drives are, by the way, disk drives in case you didn't know) and its data thanks to how operating systems tend to 'delete' files. In fact (unless specific system-operator commands are given), the information is not deleted; just the pointer. Mr. Dawkins' analogy of the librarian tearing up the index card to a book is perfect; and in fact, on your disk, the computer may need numerous 'index cards' just to find one file. At the same time, numerous file fragments which the operating system no longer recognizes as 'files' still exist on the disk; until, say, someone 'formats' the disk and forcibly resets all the magnetic potentials to a neutral setting. That's why, if you erase something by accident, you might be able to recover it; and also why, depending on the amount of time which passed since you mistakenly erased your file, you may _not_ be able to recover it (it's been written over as 'free space' already.) It's also why the computer occasionally misplaces or loses files, though typically they're completely recoverable with a system utility like Norton's Disk Doctor (no, I don't work for them!)

Of course, Mr. Dawkins can't quite resist making the librarian's example an order to destroy a copy of _Lady Chatterly's Lover_; remember, every little bit which can make a theist seem a tad more silly counts towards discrediting (before the fact) anything he might bring up later. (That book was once on the Church's hit list.) But otherwise, disk defragmentation makes a good analogy for explaining why there's a hunk of genetic code which doesn't appear to be doing anything _now_.

p 174, "A computer error (or, to be fair, it may have been human error) caused me accidentally to 'erase' the disc containing Chapter 3."

Ouch!! I totally sympathize. I was once 80+ pages into a
screenplay, when a corrupted disk sector ended up wiping
out about half of it; and like a fool, I hadn't been
backing up properly. In my case, it was unrecoverable; the
disc surface itself had failed. I simply couldn't bring
myself to rewrite from scratch all the inordinately cool
things which I'd done after page 37; so it sits now
somewhere silently, probably never to be touched again. And
here I am today! (See? You can blame SMB on a faulty
computer disk!) Fortunately (or unfortunately, depending on
your own opinion of TBW), Mr. Dawkins' error wasn't nearly
as catastrophic; but just reading about close calls like
that gives me the shivers. Brrrr...

We get plenty of more good biology (sort of refreshing,
actually) through p 176, though a sentence construction
there reminded me of a pet peeve I mentioned earlier:

"It seems that, once the eukaryotic cell had been
invented, a whole new range of **designs** became
possible." [italics mine]

As I noted at the beginning of Chapter 4, I really wish
he'd find another terminology set if he wants to get the
reader away from the concept of 'invention' and 'design' in
nature. At least he should play fair and not keep casually
bringing up the terms like that. I opined at the time that
one reason he doesn't watch his language more closely
(relying instead on the occasional 'plonking' of assertions
along the lines of, 'But, by the way, remember there's no
God'), might be because he intends to sneak real invention
and design back into the theory through the common uses of
these terms. He certainly seems to be explicitly setting up
'creative' and its grammatic relatives in that fashion. I
guess we'll see; I think it's worth keeping the option in
mind even if he doesn't go that route, as other writers
could well try that trick. (Hindsight note: he eventually
tries this sort of thing explicitly, though in a very
limited and offhand way, in Chapter 11.)

Yet more good textbook biology up through p 177, though he
applies once again to a concept which is going to cause him
some trouble:

p 177, "Many-celled bodies make it possible for genes to
manipulate the world, using tools built on a scale that is
orders of magnitude larger than the scale of single cells.

They achieve these large-scale indirect manipulations via
their more direct effects on the miniature scale of cells.
For instance, they change the shape of the cell membrane.
The cells then interact with one another in huge
populations to produce large-scale group effects such as an
arm or a leg or (more indirectly) a [book about
evolutionism]."

Well, actually he says "a beaver's dam", but I thought I'd
put things in perspective! Keep in mind that these genes
and cell membranes and such are _not_ conscious, sentient,
purposive, or anything of that quality; and Mr. Dawkins has
clearly kept that transmission of the non-intentionality
property in the case of the beaver's dam (back on his pp
135-136.) The question is how plausibly he can propose
intentionality as an "emergent property" while sticking to
the actual precepts of his own system--and whether it will
require him to fudge concepts, like creativity that really
is creativity but is really not creativity!

The arms race concept introduced on p 177 is a very clever
one. It even has a great pun--e.g., the existence of
cheetahs means that gazelles which randomly mutate so that
their legs (or 'arms') are more efficient, will be more
likely to spread that new efficiency through the gazelle
gene pool; which consequently means that random mutations
which happen to make cheetahs' 'arms' more efficient at
running will also spread through their gene pool.
(Actually, the cheetahs' gene pool is a very weird topic in
itself, as they appear to be all highly inbred; but the
principle still holds.) Thus in predator/prey relations of
that sort, which illustrate the principle, there is quite
literally an 'arms race'!

I want the reader to note, however, that in such a system
it is entirely possible for a species to be introduced into
a biosphere where it is _too_ efficient at harnessing
resources. In the case of herbivores, this means that there
will shortly be a swarm of them and possibly defloration.
In the case of carnivores, this means that competing
carnivores could well be wiped out before random mutation
and natural selection allow them to catch up--and prey
animals may be wiped out, too. In the case of an omnivorous
species, a combination of these effects may take place.
There is nothing, physically speaking, 'wrong' with this
scenario; it's just what happens. The reader may feel free
to explain this to some American Indians sometime; make

sure to remind them that we Caucasians are not at fault. We're just more efficient.

I'm being facetious, of course. The point is that Mr. Dawkins, who expresses righteous indignation at humans wiping out thylacines and against "racist assumptions", treats the sort of animal kingdom arms races which must have produced those attitudes in us, if naturalism is true, with a thoroughly neutral attitude. There's a huge inconsistency somewhere.

A nice little discussion on the effects of inorganic environmental pressures on evolution, bottom of p 178 through top of p 179; and then we return to the arms race.

p 179, "There are other parts of an animal's environment that change in more consistently malevolent directions... Lions are enemies of zebras. It may seem a little callous to reverse the statement to 'Zebras are enemies of lions'. The role of the zebra in the relationship seems too innocent and wronged to warrant the pejorative 'enemy'. But individual zebras do everything in their power to resist being eaten by lions, and from the lions' point of view this is making life harder for them. If zebras and other grazers all succeeded in their aim, the lions would die of starvation. So by our definition zebras are enemies of lions."

Does this mean that consistent malevolence isn't really malevolence--it's only a point-of-view perception? What would happen if we replaced lions/zebras with ranchers/thylacids or settlers/natives? Naturalistically speaking, there appears to be no difference. The same arms race pressures occur between competitors, too (e.g., cheetahs get faster because lions get stronger, etc.) The more efficient African bees usurp and displace native Brazillian bees, for instance. (A somewhat different result, thanks to the interbreeding process, but which certainly has parallels in human history--come to think of it, a few parallels in that general region of the world!)

p 181, "The evolutionary analogy is close enough to justify borrowing the term ['arms race'], and I make no apology to my pompous colleagues who would purge our language of such illuminating terms."

I agree; it helps illuminate that Mr. Dawkins is highly inconsistent in his application of the implications of the physical principles. The next time he passes a judgment on human greed, ruthlessness or the like, remember that [p 181] "Arms races sometimes culminate in extinction", and then ask yourself on what _other_ grounds he wishes us to accept his condemnations.

p 181, "But the time has come to admit that in my efforts to explain this one valid point I may have misled the reader in other ways... Before resuming the discussion of arms races, it is my duty to forestall misunderstandings."

Fair enough; I hope for the sake of his argument that my observation is one of the misunderstandings which he intends to remove by qualifying himself. Let's see:

Qualification #1: [p 181], "The reader might have come away with a Victorian idea of the inexorability of progress..." The correction: "Progressive 'improvement' of the kind suggested by the arms-race image does go on..."

Um... okay. Actually, what Mr. Dawkins is correcting is the impression that _every_ given generation is [p 181] "better, finer and braver than its parents." But that correction leaves the basic _proposition_ of the developmentalists still true; despite his low opinion of them. Barring catastrophic environmental change, humans _are_ supposed to be getting better and better; the only difference is the time-frame, which was used by the developmentalists to (among other things) disparage earlier ideas because they were 'earlier'. For example, some social developmentalists advocating increased public sexual expression in the early 20th century justified it mainly on the grounds that its presumed opposite was a 'Victorian' idea. Not that Mr. Dawkins would also consider _himself_ guilty of that sort of chronological snobbery, of course.

Qualification #2: [pp 181-182] "The relationship I am calling 'enemy' is more complicated than the simple bilateral relationship suggested by the stories of cheetahs and gazelles. [...] It may be convenient to think of an arms race between two lineages such as cattle and grass, or gazelles and cheetahs, but we should never lose sight of the fact that both participants have other enemies against whom they are simultaneously running other arms races."

I think this is a good point; and also has some bearing to
my earlier notation along the lines that lions getting
stronger means cheetahs getting faster. Predator/prey are
in competition, but prey/prey are in competition, too, as
well as predator/predator. And I further agree that Mr.
Dawkins makes sense when he writes:

p 182, "[Though] I shall not pursue the point here... it
can be developed into one of the explanations for why
particular arms races stabilize and do not go on forever--
do not lead to predators pursuing their prey at Mach 2 and
so on."

Although I agree with this in principle, I wonder whether
this means that Mr. Dawkins thinks "Progressive
'improvement' of the kind suggested by the arms-race image
does go on", and yet also thinks that "[P]articular arms
races stabilize and do not go on forever." There would seem
to be a limited (though admittedly wide) range of options
that could be improved in this fashion. Either some
particular arms races do _not_ stabilize, and _do_ go on
forever; or else generally 'progressive improvement'
doesn't exactly go on. It might be possible to defend both
positions, but they need more clarification; and after some
of his other creative fudging, I'm a bit leery. Also, I
think the evidence we have of biomechanical properties can
allow us to put certain limits on development anyway; _I_
at least have never seen biological arguments that a
species actually _could_ develop the ability to run at Mach
2! Unfortunately, this doesn't appear to be one of the
misunderstandings which Mr. Dawkins intends to clear up
(which is too bad, since clearing it up actually helps the
plausibility of his argument a bit.)

Qualification #3: [p 182] "I said that cheetahs, unlike the
weather, had a tendency as the generations go by to become
'better hunters', to become more severe enemies, better
equipped to kill gazelles. But this does not imply that
they become more _successful_ at killing gazelles.'
[italics his]

Another good point; which makes common sense, if you think
about it. If they got steadily more successful at killing
gazelles, the gazelles would soon be extinct--unless a
random mutation were introduced into the gene pool which
vastly increased the birth-rate of the gazelles. Of course,
the local flora would soon reach a saturation point, and

the gazelles would start starving to death--perhaps
providing more food for the cheetah population. Eventually,
things would stabilize at a new level, but not likely at a
very healthy one for either species. But it's a moot
speculation, since what actually happens is that both
species exert generally coequal 'pressure' on each other.
However, there must be a brief period of time wherein
cheetahs or gazelles get a bit of an edge on the other,
else there would be no pressure from one species providing
a better environment for favorable mutations to spread.
(i.e., the mutations might spread anyway, but we couldn't
say it was _because of_ the arms race.)

p 183, "Some people think that native Australian species
are usually driven extinct by superior competitors or
enemies introduced from the outside world, because the
native species are 'older', 'out of date' models, in the
same position vis-a-vis invading species as a Jutland
battleship contending with a nuclear submarine. But the
assumption that Australia has a 'living fossil' fauna is
hard to justify. Perhaps a good case for it might be made,
but it seldom is. I'm afraid it may be no more than the
zoological equivalent of chauvinistic snobbery, analogous
to the attitude that sees every Australian as an uncouth
swagman with not much under his hat and corks dangling
round the brim."

I've taken the opportunity to quote that extended section,
because it has superficial similarities to my remark
earlier concerning the question of why Mr. Dawkins
expresses indignation over 'racist assumptions', or
ranchers killing thalycids, or (for that matter)
chauvinistic snobbery! This is not really a reply to my
point, though; my point didn't depend on perceptions of the
native species being 'older' or 'out of date'. It depended
on the native species being notably less efficient than the
'invading' species, and the natural result of the two
suddenly being thrust into competition. Thylacids may have
in fact been an 'older' species than man, insofar as the
species had been around longer on the planet; but that's
not why the ranchers were able to drive them into
extinction. The thalycids were incapable of competing
efficiently for the same resources as the ranchers. This is
not idle (or chauvinistic) speculation; it's self-evidently
true. By default, if they had been able to compete
sufficiently well with the new competition, there would
still be some thalycids. Similarly, the Confederacy in the

American Civil War may have, in fact, been more efficient
than the Union at shooting, using the land, or even in
generalship. But we lost, because the Union was supremely
more efficient at producing the resources which it may
have, in fact, used less efficiently (taken at a point-by-
point basis) than the Confederacy. We may console ourselves
with jokes describing how brave and skilled we were, etc.;
but the fact of the matter is that when the numbers tallied
up, the Union was more efficient at implementing its
policies than we were. This also is not idle speculation;
it's a cold, hard fact. We lost; they won.

The reader will perhaps have noticed that in the preceeding
paragraph I've avoided introducing ethical judgments into
this analysis. That's because at this level, the level of
mere efficiency, the results and causes may be discussed
without them. Efficiency issues are rarely connected in a
necessary fashion with ethical issues. I agree that it was
ethically better for the Union to win. I also agree that,
ethically speaking, the American Indians were in the
'right' much more often than not; nevertheless, they lost.
We won. Might does not make right; and right does not make
might. It is incontestably true that American settlers were
more efficient at securing, protecting and using resources
than the American Indians. But that didn't make us right.
It is incontestably true that the German _wehrmacht_ was
more efficient at prosecuting its goals than the Polish
Army; that didn't make the Nazis right. It is incontestably
true that the Union was ultimately more efficient at
achieving its goals than the Confederacy; but that's not
why I think they were _right_. I certainly don't think they
were _wrong_ because they were more efficient. My judgement
of the ethical issues surrounding these events is not based
on the relative efficiency of the participants. I might
agree it was wrong for the ranchers to exterminate the
thalycids; but the fact of the matter is that the thalycids
were less efficient than the ranchers at doing what they
did. And natural selection (given that the efficiency
disparity was so great that random mutation had no time to
provide the thalycids a chance) dictated that they would be
exterminated should the two forces meet. A damsel tied to a
train-track may have enough physical resistance to trip up
a dog running down the tracks, yet it's entirely possible
to predict what will happen when the train gets there. That
disparity is not why I think it wrong for the damsel to be
tied there; I can think of a few humans with similar

physical resistance whom I would consider it a 'good' thing
to thus grease the wheels of a locomotive!

Again, the section I last quoted from Mr. Dawkins is not a
reply of any sort to my charge. If it does anything, it
adds to his problem a bit; why (naturalistically speaking)
should we not be chauvinistically snobbish? For that
matter, is it even _possible_ to not be that way, if we
play strictly by the rules of naturalism? I don't perceive
that cheetahs are under the same injunction not to be
snobbish about their own species at the expense of the
gazelles. I don't perceive that even Mr. Dawkins expects
that they _should not be_ (if they are.) Cheetahs do what
they do for themselves, and possibly for a few other
cheetahs; driver ants do what they do only for the other
particular driver ants in their colony. _Naturalistically
speaking_, the American settlers and the Australian
ranchers were doing the same thing. Yet no blame is
assigned to the cheetahs or the driver ants; not by me, not
by Mr. Dawkins. He and I both blame the ranchers (and from
his comments, I think I could reasonably guess he'd share
my opinion about the abuse of the Native Americans.) DOES
THIS NOT STRIKE THE READER AS VERY ODD??

The 'Red Queen' concept of biological arms races (coined by
Leigh van Valen) is brought up near the bottom of p 183,
and discussed throughout the next several pages. It's a
clever way of illustrating that though a particular
individual of Generation T is likely to be more efficient
than a particular individual of Generation B, the overall
success of the Generation T 'cloud' (to borrow one of my
own phrases from earlier in this book) is not likely to be
greater than B's overall success rate--because the
opposition is also getting 'better' than it used to be.
(The Red Queen herself from Carrol's _Through the Looking
Glass_ doesn't exactly illustrate this principle, since
she's not in competition with anyone, but she does
illustrate the result: running faster and faster and yet
not gaining any ground.) Mr. Dawkins reminds us, though,
that:

p 184, "Unfortunately, natural selection doesn't care about
total economies, and it has no room for cartels and
agreements."

The name of the game in nature is that the efficient, and
those who can grow more efficient, survive. Morality is not

an issue. As Mr. Dawkins writes on the same page, "[S]o
long as one of [two competitors for resources] escalates
none can afford _not_ to." [italics his] Why does this
principle not apply to human behavior when Mr. Dawkins
wishes us to recognize and reprobate injustice? _I_ know
why; but then, I'm not a philosophical naturalist.

p 184, "Once again, by the way, I should stress that I have
told the story too simply."

How so? Let's see...

"I do not mean to suggest that in every literal generation
trees are taller than their counterparts in the previous
generation, nor that the arms race is necessarily still
going on."

Both points of which make good sense; but neither of which
addresses the disparity of moral perception which I've been
highlighting. Perhaps the difference is that (thalycid and
lobster laments aside) a great deal--probably the great
majority--of the injustice in the world comes from members
of our species mistreating other members of our species.
Maybe interspecies arms racing is something humans _should
not_ be doing? If so, it would be very peculiar that humans
are for some reason excluded from a general behavorial
principle like this. However, it's a moot point because:

p 185, "Another point illustrated by the trees is that arms
races do not necessarily have to be between members of
different species. Individual trees are just as likely to
be harmfully overshadowed by members of their own species
as by members of other species. **Probably more so in fact,
for all organisms are more seriously threatened by
competition from their own species than from others.**
Members of one's own species are competitors for the same
resources, to a much more detailed extent, than members of
other species." [italics mine]

So, in fact, ruthless competition between individuals of a
species is quite common in nature; and in fact, given the
specific resources involved, even more likely to happen.
(For example, a male wolf isn't going to fight a male
mountain lion for the chance to mate with a female mountain
lion.) That being the case, similar examples of human
ruthlessness to humans have natural sanction. On what
grounds _should_ we oppose it? For that matter, on what

grounds _can_ we oppose it? A philosophical naturalist must
either recourse to natural grounds (and simultaneously
explain why he's not being self-contradictory), or else he
must recourse to supernatural grounds--at which point he's
abandoned naturalism as a working option. Or, like Mr.
Dawkins so far, he can avoid dealing with the question;
though that hardly makes for a ringing endorsement for
naturalistic theory, since the opposition (theists, for
instance) will be bringing it up constantly!

On pp 185-187, we get a fun and useful analogy with real
human arms races, specifically missle systems vs. guidance
jammers (for assymetric development) and thermonuclear
bombs (for symmetrical development.) The missles/jammers
make a good analogy for why assymetrical development tends
to produce far more refined oppositions. I see this in
philosophy, too; competing theist theories (say, Baptist
vs. Presbyterian) are far less detailed in the things we
agree upon (e.g., the existence of a Creator God) than in
things we don't agree upon (free will implications vs.
predestination implications.) And I doubt either side would
be quite as complex even with our disagreements had both of
us no more radical opposition to contend with (e.g.,
atheists of various stripes.)

An even better discussion follows on pp 188-190 concerning
the Encephalization Quotient, as used by Harry Jerison: a
rather complicated serious of logarithms regarding brain
weight vs. body weight (and other factors) which provide a
quantitative means of comparing relative brain
functionality. A quick throwaway quote from p 188 brings up
an interesting issue, though:

"Very rarely a dead animal or plant fossilizes..."

You might remember from a couple of chapters ago that I
wondered why Mr. Dawkins would focus so heavily on
probability to the exclusion of actual data we have from
the fossil record. I think my conclusion (it allows him to
'get rid' of competitive theories before going to the data-
-or, rather, allows him to seem as though he has) is still
valid; but apparently one reason why Mr. Dawkins doesn't
recourse to the actual data sooner, is that the fossil
record has some problems. Naturally it would, since (as he
points out) living things don't normally fossilize. In
fact, the conditions for fossilization are rather limited;
usually what happens instead is that the body is absorbed

by predators and scavangers over time, or otherwise
biodegrades, without much of a permanent trace. That being
the case, it's probably hard to use the fossil record as
justification for long-term evolutionary processes. On the
other hand, to be fair, it's similarly hard to use it
against evolution; assuming evolution is correct, the
relative lack of hard data supporting it in the fossil
record would still be explicable under naturalistic
evolutionism. We'll be getting back to the fossil record in
much more detail in Chapter 9, "Puncturing Punctuationism".
(Nice title, too!)

Anyway, Mr. Jerison has reconstructed a reasonably probable
EQ for ancient animals and discovered that the sorts of EQ
differences we find in today's animals held true way-back-
when; the main (and particularly interesting difference)
being that the physical EQ of an ancient animal filling
ecological niche 'Z' tends to be less than the physical EQ
of an animal filling the same niche today.

From here we move to a discussion about the conditions
under which an arms race could end. I note that [p 190],
"Sometimes they may end with one side going extinct...",
though Mr. Dawkins has nothing to say at this point
regarding, for instance, ranchers and thalycids. Probably
just as well! Physical speed limits for cheetahs and
gazelles are brought up (finally), but not given much
attention since the arms race between them is likely to
stabilize a lot more quickly for what Mr. Dawkins terms
"economic" reasons. I take his explanation to mean that a
given species has something like an energy budget
(constrained by its metabolism and foods) which doesn't
necessarily progress in efficiency and/or capacity as
quickly as other species characteristics (like the body's
tools for fast running.) That being the case, a random
mutation which produces a faster runner might make the
animal in question less efficient at bearing children (for
instance), which offsets or maybe even reduces its chances
of propagating its new gene sequence into the communal
pool. The particular example Mr. Dawkins uses for this
(rabbits and foxes) doesn't quite hold to the analogy--
rabbits are not only faster than foxes but breed more
prolifically, to the extent of being the subject of jokes!-
-but the principle is a good one, I think, and still
obtains from the theory. In this case, the rabbit's
physical setup was already such that it could continue
evolving faster running speed before hitting the

reproduction efficiency wall (if that's what it in fact
hit), _compared to_ the fox. So his example still holds
good.

Well, despite some creative fudging here and there by Mr.
Dawkins early in the chapter (to be expected as he
applies... well, I'll call them 'arguments'... developed
just prior), I have to admit this particular chapter seems
reasonably well set-up. The disparity between morality and
actual 'natural' behavior expected of animals seems to be
the main problem in this chapter, but this doesn't
invalidate the particular arguments themselves--it has been
more of a side-issue to be brought out as we went along.
The chapter ends with a couple of things worth noting.

First, on p 192, we get a very curious short paragraph:

"We are unlikely to witness arms races in dynamic progress,
because they are unlikely to be running at any particular
'moment' of geological time, such as our time. But the
animals that are to be seen in our time can be interpreted
as the end-products of an arms race that was run in the
past."

On the face of it, this looks very much like a statement to
the effect that we have, in fact, _no real evidence that
this is happening and/or has happened!_ The argument seems
(at this point) to rest entirely on our ability to
interpret the animal data we find _such that_ it's a
coherent abstract argument. That being the case, the vast
number of staggering proceedural errors which I've
uncovered so far can hardly count in favor of the liklihood
he's correct! (Come to think of it, it's hard to imagine
just how good such positive evidence in favor of the theory
would have to be to overcome his numerous goofs.) However,
I have a hard time believing that the whole enterprise
rests on what amounts to a wish-fulfillment speculation
(e.g., gosh it would be nice if theism was wrong. Can we
find a coherent way of interpreting the animal data we have
so that we can produce a theory that doesn't require God?)
Surely, at this late date, there must be some kind of
objective evidence in support of the actual theory itself
(not just objective evidence that has to be shoehorned,
successfully or otherwise, into the theory.) I'll suppose
in his favor that he'll get to this in Chapter 9; but the
existence of this paragraph, to say the least, doesn't seem
to bode well for Mr. Dawkins.

Next, on p 192, we get a summary of positions developed in
this chapter wherein a picture is painted of genes
cooperating with one another to mutual benefit within the
human body. This might seem an unintentional-yet-effective
response to one of my main gripes in this chapter, the
disparity of expected moral behavior within philosophical
naturalism. That is, the reader might say, 'Since genes
cooperate with one another for survival, we _should_ too--
or at least it is natural for us to cooperate with each
other.' Perhaps so; but let's take a look at the fuller
picture.

a.) It is an incontestable fact that, though many species
do exhibit large-scale cooperative behaviors within the
species members, many more (perhaps most?) species don't
have this feature. Widespread cooperation between members
is not apparently a necessary survival tactic applicable to
any and every natural species as a broad requirement. Some
species (like asexually reproducing microorganisms) don't
appear to cooperate at all with other species members, and
they survive just fine.

b.) Even within those species where members collaborate in
groups (of whatever size), the groups tend to compete
strongly (sometimes exceedingly ruthlessly) with other
groups in the same species. Much human social injustice
comes from this sort of behavior; but it is apparently
'natural' to do so.

c.) Even Mr. Dawkins admits that intraspecies competition
is likely to be fiercer than competition _between_ species,
thanks to dovetailing resources specific to the survival of
that particular species; sexual access came to my mind as a
chief example of this. (No Freudian jokes, please!)

d.) These things taken together indicate that ruthless
competition to one degree or other is a natural instinct.

e.) The question of _why_ or _whether_ we _should_ try to
overcome this apparently natural instinct (above and beyond
the degree to which we're already naturally cooperative--
e.g., the Nazi party cooperated pretty effectively against
Jews and gypsies during the Holocaust) tacitly assumes that
we are in fact capable of doing this--a very strange claim
to make within an interlocked worldview such as naturalism.
So, for instance, the question 'Should we exterminate

thalycids' assumes that we are capable of acting in a
fashion which is not instinctual; otherwise, the question
would never arise--we would just either exterminate them or
not. The question '_Why_ should we (or should we not)
exterminate them' is even more complicated, and assumes an
even further separation from instinctual reaction.

My point is this: even assuming a human instinct to
cooperate with other humans, this does not begin to cover a
naturalistic explanation of real morality. It might of
course begin to cover a naturalistic explanation of
apparent morality. That is, it's not really wrong for us
to exhibit racial assumptions of superiority, but Mr.
Dawkins' _feeling_ that it is wrong for us to do so (or,
put the other way, his _feeling_ that we 'should' ignore
such assumptions) can be explained. It isn't what it seems
to be; he's not asserting anything true or potentially true
with such calls to action, but only reacting to
environmental pressures (such as an instinct for
cooperation) which were bound to produce that behavior in
him. Similarly, though, Fleeming Jenkin (whose extended
quote on TBW's p 113-114 brought out Mr. Dawkins' request
that we not "be distracted by the racist assumptions of
white superiority") was bound to have those attitudes
thanks to the environment which he inhabited. He can't be
held accountable for them in any fashion; they just sort of
happened through him. And a human instinct to cooperate
with other humans doesn't cover Mr. Dawkins' readiness to
chew out the Australian ranchers or people who boil
lobsters. Even if it did, it would run into the same
problem I just mentioned: it's an instinct, which Mr.
Dawkins either was born with or which was perhaps produced
in him by his environment. And an instinct to cooperate
between humans obviously can't be particularly widespread,
or else the massive social injustices which most people
recognize as existing in principle (even if we differ as to
exactly who is being unjust to whom) would not exist. At
best, it appears to be strong only within a limited
selection of like-types; a black man is highly unlikely to
join the Ku Klux Klan anytime soon, nor are they likely to
let him in. (I am, of course, choosing particularly clear-
cut examples of the principle in operation.)

Another way to illustrate the same point is to simply note
that if the reader suggests that I 'should' do such-n-such
because I have an instinct to cooperate (which,
consequently, I 'should not' be resisting), then you've

tacitly admitted that my _actual_ behaviors and/or
abilities in this matter cannot be completely produced by
any nonrational, automatic processes (such as instincts),
either singly or in combination. If my _actual_ abilities
or behaviors were purely derived from such entities, then
it would be entirely useless to _argue_ your point. That
is, at the very best, your argument would not really be
functioning as 'an argument'. It would be just one more bit
of environmental data that might (in some kind of
aggregational fashion) tip the scales of my behavior in a
different direction. The question of whether (or how) you
might possibly be _correct_ would be a nonissue. And so we
see a common refrain of mine during this whole book,
approached once more but from a somewhat different
direction: if your (or my, or Mr. Dawkins') arguments are
not _really_ arguments, then a.) are you ready to live as
though this were true, and b.) is it even _possible_ to
'live as though this were true'? If the answer to either or
both of these questions (particularly b) is "No", then
there are really only two options: attempt to redefine
naturalism such that it somehow provides for real
argumentation, and not just behavior ultimately dependent
on reactions to utterly nonrational forces; or reject
naturalism.

Here's yet another way to illustrate this point:

p 193, "Bodies evolve integrated and coherent
purposefulness because genes are selected in the
environment provided by other genes _within the same
species_." [italics his]

The question I want the reader to ask herself here is this:
what can Mr. Dawkins possibly mean by "purposefulness" that
is consistent _with what he has already told us?_ This is a
somewhat different question than asking what he could
possibly mean by "purposefulness" (period). Taken simply as
itself, the sentence looks as though he could mean the
ability to act and have consciousness and have real
purposes (not just that some other entity which happens to
have these qualities could perceive an illusory purpose for
our behaviors thanks to _that_ entity's capability of
perceiving causes, effects, ends, means and the necessary
links between them). But is this even consistent with what
he's already told us? Time after time, throughout TBW so
far (particularly in the beaver example), he has contended
that the nonintentionality of atomic and subatomic

particles--the fact that they only react, not act; the fact
that they are nonsentient, non-purposive--is transferred as
a property right up the line to macroscale behavior of
macroscale entities (like beavers and bats.) _NOW_, all of
a sudden, in one throwaway sentence, he's asking us to
jettison this notion; either that, or he means something
entirely different by 'purposefulness' here than he meant
when he asserted that microscale entities and nature as a
whole are non-purposive (you remember; back when he was
making those contentions in order to remind us that there's
no God.)

This is an extremely serious inconsistency in his work;
either way, he's contradicting or refuting himself. There's
no reason to even bring other philosohpical contentions
into the debate. What's more, the structure of his argument
apparently _requires_ that these internal self-
contradictions/self-refutations be present. The 6=16
paradigm keeps rolling on, as Mr. Dawkins creatively fudges
his way through his argument that "The Evidence of
Evolution Reveals a Universe Without Design".

A Feather On A Camel's Back;
aka, Chapter 8: Explosions and spirals

One of the things I find I'm having to watch for as I
plunge ahead into the latter half of TBW, is a creeping
sense of... well, lethargy, I guess. I think I've already
seriously gutted TBW itself; and I keep getting the
impression 'Well, I can sit back now; he's unlikely to
write anything else that needs more than some upkeep-style
attention.' This would be an unfair impression on several
grounds. First, it's unfair to Mr. Dawkins himself, since
resting on whatever laurels I may have earned at this point
could effectively deny him the opportunity, in TBW, to make
a staggering comeback--one which I'll have to recognize if
I'm playing fair. Second, it's also unfair to Mr. Dawkins
insofar as he does write some good biology occasionally,
and even scores a few minor philosophical points; and I
wouldn't be fair if I didn't keep up a running appreciation
of these, too (even assuming he keeps crippling his
argument at every opportunity.) If I'm going to embark on a
large-scale, comprehensive analysis of TBW, then I've got
to keep my end of the bargain up. Third, it's unfair to
you, the reader; who (if Mr. Dawkins manages to seriously
redeem his effort) deserves to know about it--and deserves
to see me eat some crow! Fourth, it's unfair to you, the
reader, because so far Mr. Dawkins has demonstrated a knack
which I didn't expect when I decided to write this book: he
seems to find new ways to shoot his own argument in the
brain (so to speak) every chapter, sometimes in ways that
are not immediately obvious to a casual reader. I think you
deserve to know about these, too; otherwise, there wouldn't
be much point in my writing this book at all!

Another reason for my lethargy may be that as Mr. Dawkins
continues through the book, we're probably going to see
more emphasis on science-vs-science arguments (i.e., rival
views within evolution, or scientific rivals to evolution).
These are the sorts of things I go to Mr. Dawkins his
colleagues _for_, to be instructed in; not to criticize. I
would very much like to heave a sigh of relief and just
appreciate any good science that happens to be on the
buffet from here on out. Unforunately, Mr. Dawkins hasn't
quite impressed me so far with an ability to analyze and
refute opposing viewpoints effectively--by which I mean in
a systematically coherent way. Some of his missteps have
been very subtle ones. This is making it rather difficult

for me to work up much confidence or trust in his ability
to argue coherently from here on out.

Finally, I suppose some of it stems from what I like to
call the 'dueling rattlesnakes' effect. It may be necessary
and even enjoyable, in a way, to fight a rattlesnake; but
the stress involved tends to accumulate quickly! Let's face
it: I've got quite a bit to lose should Mr. Dawkins make an
11th hour rally in favor of his theory, don't I? It's never
easy (or comfortable, for that matter) to immerse one's
self in an oppositional argument, particularly a book-long
one--something you, the reader, may very well sympathize
with concerning my own book! If so, and if you've
nevertheless managed to hang with me this far (despite any
uncomfortable issues I might have exposed--or perhaps even
despite what turns out to be _my_ cruddy argumentation!),
then I salute and respect your perseverence. Aside from
agreeing not to simply reject anything I might have to say,
out of hand, before I even get to it, I can hardly ask
anything more from you--and I thank you for bearing with
Mr. Dawkins and myself this long.

Ah, well; I guess I've caught my breath sufficiently. Let's
forge on together; we're on the downhill slope now, and one
way or another it'll be over soon.

Mr. Dawkins begins this chapter with a warning about
analogies; to the effect that they can sometimes be useful,
but can often be taken the wrong way (and thus lose their
usefulness.) There's a further short paragraph on one of
the distinctions which he uses to separate the scientist
from the crank--the ability of the scientist to rule out
false analogies (_both_ sorts are usually capable of
discerning plenty of analogies!) In a (rather rare) bit of
slightly self-deprecating humor, he notes that this
distinction is itself yet another evolutionistic analogy,
which may be foolish or fruitful! It's sort of nice to see
him qualifying himself for a change. And the whole
introduction is set up to warn the reader [p 196, near the
top] that he's about to embark on two interconnected
analogies. It's nice to see Mr. Dawkins cautioning us that
the topic of this particular chapter may or may not be
helpful to the reader; and if not, to leave it alone.

The next few pages introduce the concept of 'positive
feedback' into Mr. Dawkins' theory set; beginning with an
apt description of negative and positive feedback loops in

other venues. He uses the Watt engine regulator as an
example of practical negative feedback; with a further
example illustrating what a positive feedback Watt
regulator would do to an engine. We also get a rather
unique and colorful example of positive feedback looping
with the anecdote about one of Mr. Dawkins' schoolmasters!

Mr. Dawkins also illustrates that positive feedback loops
can have 'negative' results (just like negative feedback
loops can have 'positive' results), with yet another
colorful anecdote concerning a crowd of people who, while
anxiously awaiting a vote, responded to a chance fluxuation
in the general conversational noise level which was
somewhat quieter than usual--enough so that some people
noticed it. These people (expecting the results of the
vote) inferred from the noise-drop that the vote result
might be immenent, and quieted down themselves. This
increased (so to speak) the silence of the room, until very
quickly the entire room was engulfed in total silence.
Presently, people realized it had been a false alarm, some
laughs followed, and the noise built back up again to the
usual level. (I've had the same experience myself once!)
Something worth noting here (maybe Mr. Dawkins will bring
it up later), is that there had to be a characteristic of
the situation which invited this sort of response given the
proper conditions; in this case, everyone was anxiously
expecting a vote. In chemical and nuclear positive feedback
reactions, similar 'potentialities' exist prior to the
runaway reaction. At the top of page 199, we even get a
biblical example of positive feedback... of a sort, anyway:

"One of the best-known expressions of the idea of positive
feedback is in St. Matthew's Gospel: 'Unto everyone that
hath shall be given, and he shall have abundance: but from
him that hath not shall be taken away even that which he
hath.'"

He's quoted pretty fairly, and I have no overt problems
with his usage; but since (an answered prayer?) he's been
fairly straightforward in his material this chapter, I
thought I'd check the contexts just for kicks. Biblical
contexts can often be quite enlightening and even amusing,
so for me it's a fun hobby.

There are at least six places in the Gospels where we get
this phrase, or something rather like it. Matt 25:29 comes
at the end of the parable of the talents, one of Christ's

more unsettling parables (certainly no one will be likely
to build an explanation of wish-fulfillment for general
Christian belief out of material like this!) The lazy slave
with the one talent (the word refers to a measure of silver
worth 1000 standard units of the time, and worth much more
in buying power--though the English concept of 'talents' to
mean 'skills' works with the parable, too) didn't even put
his money safely in the bank so his master could have
earned interest. Accordingly, his talent is taken away and
given to one of the succesful speculators, and the slave is
ejected from the city to Gehenna (the garbage pit outside
Jerusalem which was burned regularly--making it a very apt,
and frequently used, metaphor for hell.) The moral of the
story is recorded as Mr. Dawkins has related the verse;
with the implication that "those who have", have what they
have largely as a result of what they've done. In essence,
the context of the verse with the rest of the story means:
"Those who have done well with what they were given shall
be given more; those who have done poorly with what they
have shall be rejected." It's worth noting that the second
slave wasn't entrusted with as many talents as the first,
and so wasn't able to accomplish as much; but he did what
he could, and was praised with the _exact same praise_
given to the man who presented ten talents. And the master
makes it clear that he would have been satisfied had the
man with one talent even bothered to put it into the bank
for interest; the third slave tried to excuse himself with
the observation that his master was a hard man (and thus,
he was afraid to speculate with the money.) But there was,
after all, a fairly safe thing he _could_ have done, with
no effort on his part (as opposed to the first and second
slaves) which would have prevented his rejection--so he has
no real excuse. The same story appears (with different
terminology for a different reading audience, the different
detail that all the slaves got the same starting amount, no
mention of the fate of the lazy slave, and an added
rebellion attempt which is punished by death--basically a
miniparable in itself) in Luke 19:11-27. A short saying in
John 15:2 makes the same basic point as the parable of the
talents.

I bring this up because, taken out of context, that
particular phrase can look rather unfair. Mr. Dawkins
doesn't make that charge, of course; but I didn't want the
reader to draw the wrong conclusion about it from seeing it
separated from its story.

One of the other three occurrences of the phrase I could
find appears as part of another 'hard saying' of Jesus, in
Matthew 13:10-17 (v 12 being the quoted phrase.) Here,
Jesus is explaining to his disciples why he tends to teach
in parables, and why he occasionally explains them to his
disciples (but not to the crowds). In this case, the phrase
redeems the rest of the explanation from its seeming
arbitrariness; the implication being that those who are
willing to hear of the kingdom of heaven shall come to
understand the parables, whether they ever hear the
'proper' explanation or not--and meanwhile, those who are
not willing to understand the kingdom will be left in the
dark. This hard saying is connected with several other
parables wherein the good sometimes get treated less than
they deserve (and the bad, better than they deserve)
because they grow up intertwined with one another, but all
will be set right in the end.

The remaining two occurrences are in Mark 4:25 and Luke
8:18, and they have a rather amusing context--combined with
the context of this book! Jesus is speaking (parabolically)
of how the truth shall (and should) eventually come out;
but that the listener who hears things without bothering to
sort them out himself to the best of his ability has only
himself to blame for the aggregating errors which will
follow. Luke 8:18, New American Standard Version:
"Therefore [said Jesus] take care of how you listen; for
whoever has, to him shall more be given; and whoever does
not have, even what he thinks [or seems] he has shall be
taken away from him." Mark's version says basically the
same thing, with the additional warning that "By what
measure you measure it shall be measured to you; and more
shall be given you besides." Taken after the warning "Take
care what you listen to", and before the conclusion "For
whoever has, to him shall more be given... [etc.]", this
gives us a nice feedback loop condition!

It goes like this: good sense leads to more good sense, and
errors lead to further errors. You should take care what
you listen to because of this fact; and be aware that if
you fall into folly because you just didn't want to bother
trying to work it out yourself to the best of your ability,
you'll be held accountable. (As the reader can see, this
links up nicely to the parable(s) of the talents, too!) I
myself would apply it to TBW in the following fashion:
nonsense early in the book, as I've shown, leads to
nonsense later in the book, cascading on itself as new

errors are generated by the faulty foundations upon which
they're built. But that's not all; you should note that one
of my favorite tactics is to apply the implications of Mr.
Dawkins' own positions back on Mr. Dawkins himself. (This
is the rather commonsense system check for self-
consistency; making sure that the positions taken don't
self-contradict themselves or refute earlier/later
positions in the argument.) By what standard Mr. Dawkins
measures, do I measure him; if he claims on one page that
the property of non-intentionality gets transfered right up
the chain from atomic matter to beavers making dams, then
it's well-worth asking why he insists humans are rational
and can act. Or, more colorfully, if he insists bats are
unconcious, automatic biological entities, why is he ready
to get worked up (beforehand!) about lobsters being boiled
alive? Perhaps he can get around such observations; but
simply ignoring the issue of the disparities leaves big
holes in the argument! And, really, there are times when no
amount of explanation is likely to help--requiring that
creativity really exist, but really be something distinct
from creativity, for instance; or (still my favorite so far
in TBW) asserting within virtually the same breath that
certain entities have "utmost complexity" and yet are "far
too simple" to require something! (In this case, the
'something' is Creation, but it doesn't really matter what
the subject is.) No amount of explanation can _really_
defend a dedicated 6=16 paradigm. The best that could be
done would be to explain that it's really a 6=6 or 16=16
paradigm; but that requires, necessarily, giving up the
properties of one of the two numbers. We can't have it both
ways.

Fortunately, Chapter 8 so far is refreshingly free of such
attempts! (Am I the only reader who gets the impression
that Mr. Dawkins tends to get more mellow when he's not
trying to deal with the opposition? Well, I can certainly
sympathize with that tendency.)

Mr. Dawkins forthwith launches into the main point of
Chapter 8: the discussion of how sexual selection tends to
reflect positive feedback loops. He also very charitably
gives strong credit to a contributor and former student of
his, Alan Grafen, as well as mathematical biologist Russell
Lande.

On p 200 we learn how Charles Darwin, though he was chiefly
concerned with how natural selection in terms of _survival_

works, still recognized the importance of natural selection in terms of... well, of _selection_! His very commonsensical observation was that one gender of a species could develop in such a way that, though hardly fit for _survival_ (per se), it was extremely fit to attract members of the opposite sex. I take it that the reasons males of a given species end up going this route rather than females, are:

a.) the female typically carries--and may care for--the offspring, and so must be proficient at surviving longer on average; and

b.) males tend to already be bigger, stronger, or otherwise more capable at surviving and so have some leeway for developing hampering--but highly attractive--features.

I expect that this latter issue involves yet another arms-race-style development cycle, insofar as among a population of equally attractive males, a mutant equally attractive yet more adapt at surviving might have enough of an advantage to eventually flood the gene pool, and vice versa. In that fashion, over time, attractiveness and competence might both progress (with perhaps a little see-sawing back and forth) in one gender.

Amusingly (though I'm certain, very true-to-life), Mr. Dawkins reports that the female whims which serve as the anchor-point for this process were often regarded as not being something fit to base a scientific theory on (because they were 'female' whims!) But R. A. Fisher managed to finally rescue the theory in 1930 by treating female preference as something which also develops dynamically within the whole order of the species (the arms-race concept again, except applied male/female instead of hunter/prey or attractive/competent.)

We do, however, get a bit of a potential problem, very similar to earlier statements of the same sort:

p 201, "Female preference is a manifestation of the female nervous system. The female nervous system develops under the influence of her genes, and its attributes are therefore likely to have been influenced by selection over past generations."

The question once more is, 'Is this _all_ that's going on?'
That is, this may be all that's going on in most animals,
but is this all that's going on in _humans_, too? Yes, or
no, the answer either way has rather serious implications
which should not be discounted. By this time, you should
already be familiar with the sort of issues I mean: did you
(or if you're male, your wife) pick a husband based _soley_
on what amounts to an irrationally conditioned impulse or
set of impulses? If so, are you ready to deal with the
consequences of this belief (assuming you can actually
perceive and evaluate necessary consequences, and not
merely be reacting again to some sort of physical stimuli)?
If not--if a conscious decision on your (or your wife's)
part contributed to the marriage--then we're not getting
the whole story yet from Mr. Dawkins, and we need to be on
the lookout for it (and perhaps we need to wonder at its
absence if he doesn't get around to it.)

A love which is something more than purely emotional
affection (however strong it may be) is certainly given
high regard in any society which recognizes that such a
thing can happen. If we look at cultures where this seems
not to be the case, I think we will find that the culture
tends to deny that something 'more' than pure emotion is at
work; I think we rarely, if ever, find cultures advocating
that a conscious decision to love your mate is a _shameful_
thing! But the real question is, 'Can we actually
contribute a conscious act of love to the emotions we
feel?' Such an ability not only seems to be universally
regarded (by societies that acknowledge its existence) as
meritorious, but also has positive practical effects:
emotions tend to wax and wane, and if the relationship is
built soley (or even primarily) on emotions, the
relationship will fracture quickly. A conscious act,
enacted continuously, to apply generally recognized
principles of justice, mercy and charity to one's mate,
even if the emotions aren't quite in line from moment to
moment, tends to carry marriages through the emotional
droughts. The results to individuals and to societies when
this _act_ of loving a spouse is absent from the
relationship, are becoming more and more apparent in our
society.

But if there really is _nothing more_ than genetically
induced affections to certain types, then the dissolution
of society from fractured homes becomes an inevitable (and
morally uncondemnable) eventuality. Evolutionistically, we

could probably speculate that a new mutant variation within
the species which increased emotional instability just a
hair's-breadth more than it already was (and the increase
must have been fairly small, because history of all
cultures essentially tells us that marital _emotions_ have
always tended to be rather fickle) has caused an
'explosion' or 'spiral' or positive feedback loop--like the
sort Mr. Dawkins is now explaining! This feather on the
camel's back meant that the mutant variant tended to spread
itself out more efficiently through the gene pool (its
carrier is impelled to mate with as wide a number of
individuals as possible). The fact that such an increasing
process leads to widespread inefficiency in human society
(we cannot speak of objective morals in such a process, of
course, because evolutionistically any impression of
'morals' we have is merely a product of a huge mix of
environmental factors, themselves non-moral) is not really
a problem for the theory, evolutionistically speaking; the
African long-tailed widow birds Mr. Dawkins uses as his
example for this process aren't dying as a species.
Individual birds (the males in this case) are rather
inconvenienced, of course, but the species is still going
strong. Accidental mutations have only resulted in the bird
species switching one kind of efficiency (flight ability)
for another (reproductive popularity). The human theory
I've proposed would mean about the same thing; even if it's
hard on the individuals involved, no one's at fault.

Of course, if you happen to think that in some instance
with which you're familiar, someone _really_ did do
something _wrong_ by abandoning a spouse when the emotions
fluxed--that they had a real choice whether or not to stick
with their mate, and that they 'should' have done so--then
you've tacitly rejected a strictly evolutionistic
explanation; and you've probably abandoned a naturalistic
viewpoint as well. Either that, or you'll have to be
willing to assert that morality really is real, but it's
nevertheless really something else (6=16 again!) It's
rather hard to explain why, when we make moral judgments,
we generally agree (unless we're overcome by emotion
ourselves) that an aberrent behavior produced by something
other than the defendant's free choice is not something for
which the defendant is really culpable--and yet
simultaneously maintain that _our_ ideas of morality must
all be ultimately traceable to ultimately nonrational,
nonmoral physical processes. Please note that I'm not
recoursing to a particular ethical code, or even a specific

belief-system here. I'm merely going with the logical math.
This sort of conclusion does tend to pare down the belief-
systems likely to be true (whichever way you judge the
issue), but I don't have to be a Christian to advocate this
point. Be that as it may, Christianity _does_ line up with
this point; so it's one part of an argument that
Christianity is true.

Mr. Dawkins hasn't brought any of these issues up yet (not
by the top of p 201 anyway), but I thought the comment I
quoted made for a good time to introduce and/or remind you,
the reader, of the implications of some of the ideas
involved. Strictly speaking, the process Mr. Dawkins
describes may very well be true (I suspect it's entirely
true for birds and other animals), and I'm certainly
willing to agree it influences human behavior as well. The
question is, 'If true, _how much_ does it affect human
behavior and what are the consequences of that conclusion?'
Are we ready to relegate human behavior _totally_ to the
same factors which make up, for instance, sexual selection
in the African long-tailed widow bird? Let me use Mr.
Dawkins' widow-bird example to work out the math:

p 201, What are the only sorts of factors mentioned for the
male? "It is safe to assume that tail length would have
been governed by a large number of genes, each one of small
effect, their effects adding up, together with the effects
of diet and other environmental variables, to make the
actual tail length of an individual."

So the males do not really choose their mates. How about
the females? Mr. Dawkins says _they_ "choose" their mates,
but he's speaking purely figuratively, as he makes clear on
p 202:

"[W]e regard female preference as a genetically influenced
variable **just like any other.** Female preference is a
quantitative [note: _not_ 'qualitative'] variable, and
we can assume it is under the control of the polygenes in
just the same way as tail length itself." [italics mine]

Now, most of us agree that this sort of thing goes on in
humans, too. That, in and of itself, is not a problem. The
question is whether anything _else_ is _also_ taking place,
above and beyond the physical; and if so, what implications
that has. But if there is nothing _except_ the physical,
then the picture being painted by Mr. Dawkins means that

these behaviors are not rational ones. They may be
effective at spreading genes through the gene pool; but the
behaviors themselves are irrational.

Again, on the face of it, this is not a problem. That is,
it may be disconcerting and annoying to learn (or suspect)
that our mates did not _really_ 'choose' us, and we
ourselves were under some sort of illusion that we had some
sort of choice concerning our relationship with our mates.
But if that's the way it is, then that's the way it is--we
must take reality as it comes to us. Still, there are at
least three problems with this line of reasoning.

First, there's the curious fact (and it is a fact, a bit of
data that must be accounted for in some fashion), that if
our experiences of choosing a mate are illusory (that is,
we have some kind of 'sensation' that we've actively
'chosen' a mate, but it was actually completely a set of
physical reactions in our bodies over which we had no
control) we nevertheless can apparently recognize it (or at
least form a theory of it) _as_ an illusion. This is _so_
odd, that people often completely overlook the problem
here: how did we get the idea that it was an illusion?

Let me make this clearer by giving an example. I walk up to
you, hand you a glass of water with a piece of ice floating
in it, and ask you, 'Is this an iceberg?' What would you
answer? Well, an iceberg _is_ a piece of ice floating in
the water, but the iceberg has at least one characteristic
which the icecube you're holding in the glass can't
possibly have: it's massive! (The word literally means
'ice-mountain' in German.) This is a quantitative
difference, but we treat it for convenience _as if_ it were
qualitative, so we can have a meaningful discussion about
icebergs vs. icecubes. But the point is this: if you had no
idea what an iceberg was, what possible answer could you
give me? Assuming you decide not to dishonestly bluff, your
only answer would be 'I don't know.' (And, perhaps, you'd
continue with a rejoinder--what _is_ an iceberg?) If you
had some idea what an iceberg _is_, you'd know that _this_
is not an iceberg. Or you might decide to argue that it is,
after all, an iceberg; but you'd still have to have some
idea (even if mistaken) about what an iceberg is, to work
with.

The same goes with illusions. People unused to desert
travel can sometimes be fooled by a mirage. Once they know

what a mirage _is_ (an illusion one can expect under those
circumstances), then they can distinguish between the two
categories: a 'real' oasis, and a mere sensory impression
of an oasis. They needn't be able to constantly distinguish
the two in practice; they needn't go near a desert at all
to understand the concept. But it's necessary to know
certain characteristics about what _is_, and what _seems to
be_, to tell the difference between the two. If someone
maintains that what we call 'love' is actually _purely_ a
set of biophysical/biochemical reactions, then this is
being set up in opposition to something else. How did we
get that idea of 'something else' to set it up in
opposition to? We know a desert mirage is not an oasis,
because we know what an oasis _is_, and we know what a
mirage _is_. Indeed, I think the vast majority (perhaps
all?) of the illusions we meet in real life require
something real upon which they are based. The desert mirage
exists because there really _is_ an oasis at location 'A'
reflecting sunlight; and the reflection is being refracted
through the heated desert atmosphere to make it seem as
though the oasis (or another one like it) exists at
location 'B'. When I hallucinated that a rattlesnake jumped
at me from a ceiling fan years ago, while I had the flu, my
mind could present that image to me because I have seen and
read about real rattlesnakes.

'Well then,' the sceptical reader may snort. 'I suppose you
think unicorns actually exist, since you can form a
conception of them!' As it happens, there is apparently a
rare genetic defect in certain breeds of goat which results
in an individual's horns growing together fused. Ancient
depictions of unicorns show clearly the goat-like (as
opposed to horse-like) features: notably, cloven hoofs,
delicate grace, and beards on the males. But leaving that
aside (though I myself was quite surprised to see such a
creature!), the answer would still be that the Argument
from Disparity of Illusion requires, by default, that the
object in question actually be illusory. What I'm pointing
out is that _even if_ our mating habits are purely
irrational, we can form a conception of disparity on the
subject. The question is what, in this particular case,
could we have in our experience from which we derived so
basic an illusion? It turns out that unicorns have an
objective reality of a sort, not terribly different (any
magical abilities aside) from what the concept of 'unicorn'
was in ancient times. Gryphons may be utterly fictitious,
but eagles and lions are not. But we're discussing

something far more fundamental and abstract than eagles, lions, or unihorned goats. Let's rework the question a bit: is a free choice, _added to_ all the other nonrational physical effects, something which is compatible, logically, with the actual implications of evolutionary theory? And if not, are we excluding it because we have no real evidence it exists; or are we only excluding it because it doesn't fit evolutionary theory?

Second: (yes, there's a second point, remember? I hadn't gotten to it yet!) We should ask ourselves, even if human mating practices are entirely based on nonrational physical effects, how far we can take such a concept? One thing should, by this time in my book, be abundantly clear to you: we can't take this concept all the way up to the fundamental principles of our own reasoning. If we do, we undercut the validity of our own theories, including any theory we might make about human mating practices (or African widow-bird mating practices, for that matter!) So there's one place we all agree (whether implicitly or explicitly) that nonrational physical causation is _not_ the sum total of a particular human behavior: our own individual, particular theories about reality! And this is the realization which, I think, sets off a sort of positive feedback loop in philosophy! Because, once that idea is recognized, a whole avalanche of consequences follows. You should be able to piece together quite a few of those consequences in my book, though (by the 'nature' of its composition, so to speak!) SMB isn't a systematic apologetic. But in this case, one of the consequences is that an arbitrary exclusion of choice in human mating practices (assuming anyone out there is actually advocating this--Mr. Dawkins himself isn't exactly doing that yet) suddenly looks even _more_ arbitrary! We'd probably have to have quite a bit of evidence to conclude that it _never_ happens (although we could always still conclude that it might, and probably does, happen on some particular occasions.)

Third: we can't (or, at least, we shouldn't) try to get around the problem by asserting that pure biophysical/biochemical reactions and counterreactions are 'really' the same thing as our actions of love. For whatever reason, we humans have a virtually universal conception of love (if we think of 'love' at all) as something _we_, ourselves, can actually _do_. We _also_ recognize that feelings of love happen _to_ us, and that we

'are loved'; but we generally distinguish between these
three things. If we can add something _to_ natural process,
this at least looks very much like a definitive example of
supernatural activity; if we only ride the wave of natural
activity, then we are not adding something to the process
ourselves--the processes are, at best, taking place through
us. Feelings of infatuation and affection certainly happen
to us; human males are wired such that we have certain
preferences in physical female shape (these preferences,
being partly dependant on social pressures, change over
time and across societies); and most humans appear to be
wired so that we automatically feel something 'protective'
when we see babyish features, even if the features are in
another species. (Children's artists regularly make even
snakes and lizards 'cute' by importing babyish mammalian
features into their drawings; come to think of it, some
baby reptiles really _do_ look that way. 'Awww, Mommy! That
little alligator looks so _cuuute_! Can we take it home as
a pet?') These are feelings which are automatically
happening to us; what we _do_ about those feelings (or with
them, or around them, or despite them) is another thing
altogether. The happiest and most ethically 'good' marriage
in the world (whatever "ethically 'good'" means) features
quite a few automatic feelings which also cluster around
rape and adultery. This has led some secular materialists
to conclude that marriage is only socially acceptable rape
and/or adultery; and (to be fair) has occasionally led some
otherwise well-meaning theists (Christians included) to
conclude, despite the Scriptures we largely share, much the
same thing. But in practice, we distinguish between the two
concepts. What we _do_ about the feelings makes the
difference; and even the most rigorously materialistic
sexual psychologist would probably agree that _if_ we
'could do' something about the feelings it would make a
difference, which is why (under his theory) we tell
ourselves that we can.

At any rate, as I've pointed out in other topics earlier in
my book, it's an illegitimate logical move to attribute
real distinctions to concepts and simultaneously deny that
they are really different things. If reactions and actions
are really the same thing, they are not really different
things--at best they are different ways of _perceiving_ the
same thing. And if they are the same thing, then
attributing different _real_ properties to them cannot be
logically accomplished. Similarly, if they are really
different things, they cannot be functionally equated. Any

theory which requires 6=16 should at least be extremely
suspect, if not outright rejected as possible (much less
plausible.)

(Footnote: a possible fourth point might be drawn from the
historical fact that in several societies at several widely
spaced intervals of history marriages have been overtly
conscious--sometimes ruthlessly conscious--events. However,
I have not bothered to try including an argument on this
ground, as I'm unsure whether it would be comparing apples
with apples. One possibly reasonable response might be that
such marriages are purely social artifacts, and that the
adulteries and prostitutions in such societies might be
closer to 'real' natural matings, and thus follow proper
evolutionary procedure in a fairly easily traceable
fashion. However, such a counterreply would leave open the
serious problem that it seems to tacitly agree that the
purely social artifacts are "artificial", not natural; and
that opens a whole other can of worms.)

Setting aside this inherent problem submarining under Mr.
Dawkins' theory (even in a chapter relatively unconcerned
with battling supernaturalism as this 8th Chapter), pp 202-
204 provide a good description of how these processes work
in African widow-birds (at least). _This_ is the sort of
thing Mr. Dawkins is really good at, and if I had to
lecture on the face-value theories being presented here,
I'd refer my audience to this chapter! (Heck, I'd probably
just crib straight from it and give him the credit!)

One of the things he reminds us is that the genes for one
gender's preferences are carried latently in the _other_
gender as well; so that, for instance, the female widow-
bird carries genes which in a _male_ (though not in a
female) would combine with the y-chromosome to produce long
tails in the male--as well as, of course, the genes which
make widow-bird females find long tales sexually
attractive. (It's probably safer to say that _some_ of the
genes expressed in the males are carried by the females,
since females have only x-chromosomes--they can't carry a
genetic structure unique to the y.) This means that both
genders end up reinforcing certain tendencies since they
both carry each other's tendencies latently (to at least
some degree.) The result is stated as follows:

p 203, "So, the genes for male qualities, and the genes for
making females prefer those qualities, will not be randomly

shuffled around the population, but will tend to be
shuffled around _together_." [italics his]

Come to think of it, this sort of tendency can also be seen
in blackjack. Because the rules of blackjack follow certain
standard guidelines, people who know the rules tend to
'stand' or 'take hits' in particular circumstances. As a
result, over time the 10s, Jacks, Queens, and Kings clump
together in the decks. That's what allows a blackjack
player to count cards, and thus reasonably guess (sometimes
correctly) when a clump of facecards is about to show up;
and this allows the player to make tactical choices about
how much to bet and/or whether to take certain hits or not.
Basically, it allows the player to transcend the math rules
normally imposed on all players, by recognizing and
applying a supervening category of math-rules which include
the 'lower' system, but which the lower system itself does
not exhaust. And since the house edge lies in the
subordinate system, a blackjack player can get around the
house edge--assuming, of course, that the casino personnel
don't take steps themselves outside the subordinate math to
foil the players. For instance, having a dealer 'wash in' a
new deck resets the table's clumping factors and destroys a
counter's ability to estimate the chances of a clump.

I once saw a man in Vegas, who was running a counting
system and who had managed to accumulate a huge stack of
mostly black ($100) chips and a few greens ($25). Then the
pit boss authorized a fresh set of cards on the table. I
mentioned at the time, to a nice young lady from France who
was touring America with her parents and who had stopped
behind me to watch, that if this guy didn't leave the table
now, he'd almost certainly be destroyed. Sure enough, not
fifteen minutes later, this fellow was reduced to a
somewhat smaller pile of green ($25) chips with some black
sprinkled in. I'm sure he heard me show off... er, explain
to the pretty young lady that he was about to be
annihilated if he didn't move; but I still felt bad for
him. (Meanwhile, I must say that I've never, before or
since, wished I was a native of France so badly!
Madamoiselle, thank you for brightening my day, and I pray
we'll meet again eventually; and your parents were
perfectly correct, casino gambling is extremely hazardous
even on blackjack!)

When blackjack casinos began popping up with increasing
frequency all over the United States, a vast number of

people with not much idea how to maximize their chances
with the cards (even within the subsystem, which most
players took to be the _only_ math system in operation)
suddenly flooded the casinos. The casino owners responded
with a strategic decision to milk the trend for as much as
it was worth, and they did this by issuing a decree that
the dealers spend as little time shuffling as possible.
This greatly increased the clumping effect; which greatly
increased the 'professional' player's ability to beat the
odds by using counting systems and something called
'shuffle tracking' (which I won't go into.) All of this was
perfectly legal, by the way. As far as the casinos were
concerned, they had no problem with an overwhelming
minority of players suddenly harvesting a bonanza off the
tables since the overwhelming _majority_ of players had
little idea how to minimize (much less transcend) the
built-in house edge. And of course, the casinos always had
their little ways of making sure the real players didn't
quite break the house--up to and including refusing to play
them. After a while, with so many books on the market on
how to 'beat' the casinos, it became more sensible to match
the increasing knowledge-base of the players, and casinos
went back to careful, meticulous (and more thoroughly
randomizing) shuffles; which, I'm sure, had the side-
benefit of really floofing some of the semi-pros who knew
just enough to be dangerous, but not enough to recognize
the warning signs!

Anyway... aside from a bit of gambling trivia you may not
have known about (and a moral about gambling which I hope
you heed), this is another example of clumping, similar in
some respects to what happens in gene-mixing over time.
(And also, perhaps, an example of genetic attraction!)

p 204, "These consequences [of linkage disequilibrium, or
'genetic clumping'] can only be proved mathematically, but
it is possible to say in words what they are, and we can
try to gain some flavour of the mathematical argument in
nonmathematical language. We still need our mental running
shoes, although actually climbing boots is a better
analogy. Each step in the argument is simple enough, but
there is a long series of steps up the mountain of
understanding, and if you miss any of the earlier steps you
unfortunately can't take the later ones."

No disagreements here; I just thought this was a 'cool' way
of putting the matter, and wanted to reprint it to call the

reader's attention to it. Sort of reminds me of Christian apologetics, actually; if I ever write a full-dress apologia, I may quote this particular paragraph fragment! Also, though I haven't read the book yet, I'd be willing to bet that Mr. Dawkins' _Climbing Mount Improbable_ title and theme stems from his idea behind this paragraph.

Sidenote to my Christian brethren (my atheist readers can probably skip this part--it's an internal issue): I am well aware that a saving faith in Christ does not require the understanding of a meticulous train of valid logic. Apologetics are a _tool_, not an end; conversely a relationship with God-through-Christ is the ultimate End, not a tool (indeed, if I saw a person using a 'relationship' with Him _primarily_ as a tool to some other end, I'd have strong presumptive grounds for doubting his real Christianity. Remember the parable of the sheep and goats...) But since an apologia is a system of logic, then by defaut if an early misstep is made, it makes it formally impossible to properly proceed to later stages. Tools have strengths and weaknesses, and this is the (potential) weakness apologetics share with any other system of logical analysis. Therefore, I do not consider a faulty train of reasoning grounds for necessarily doubting the relationship of a person to God; and I would not consider a perfect intellectual understanding of God grounds for necessarily accepting a person's professed relationship with God. ("So you believe in God? Good for you! Even the demons believe-- and shudder!") Nevertheless, if a clearer understanding of God can be even partly achieved by trying to discover the unity of an idea about Him, then as far as it goes I consider this a good thing. And for people who currently do not believe, and who may not recognize God working in their life, apologetics can help make that glass "through which we see now but darkly" somewhat less dark. What they _do_ with this new knowledge is another matter; that's where the saving grace comes in. I expect I'll have something more to say about this in one of my appendices.

Meanwhile, I think Mr. Dawkins does a good job on pp 204- 205 explaining the correlation between an accidental genetic pressure (female birds' aesthetic taste for 4" male tails) and utilitarian pressures (the aerodynamic fact that a 2" tailed male will have a better chance at surviving long enough to replicate) to produce a population of birds with 3" tails in the male. It all appears quite self- consistent to me, and concisely and cleverly written. At

least, biologically speaking it seems self-consistent.
There is one minor part which seems a tad jarring, all
things considered:

p 206, "It is at this point in the argument that the lack
of mathematical justification in my account [on Mr.
Dawkins' part, not on Lande's] becomes really noticeable. I
could invite the reader simply to accept that the
mathematical reasoning of Lande proves the point, and leave
it at that. This might be the wisest course for me to
pursue, but I shall have one try at explaining part of the
idea in words."

From this I get two (relatively minor) inconsistencies in
Mr. Dawkins' overall approach:

a.) Mr. Dawkins apparently agrees (at this point) that it
would be not only entirely excusable but maybe even "wise"
to simply ask us (the readers) to accept his word that,
even though he hasn't spelled the whole thing out for us
mathematically, Lande has done so. That is, even though
he'll take a stab at trying to work it out in nontechnical
language for us, he wouldn't consider it a serious flaw in
his arguments to have had to just say to us concerning a
technical matter, 'Trust me... or, rather, trust Lande...
it works.' Nor, apparently, would Mr. Dawkins consider us
fools for trusting Lande on his (Mr. Dawkins') word. Now,
though at this point Mr. Dawkins hasn't _quite_ come out
and called creationistic theists fools for trusting
technical authorities on religious subjects, he's come
pretty close and his tone (in his introduction to the 1996
edition of TBW, for instance) gives me a good feel for what
his opinion would be on the matter. The point is that I
don't get the impression that when _other_ experts are
speaking in _their_ fields (notably, theologians and
theistic philosophers), he'd cut us some slack in trusting
them when they have to necessarily refer back to theories
too complicated to present to people like us who aren't
trained sufficiently to criticise them.

Relatedly, when theologians criticise biology on biological
grounds, Mr. Dawkins seems competent enough to respond and
correct (as far as I can tell, at least.) Furthermore, when
theologians criticse biology on philosophical or religious
grounds, not only is Mr. Dawkins competent to call 'halt',
any of us should be leery and cautious about accepting the
theologians' results. But when theologians criticise

philosophy _masquerading as_ biology, then they're in their field, and Mr. Dawkins has no intrinsic advantage. He can still attempt to counterrespond to them, of course, and may even score some points; but it will be purely on his skill (which I myself have found seriously lacking so far in this arena). Furthermore, such an attempt (which he has in fact made numerous times already in TBW) presupposes that an expert in one field may have something true and useful to say in response to theories developed in another field-- otherwise Mr. Dawkins himself would not bother to criticise theism on occasion! As for myself, since the topic at this point in TBW really seems to be biology; and since I've found Mr. Dawkins to be so far relatively self-consistent with his biology (when he's not subordinating it to philosophical agendas at least); then I'm willing to accept his voucher for Lande's success in the same topic.

b.) Mr. Dawkins' attempt to go ahead and try to get Lande's mathematical conclusions into words is self-consciously qualified as being likely incomplete (due to the differences in modes of presentation--Lande's mathematical presentation would be complete, because it's a mathematical conclusion.) Nevertheless, Mr. Dawkins sees some possible benefit for us and our understanding of the biology in trying it this way. In other words, though he knows this way isn't the most accurate way, he believes we still might very well get true and useful information out of it. I'd be curious to know whether he'd allow the same leniency, as an extension of the general principle, to preachers trying to get complicated theological ideas across to an audience presumed (for convenience) to have roughly a 7th grade education. His general tendencies in this book so far don't give me much hope that he'd be willing to cut the audience some slack for believing sermons which, by their character, are incomplete restatements of more technical studies; or to cut the preachers some slack for delivering them; or even to cut the general spread of Christianity (and other theisms) some slack for this necessary means of trying to spread the gospel. At any rate, whether he would or not (and I agree it's uncharitible to assume he wouldn't), maybe you, the reader, will remember the point at some later date when it will be tempting to dismiss theism after hearing an inept sermon fragment.

Please note: I am _NOT_ dismissing naturalism based on Mr. Dawkins' extremely faulty presentation of it (assuming my arguments are valid, of course.) I'm saying that he's

showing himself incompetent to achieve at least one of his
stated goals: illustrating "Why The Evidence Of Evolution
Reveals A Universe Without Design." In the process, I'm
trying to use some of his missteps to illustrate some other
missteps shared (in more technical forms) by official
philosophic naturalists, which further allows me some room
for positive argumentation on the subject, and _thereby_
(perhaps) helping illustrate that God exists and has
certain characteristics. Simply pointing out Mr. Dawkins'
missteps, in and of themselves, doesn't (and wouldn't, and
couldn't) do the trick. (See my own last chapter for
further qualifications from me along these lines. I'm
trying hard not to claim more than I can deliver.)

Moving on to pp 206-207, we get an illustration of genetic
momentum in the 'green-beard' theory; the principle that if
a gene simultaneously happened to produce a conspicuous
physical trait (like a green beard) as well as wiring the
individual such that the individual felt helpful emotions
toward green-bearded individuals, then green-beards would
probably eventually dominate the gene pool. As Mr. Dawkins
notes, this is another example of W.D. Hamilton's
"important" theory of kin selection:

pp 206-207, "Hamilton... showed that natural selection
would favour genes for behaving altruistically towards
close kin, simply because copies of those self-same genes
had a high probability of being in the bodies of kin. [...]
The green-beard altruism gene would tend to be favoured by
natural selection, for exactly the same kinds of reason as
genes for altruism towards offspring or brothers."

My problem with this is _not_ that (as Mr. Dawkins admits)
"Nobody really believes, not even I, that the green-beard
effect, in this ultra-simple form, will ever be found in
nature." [p 207] After all, Mr. Dawkins already shows he
believes that a more complicated version of the same theory
is true about his feelings of altruism towards his kin
(brothers, sisters, parents, children, whatever)--enough so
that he "discussed it at length in _The Selfish Gene_" (an
earlier book.) That is, he claims that his feelings about
these people are not really his choice, nor meritorious in
and of themselves. They are not really facts about him, as
a conscious, responsible person; they are only physical
facts about his genes. And we are told quite explicitly
near the bottom of p 207 to:

"[r]emember, by the way, that there is no suggestion here
that genes 'want' to help copies of themselves. It is just
that any gene that happens to have the _effect_ of helping
copies of itself will tend, willy nilly, to become more
numerous in the population." [italics his]

Well, of course, I'm lampooning a bit (though if any of Mr.
Dawkins' kin have noticed some odd behavior in his
relationship with them, this might perhaps explain it!) Mr.
Dawkins doesn't come out and _say_ that this is what he
believes about himself; but it is a rather inescapable
implication of his theory--unless he intends to add
something above and beyond this later to offset it.
(Hindsight note: he doesn't.) The problem is not so much
that the theory is inconsistent or has bad facts, in and of
itself--I suspect it's very accurate regarding the birds
and other animals and genetic processes in general
(including ours, to at least some degree). The problem is
that Mr. Dawkins himself doesn't appear to believe that his
opinions about lobsters, thalycids, racist bias, etc.,
etc., are _only_ an objective fact about his particular
body, and _not_ an objective fact (or even an honest guess)
about real independent right and wrong behavior. On the
contrary, he apparently thinks that his opinions on these
and other matters covered earlier (up to and including his
own theories on biology, philosophy, etc.) are not _only_
physical facts about his body which he's just happening to
exhibit. In _those_ instances, he apparently believes that
something else is at work; and in fact, for those instances
to even have a chance at being what he claims they are,
something else must be accounted for. We haven't seen it
yet in TBW.

Consequently, all indications from his theory so far (as
opposed to his practice), imply that the 'real' meaning
behind his own opinions and theories is only a sort of
mirage; something he happens to be conditioned to exhibit
by micro- and macro-environmental processes. You'll have
noticed that there's no leeway given in his restatement of
his Oxford collegue Hamilton's theory about the source for
altruism between kin. I ask you, the reader: what do _you_
think the necessary implications are here? And do they
really fit with what Mr. Dawkins knows or claims to know?

Meanwhile, on p 208, Mr. Dawkins points out (correctly, I
think), that the theory doesn't require an accounting for
what made some female widow-birds prefer longer tail-

lengths to begin with; once an accidental edge is gained
(through random mutation, I presume), then the
characteristics of what we may call the widow-bird society
self-reinforce a chain reaction--at least up to the point
where the males can no longer fly straight (which forms the
new constraint for development.) This balancing series of
constraints is described by Mr. Dawkins starting at the
bottom of p 208 (where we find ourselves "Laceing our
climbing boots even more securely").

My only caveat about this section is that he introduces the
term "choice discrepancy" in the same paragraph to describe
the tension between the two constraints (genetic female
aesthetic taste vs. physical male ability to fly.) What
bothers me about this is that I consider it a potentially
muddying phrase; Mr. Dawkins has already made it clear,
biologically, that we're not actually dealing with _choice_
in the widow-birds. I want to make sure that we're not
seeing the beginning of another 6=16 paradigm here, where
he eventually asserts that choices really do exist, but
they're really something other than choices. 'Taste
discrepency' would seem a safer description, and less open
to fudging.

p 209, "[W]henever a female **chooses** a male of the type
she 'likes', she is, because of the non-random association
of genes, choosing copies of the very genes that **made
her** do the choosing." [italics mine]

Here we see an example of what I just mentioned: the female
chooses a male, but the genes made her choose that male. In
other words, either we're only speaking for convenience
about her ability to choose; or he's asserting that real
choosing exists, but is really something other than
choosing (since genes are nonrational biomechanical
entities.) For that matter, unless the widow-birds in
question are somehow different from the bats, beavers and
driver ants, they are _also_ nonrational biomechanical
entities. So what does Mr. Dawkins mean by "choosing"? At
least he doesn't develop anything philosophical from this;
but I warn the reader that we are seeing the 6=16 paradigm
again.

At any rate, I found Mr. Dawkins' explanation of Lande's
theory (and the consequent justification of Fisher, 50
years earlier) to be fairly well put, colorful, and even
self-consciously critical. For example, Mr. Dawkins notes

in a couple of places that the Lande/Fisher theory may not
accurately reflect real-life situations, and even that "one
of the leading authorities on the theory of sexual
selection", Peter O'Donald, suspects that the theory may
have accidentally included its conclusion as a necessary
premise:

p 212, "[O'Donald suggests that] the runaway property of
the Lande model is 'built into' its starting assumptions,
in such a way that it couldn't help emerging in a rather
boring way at the other end of the mathematical reasoning."

Setting aside the irony of this comment's inclusion in TBW,
I note that Mr. Dawkins even includes a plausible
alternative theory from scientists such as Alan Grafen and
W.D. Hamilton, wherein the plumage of males provides a
healthy signal to females that the male is parasite
resistant. This theory combines elements of positive
feedback development loops, the balancing equilibria line
(described by Mr. Dawkins mostly on pp 210-211), and a
competitive arms-race development factor (between the birds
and the parasites). Though Mr. Dawkins agrees this is a
plausible alternative theory, he (rightly) notes that he's
going to stick with the female aesthetic preference theory
for this chapter, as it makes for a cleaner example of
evolutionary explosions.

Mr. Dawkins next details (pp 213-214) a clever experiment
by Swedish scientist Malte Andersson, which produced
results compatible with the hypothesis that the preference
of female widow-birds for long tails is more extreme than
the actual average length of widow-bird tails.
Specifically, Andersson tested the results of male widow-
birds' ability to keep harems in their territory (i.e.,
Andersson counted the nests in the territory) after having
their tails altered. Nine birds had their tails
artificially shortened; nine birds had their tails
artificially lengthened (with real widow-bird feathers--
from the unfortunate first group!--and superglue); nine
birds had their feathers cut off and glued back on (to test
whether superglue presence was a factor in the experiment);
and nine birds were left alone for purposes of comparison.
Sure enough, the birds with the longer tails ended up with
more nests in their territory (i.e., were more successful
getting mates) than the birds with snipped tails; and the
two intermediate groups (the ones whose tail-lengths stayed

the same, superglue or otherwise) had (as per hypothesis) intermediate results.

Mr. Dawkins notes fairly that to check the other side of the experiment, Andersson should have followed (if possible) the careers of the male birds, since (also per hypothesis) the snipped birds should have had longer lives than their longer-tailed brethren. But he also fairly notes that had Andersson tried this, it might be inconclusive. Per the hypothesis, the cost of growing the longer tail might only be the biological resource cost of growing it, not of keeping it--that is, actually having a longer tail might not make the males more susceptible to predators (or more likely to have crippling/fatal accidents). If that were so, tracing the adventures of the snipped/extended widowbirds could prove useless, as the adults might already be past the point where having genes for long tails is a liability.

p 216, "[T]he essence of the Fisher/Lande theory is the 'green beard'-like phenomenon whereby genes for female choice automatically tend to choose copies of _themselves_, a process with an automatic tendency to go explosive." [italics his]

Again, 'choice' is presented as being something other than choice. Remember, the genes are not _really_ 'choosing'; they are reacting with their environment in such a way as to create macroscale entities (our bodies). If the physical properties of these bodies are such that they replicate efficiently, then the genes which produced the bodies get spread through the gene pool. There is no 'choice' involved in this process; that's a term which Mr. Dawkins must be using for convenience, unless he wishes to contradict his own numerous assertions that the behaviour of microscale particles are "blind" and nonrational (as he says here, "automatic".) And the females are apparently not choosing, either; they are reacting to genetic impulses which happen to have such-n-such results. This is right before he intends to look at possible analogies in human "cultural evolution" (which, as he points out, aren't really examples of evolution, but sometimes behave similarly. Actually, I half-expected him to claim that human cultural evolution is really evolution, but is really something other than evolution!)

On the next few pages, Mr. Dawkins describes how what is
labelled as human cultural evolution dovetails with
biological evolutionary theory; particularly in the
existence of trends and most particularly in the existence
of definably objective progression in trends. So, for
instance, it is objectively true that transportation has
become more efficient; sound and picture reproduction has
become more efficient; and the machines we use for killing
can kill more people faster. He carefully distinguishes the
word "improvement" to what he calls a "neutral" definition
[p 216]. In fact, he goes to some length to illustrate that
these need not be qualitative improvements. I foresee two
problems here, one of them serious (and which I've touched
on already numerous times.)

1.) Mr. Dawkins suggests that though objective quantitative
progress has been made, it is arguable that qualitative
progress might not have been. This is a rather ephemeral
suggestion, though; if the physical universe is all that
exists, what can he be talking about? It's all very vague
at this point: "I don't mean to say that the quality of
life has improved as a result of these changes; personally
I often doubt it." Does he mean something subjective and
aesthetic? He might: he states that sometimes he thinks the
world would be a _more agreeable_ place without amplifiers,
which I take to mean that _he_ finds music too loud
sometimes. His suggestion that the quality of what's being
shown on television may not be an improvement on the
original fare could also be taken as subjective. If so,
then the question of whether qualifiable improvements are
possible is illusory; he may only be saying that he himself
happens not to agree, taste-wise, with the state of things.
But he certainly treats the problem _as if_ it could be
considered objectively. This is particularly true in his
last example, which brings us to the second problem.

2.) [p 217] "The quality of machines for killing in war
shows a dramatic trend towards improvement--they are
capable of killing more people faster as the years go by.
The sense in which this is not an improvement is too
obvious to labour."

I think, however, we'd better "labour" at it a bit. How is
it too obvious that this is not an improvement? In what
sense? Let me be more specific: in what _physical, natural_
sense can this be regarded as certainly, objectively not an
improvement? (Mr. Dawkins apparently believes that this

lack of improvement in this unstated 'sense' is _self-
evidently_ true--"too obvious to labour.") Because it's
unnatural to kill other humans? If killing other humans is
unnatural, he'd be offering testimony that nature is not
the only reality; if killing other humans _is_ natural,
then not only would it not be an _improvement_ in a
qualitative sense, it would also not be a qualitative
degradation--it would be a neutral observation.

Perhaps, then, he means that he's already explained that
this is not an improvement because at the same time
technologies preventing people from being killed are also
advancing, and that he's already described this point so
thoroughly that it would be a waste of his time to
illustrate it for us again. That might be defensible; it
would be more defensible if the actual facts were in
accordance with that theory, to the extent that it was
self-evident. But in fact, we find that (as the old
military saying goes) in the war between the shell and the
armor, the shell always wins in the end. It is manifestly
self-evident that human technology for protecting people
from weapons is _not_ keeping track with our general
ability to kill each other (though admittedly in some
limited areas, such as aircraft missle/countermeasure
designs, there's something like parity of development.) I
submit, then, that though this is a possible interpretation
of Mr. Dawkins' remark, a far more plausible option
remains--one which has the advantage of dovetailing cleanly
with some of his previously stated opinions.

I think Mr. Dawkins means that the sense in which
efficiency in killing is not an improvement, a sense "too
obvious to labour", is an _ethical_ sense. He thinks it's a
tragedy that men should kill (or be forced to defend
themselves by killing) other men, and therefore the
increase in our efficiency in this regard is manifestly not
an improvement. I agree, of course; but I see no objective
physical reason why this should be so. That is, I see no
reason that fits in cleanly with Mr. Dawkins' philosophical
naturalism. He could mean:

a.) He himself finds the thought of increased efficiency in
killing aesthetically distasteful. That would be in keeping
with his naturalism; but it would be hardly "too obvious to
labour". On the contrary, we may pretty surely believe that
there are a rather large number of people somewhere for
whom the aesthetic distaste for killing other men is not a

particularly daunting or obvious problem--otherwise, we
wouldn't keep developing more and more efficient means of
doing just that! Of course, he could also mean that he's
already made it pretty clear previously in TBW that he
happens not to like men killing other men, and that his
aesthetic preference should thus already be self-evident to
us (if we've been paying attention.) If he means this, then
I would agree that it is not an objective improvement for
Mr. Dawkins to be a little more disgusted; but then again,
it is not really a detriment, either (except to Mr.
Dawkins' taste). Given that there really is an objective
physical improvement (we _can_ in fact kill more
efficiently), I would have to reply that as far as 'real'
improvements go, all we have are real improvements in
killing--the distaste Mr. Dawkins and I feel at the thought
of this concept may be objectively real as a physical
sensation, perhaps, but it doesn't 'mean' anything beyond
that in terms of humanity's killing efficiency.

b.) He could mean that we are instinctively wired to react
with disgust at the thought of killing other people. But
this turns out to have the same problem as option a., with
a bit more background explanation; as far as those genetic
impulses go (like disgust for killing), there must be at
least as many, if not more, impulses to go on killing, or
we wouldn't keep improving our efficiency in that respect.
So such things are mainly facts about us, and mean nothing
above those facts. That is, if in this case I requested the
Serbs and Albanians to stop killing one another, my
actual grounds for doing so would be something like "Gag!
That's disgusting! Please stop offending me!" If they ask
why I should think they'd stop their ethnic slaughter for
the sake of _my_ tender nerves, my _actual_ grounds (in
this case) would be: "Well, I'm genetically wired to be
disgusted at killing." I think their reply would amount to
(on the same grounds), "Well, we're not." (And then they'd
probably shoot me to keep me from contaminating the gene
pool!)

c.) He could mean that it's "too obvious to labour" that
we've all been trained, as Western Civilized Men, in a code
of conduct which encourages us to regard such things with
distaste. This has the same problem as b., as long as we're
talking only about our own distates, plus the added problem
that as far as Mr. Dawkins is concerned the actual
ground(s) upon which this code of Western Civilized conduct
has been based (the existence of some sort of supernatural

Guarantor for objective morality) is "gloriously, utterly wrong"! By his own testimony then, he cannot expect such a code to provide real grounds for a positive conclusion that an increase in killing efficiency is a tragedy (or even that an increase in killing efficiency must _not_ be an improvement.)

d.) He could mean that it's just an objective, incorrigible fact that killing other human beings is Wrong (even if not, perhaps, the greatest of Wrongs). At this point, though, he will have tacitly abandoned naturalism, since he would then have the fun task of trying to explain whether killing other men was Wrong before other men existed (i.e., during the vast bulk of historical Time). If so, Who or What was the placekeeper for our eventual recognition of that fact? (For example, objectively speaking, two hydrogen atoms combined with one oxygen atom has always meant water-- that's what water _is_ --even before any human was around to describe water or discover its properties. Why would human murder be wrong on a similar type of grounds predating humanity?) If murder was _not_ wrong before other men existed, he'll discover pretty quickly (if he tries) that he'll have to tie this emergence of this 'objective' fact to our particular physical arrangement; and that will bring him back to options c, b, or a, which reduces this impression to a subjective illusion based on something objectively physical which is not itself really a _moral_ fact--and which leaves us with only the objectively obvious improvement of efficiency (meaning it's certainly not self-evident that the advance in killing rate is _not_ an improvement.)

e.) He could claim that "The Evidence of Evolution Reveals a Universe With A Designer" and write another book, maybe entitled _The All-Seeing Lawmaker_. It would of course be a further question why this Lawmaker regards such a principle as Wrong (we could safely say He did so before humans existed, for we'd be saying that His personal characteristics were/are such that humans _eventually_ killing one another would run contrary to His eternal character in some respect.) Is this contrary to the Lawmaker because of an arbitrary decision He made/makes, or because He respects some authority of morality superior to Himself? I've already noted in an earlier chapter how Christian trinitarian monotheism solves this dilemma. But then, I doubt Mr. Dawkins is going to advocate this option anyway!

All of this presupposes, of course, that Mr. Dawkins meant that the sense in which such an advance is not an improvement is an _ethical_ sense of some sort (subjective or objective.) If he didn't mean that, then feel free to ignore a-through-e above. Of course, _you_ might wish to pay attention to it if _you_ happen to arrive at similar conclusions about advances in killing _not_ being an improvement, on ethical grounds! Meanwhile, if Mr. Dawkins doesn't mean something ethical by this (which I suppose is technically possible, though I'd find it hard to believe given his previous remarks about thalycines, speciest assumptions, etc.), then he's left us rather a problem-- it's hardly otherwise self-evident that an advance in killing is _not_ an improvement. Measured against the standard of physical efficiency, it obviously _is_ an improvement--what else could he mean??

Mr. Dawkins himself notes that development is not necessarily improvement on p 218, using languages as his subject:

"[A]lthough modern English has evolved from Chaucerian English, I don't think many people would wish to claim that modern English is an improvement on Chaucerian English. Ideas of improvement **or quality** do not normally enter our heads when we speak of language. Indeed, to the extent that they do, we often see change as deterioration, as degeneration. We tend to see earlier usages as correct, recent changes as corruptions." [italics mine]

Now, I should point out at least two things in fairness:

1.) As far as I can tell, Mr. Dawkins is still using the term 'evolution' in a self-consciously loose way here; he pointed out to us earlier that though we often call such development 'evolution' due to some of the similarities of process, it's not really evolution.

2.) Therefore I'm not going to try suggesting that Mr. Dawkins is testifying to the general trend of 'evolution' to degenerate, rather than advance; because I understand he's not really using the word 'evolution' in a sufficiently parallel sense here. On the contrary, the gist of Mr. Dawkins' remarks on language (here and previously on p 217) suggest to me that he sees the _change_ in languages

to be qualitatively neutral, though objectively measureable. Going back a tad to illustrate this:

p 217, "There is no doubt about it, in the narrow technical sense things do get better as time goes by. But this is only obviously true of technically useful things such as aeroplanes and computers. There are many other aspects of human life that show true trends without these trends being, in any obvious sense, improvements [language being one of these aspects]."

Now, I don't disagree with this; but my question is, 'To which category do human weapons belong?' In the "narrow, technical sense" it seems to me obviously true that human weapons, being "technically useful things", have gotten objectively 'better' as time has gone by. I would agree that there is another, _equally objective_ sense (i.e., not merely dependent on my personal taste) in which it is "too obvious to labour" that "this is not an improvement." But, I agree with that because I accept a fully supernatural creationistic theism wherein a truly objective Moral Standard exists above and beyond transitory human nature (counting us either as individuals or as a species), which has forged an internal connection with us so that our perceptions of 'conscience', while not perfect, at least have a valid grounding and the potential to be ultimately true. Mr. Dawkins has, ultimately, transitory human nature (either his own genetically, nonrationally, amorally inspired taste; or that of the human species in general and his social setting in particular at this point of human development) to fall back on as an explanation for why an increase of weaponry efficiency is "not an improvement" in a sense "too obvious to labour."

Of course, I don't really think that Mr. Dawkins is getting his ethical ideas from that pool of biochemical reactions; I think he gets them from the same place I do--from God, through direct inspiration of conscience and indirect transmittal of cultural history. This is a fair assertion, since I can predict fairly easily that he believes I get my ideas of ethics ultimately from nonrational amoral pressures (genetic, sociological, behavioral, etc.). The question I'm asking at this point (and have asked at similar junctures earlier in SMB) is not which of these two grounds is really the Ultimate Ground (though I have been discussing that, too), but which of us--given briefly in turn the assumption that we're correct--is immediately

contradicting the implications of his own assertions.
Assuming for the moment that I'm right, I'm claiming that
my imperfect reason and ability to perceive ethics comes
ultimately from a source which is perfectly Rational and
Ethical. Assuming for the moment that Mr. Dawkins is right,
he's claiming that his imperfect reason and ability to
perceive ethics comes ultimately from a source which is
utterly nonrational and amoral. Both of us would claim the
ability to be at least potentially correct in reasoning and
in ethical perception, even if we happen to be making
mistakes on some particulars. If we didn't agree on this,
we wouldn't be writing books to argue our sides to you, the
reader; and we wouldn't both contend that humans have
duties and responsibilities (e.g., not to slaughter all the
thalycides in Australia or make racist assumptions.)

Ask yourself a simple question: if I was unsure about a
principle of biology, and had narrowed it down to two
possible options, where should I turn? Should I ask Mr.
Dawkins, or should I call one of the options 'heads' and
flip a coin? True, I might get a result from the coin that
was, in fact, correct, but I'd have no _logical_ grounds
for _trusting_ the answer; whereas from Mr. Dawkins, at
least, I'd have a chance of finding a logically grounded
answer that I can trust. In actual human disputation, we
turn from a reasoning we recognize as being only partially
correct to what we hope is a more fully correct source of
reason; we do _NOT_ turn to nonrational, nonmoral chance--
and if we are forced by necessity to do so, we recognize
that whatever answer we get is merely for convenience, and
we have no grounds to trust it. We regard people who really
do follow the 'Magic 8-ball' as irresponsible, and possibly
mad. But the philosophical naturalists are seriously
suggesting that, at bottom, _their own theories_ are the
result of processes which are as ultimately nonrational and
nonmoral as a flipped coin or a floating dodecahedron (even
if mind-bogglingly more complicated.) And yet they
nevertheless expect us to attend to their arguments as if
they might possibly be logically grounded. Which of us,
then, is being inconsistent here?

Here is another way to make the same point (in fact, it
hearkens back to a bit of sarcasm I levelled in an earlier
chapter.) On pages 218-220 (the last pages of Chapter 8),
Mr. Dawkins examines a strong parallel with biological
sexual selection: record and book sales. Here are some
excerpts from his comparison.

pp 218-219, "If you listen to discussion among aficiondos
of pop records, or switch on the mid-Atlantic mouthings of
disc jockeys on the radio, you will discover a very curious
thing. Whereas other genres of art criticism betray some
preoccupation with style or skill of performance, with
mood, emotional impact, with the qualities and properties
of the art-form, the 'pop' music sub-culture is almost
exclusively preoccupied with _popularity itself_. [his
italics] It is quite clear that the important thing about a
record is not what it sounds like, but _how many people are
buying it_. [his italics] [...] It appears to be a fact
that many people will buy a record for no better reason
than that large numbers of other people are buying the same
record, or are likely to do so. [...] To a lesser extent,
the same phenomenon of popularity being popular for its own
sake is well known in the worlds of book publishing,
womens' fashion, and advertising generally. One of the best
things an advertiser can say about a product is that it is
the best-selling product of its kind. Best-seller lists of
books are published weekly, and it is undoubtedly true that
as soon as a book sells enough copies to appear in one of
these lists, its sales increase even more, simply by virtue
of that fact."

If you turn to the cover of the 1996 paperback edition of
TBW, you will note that, as it happens, it has also been a
"National Bestseller". Now, what explanation do you think
Mr. Dawkins thinks proper to accept for this? Because, by
accident, enough of his books were bought in certain select
markets to make the bottom rung of the best-seller list
where people who follow that list slavishly would react by
buying their own copies, thus pushing it higher on the list
(and the higher it goes, the more likely it is to go
higher?) Or because he wrote a book with loads of true
information that people needed to hear? Both reasons could
well be true, of course; the best-seller list followers
might be following the list by inferring that a book
wouldn't be on the list unless it were high quality--and
even though they could be wrong, they might (for all they
know until they buy the book) be right, too. The initial
quality of TBW could get it in the door, and the runaway
sales _also_ happen to follow in a self-reinforcing
positive feedback loop. But notice that the _meaning_ of
the second fact (TBW's eventual best-seller status) depends
entirely on the condition of the first fact (TBW's actual
quality.) If a book with manifestly poor quality in

arguments--something that only misleads the people for whom
it is written--manages to be a financial success, then
those who recognize the cruddiness of the book (and who
hold the disemination of true facts and arguments in high
regard) will judge its success to be a monumental
tragedy. Mr. Dawkins quite agrees with me on this
principle: in fact, he deems it something of a tragedy when
false ideas are transmitted to the public with _any_ degree
of success (e.g., recall his introductory opinion of
Francis Hitching's _The Neck of the Giraffe_ on p 79 of
TBW--just after point #5 in chapter 4, if your copy of TBW
doesn't mesh with mine.)

For that matter, I can even agree with Mr. Dawkins that if
my own book (SMB) happens to be filled with error and poor
logic, and thereby misleads you, the reader, and yet
happens to be a best-seller; it will be (in an objectively
qualitative sense) as much of a tragedy as it will be (in
an objectively quantitative sense) a financial success--in
about the same proportion, come to think of it. I don't
want to write crap; I don't want to be _responsible_ for
writing crap! I don't want _other_ people to be misled by
_my_ mistakes (if any). I think if such things are done on
purpose it's a sin; and even if they're done by accident
it's a tragedy. I think humans (myself included) _deserve_
the truth, whether it's from me or from someone else. Mr.
Dawkins certainly seems to think so, too, in principle
(refer to the anecdotes in his preface). On the other hand,
he also calls human rights and human dignity (the only
things by which any real 'deservedness' or 'desert' could
exist for humans) "unquestioned speciesist assumptions" (p
114) of apparently the same calibre as unquestioned racist
assumptions dating from the 19th century. Again, who is
being inconsistent here?

If Mr. Dawkins places a negative ethical value on the
transmission of false conclusions, then similarly he puts a
positive ethical value on the transmission of true
conclusions. And this value is, for him (and I agree),
something different than mere efficiency of sales:

p 220, "A book's, or even a pop record's, **real
qualities** are **not negligible** in determining its
sales, but nevertheless, wherever there are positive
feedbacks lurking, there is [also] bound to be a **strong
arbitrary element** determining which book or record
succeeds, and which fails." [italics mine]

We thus have a clear statement from Mr. Dawkins himself to
a functional belief in several propositions:

a.) There are, in fact, _real_ qualities at work in this
scenario.
b.) They are, in fact, not even negligible--they have more
than a passing influence on the scenario.
c.) They are also, in fact, _distinguishable from_ any
strong arbitrary elements in the scenario.

Very well then. _Everything_ that Mr. Dawkins has attempted
to account for in this book is, on his theory, an ultimate
product of strong arbitrary elements (and let me restate
that as 'forces' to avoid an accidental restriction of the
idea to 'chemical elements'). How can these 'real'
qualities be in any functional sense _actually_
distinguishable from the strong arbitrary forces? They
can't; they are only the strong arbitrary forces themselves
in a particular arrangement, and/or looked at from a
particular point of view. And, of course, these 'forces'
are not really what the 'real' qualities are made of
anyway; in fact, they are only _our_ measurements of the
physical states of some variety of purely physical
subatomic entities. This is a non sequitor: add enough
muons, gluons, quarks and electrons together in a
particular way, and we supposedly get 'truth' or
'falsehood'--something _really_ distinguishible from what
the physical material was otherwise bound to produce as a
nonrational, nonmoral, purely physical effect should they
ever get into that arrangement. Once more, who is being
inconsistent here? How many times will we see the 6=16
paradigm applied by Mr. Dawkins to propose and defend his
theory? How many feathers can be piled on the camel's back
before the camel collapses? And how many of those feathers
are really anvils?

Comparing Onions to Cans of Mountain Dew;
aka, Chapter 9: Puncturing Punctuationism

My guess is that, aside from Chapter 6 (wherein Mr. Dawkins
presents the summation of his attempts to remove
supernaturalism from contention as a valid option), this
will be--or should be--Mr. Dawkins' most important chapter.
The reader will perhaps remember some earlier comments of
mine to the effect that I've been rather suspicious about
Mr. Dawkins' strategy of focusing primarily, and at length,
on probability theory _prior_ to (sequentially, and
apparently logically) his presentation of the actual, hard
data. Let me take a moment to flesh out my suspicions more
clearly, and remind you where we're at so far in TBW.

I'll start by noting that, in all fairness, I think Mr.
Dawkins is correct (in principle) to try to get
philosophical considerations out of the way before
turning to the data. Science is built on philosophy, not
the other way around. Scientific _procedure_ (and,
subsequently, scientific _conclusions_ and _theories_) are
different from philosophical argument, of course--science
relies on observation, measurement, categorization and
(thereby) inferred conclusions about the natural world.
(Philosophy also relies on observation, but not to the
rigorous extent required by science.) But these procedures
require numerous premises without which the data cannot be
scientifically applied--and these premises are not
themselves scientific, but philosophical. To give just one
example of a philosophical premise which must be assumed by
all scientists (regardless of their religious,
antireligious or otherwise philosophical beliefs) in order
to render potentially valid scientific conclusions: the
laws of nature must be assumed to be objectively uniform.
That is, they are _ASSUMED_ to be coherent, potentially
knowable, and constant throughout time and space. Their
effects, of course, will not be uniformly constant;
light, for example, bends its path when it passes near a
sufficiently strong gravity field. Einstein, however, was
able to predict this before it was confirmed, and according
to eyewitness testimony he had no doubts whatsoever that it
would indeed be confirmed--it was a mathematical certainty.
And this certainty was not just based on the self-
consistency of his calculations; it was also based on the
underlying assumption that nature would not change its
characteristics between the time he presented his theory
and the gathering of the observational data to test it

empirically. Had the data not supported the theory, it
would have been his theory (not the laws of nature) which
was not in sync.

The Assumption of Uniformity is an easy-to-see example of
how science rests on non-scientific premises. There is
simply no logical way to scientifically conclude, or even
empirically verify, that nature is uniform. How could it?
All scientific conclusions themselves _depend upon_ this
premise! For example, if I drop a rock one million times
and it falls in the same spot one million times, have I
demonstrated that a natural law is uniform? No; I may claim
that I've discovered _one of_ the uniformities, but that
assumes there are uniformities _to be discovered_, already
in existence and independent of our observations.

Incidentally, this leads us to one of the unsettling
aspects of quantum physics: the properties of certain
particles apparently depend on rational observation for
their determinate characteristics, and scientists are still
scrambling to figure out what this implies about reality in
general. It certainly _seems_, at any rate, that the moon
goes about its 'business' without being observed by humans,
to the extent that given certain starting information about
it we can predict with an extremely high degree of accuracy
what state it will be in at Time X in the future--which
implies that the moon is in fact behaving that way when
we're not looking. The observational determinancy problem
does not appear solvable by recoursing to an average 'wash'
of particular states (e.g., the moon behaves in a
predictable manner on the macroscale because the various
quantum states of its particles mostly cancel each other
out), because a quantum wash implies that non-observed
quantum states still have determinate characteristics which
can 'add up' (like force vectors). But apparently this is
not the case at all; quantum characteristics have no
determinate values until observed, and thus have no
determinate values to 'wash out' until observed. The
implication seems to be that the moon (the size of the
composite object makes no difference, as Schroedinger
pointed out with his satirical 'cat-in-the-box'
illustration) had no determinate characteristics until
humans first observed it, which is the same (functionally)
as saying that the moon did not (and does not) exist until
someone sees it; yet for it to be seen by us requires that
it exist to be seen. One conclusion from this is that the
data we're getting from quantum physics seems to require,

as a _logical necessity_, an omnipresent rational observer whose own characteristics are not similarly dependent on observation--in short, a monotheistic God, like the sort theists believe in. (I owe Dan Winslow my thanks for bringing this theory to my attention a few months months before I began SMB.)

This is beside the point of my book, of course; and I want to remind the reader that this issue is still being hotly debated (Schroedinger developed his cat-in-the-box example, for instance, to illustrate the _absurdity_ of the implications). But it does illustrate that legitimate science can come up with scientific conclusions (be they right or wrong) which match what religious belief predicted.

Getting back to my original point, science requires the acceptance of numerous philosophical positions as premises for valid scientific arguments. These philosophical positions may themselves be brute assumptions (the rationality of the scientific thinker, for instance), or they may be philosophical conclusions (the first Western scientists believed nature was uniform _because_ they believed, to one degree or another, nature had a Creator Who acted cogently.) Either way, it's a good idea to try to figure out philosophical considerations as far as possible before drawing scientific conclusions about the data. So, for example, a scientist who happens to have (or thinks he has) an airtight argument in favor of naturalism will quite logically reject an omnipotent rational observer independent of nature as a solution to the problem of quantum observability. _Given_ naturalism is true, then some other explanation for nature's apparent uniformity must be true; and there will have to be some explanation, because without nature's ultimate uniformity to start with, we'd never have reached conclusions about quantum mechanics in the first place!

(I should point out in passing that the principle of nature's uniformity is not the same thing as the principle of nature's transcendence, or inpregnability. Remember the example of 'accounting': for it to really work, the accounting rules must be uniform and nonviolable, but that certainly does not preclude us feeding monetary data into the rules. The rules provide a framework for us to analyse real, or potentially real, monetary transactions; their uniformity does not prevent us from using accounting.

Indeed, if we break the rules we end up with conclusions
that do not match reality, and so don't _really_ 'work'--
which is precisely why crooked accountants break the rules
to cover what they're _really_ doing with the money!)

Part of my introductory commentary to this chapter, then,
is a defense of Mr. Dawkins' strategy of trying to clear up
philosophical issues first before going to the data. I
don't think he's actually _accomplished_ the removal of
supernaturalism as a viable option; on the contrary, not
only has his logic been faulty (as far as I can tell and
show), but he seems to be leaving little bits of trace
evidence around in his argument that logically point back
to some sort of creationistic theism (if we bother to
follow the trail.) But I do agree that it was proper for
him to try this.

What was I suspicious about, then? _NOT_ his priority of
philosophy before the data, but of _probability_ before
the data! Probability estimates _require_ data before and
after the estimate. To estimate the probability of rolling
two sixes on a pair of casino dice, I need to know the
relevant characteristics of the casino dice; and if, after
I make my estimate, the actual data shows that I'm rolling
a 12 once every twelve rolls on average (instead of once
every thirty-six rolls on average), then I have grounds for
supposing that there's a characteristic of the dice I
haven't taken into account yet (for instance, that someone
loaded the dice.) This means there's probably something I
could have potentially discovered (but didn't) before I
made my original estimate. Any attempt afterwards to make
my original estimate fit the actual data received must be
viewed with extreme caution at the very least.

And all this assumes that that original estimate was valid,
as far as it went. I have argued extensively that Mr.
Dawkins, while admittedly clearing up and correcting some
abuses of probability theory, nevertheless misuses
probability himself in a quite spectacular fashion. To cite
perhaps the most pernicious example, Mr. Dawkins attempts
to redefine the posited action of a conscious entity
superior to a given system (God vs. nature) as something
capable of being probabilistically described from within
the system--a contention which, I argued, was similar to
trying to calculate the probability of someone setting
down, or otherwise altering (before or after the roll), a
pair of casino dice to a certain setting. This is not

something that can be probabilistically described within
the same constraints as the dice-probabilities themselves;
and depending on circumstances may not be probabilistically
describable at all. Yet, Mr. Dawkins (in effect) tries it
in Chapter 6 by illegitimately redefining the term
'miracle' to mean a statistically improbable natural event,
and then arguing as if he were thereby showing certain
other natural random improbabilities to be a better 'bet'
than creationistic theism--despite the fact that _no_
supernaturalistic creationistic theist claims a miracle is
only a highly improbable natural event!

Be all that as it may, I wondered at the time why we hadn't
seen anything about the actual hard data of macroevolution-
-for instance, the fossil record. Indeed, I ran across a
highly suspicious remark in Chapter 7, back on page 192:

"We are unlikely to witness arms races in dynamic progress,
because they are unlikely to be running at any particular
'moment' of geological time, such as our time. But the
animals that are to be seen in our time can be interpreted
as the end-products of an arms race that was run in the
past."

He had been discussing the theory of arms-race development
in evolution. On the face of it (as I pointed out at the
time), the paragraph appears to be saying the following
things:

a.) If we don't see this sort of thing happening in the
animals we're studying today in their living habitats,
that's okay--the theory predicts we'd be unlikely to
observe it without being able to study the development of
animals over thousands and thousands of years (long enough
to count as more than a geological tick.) The implication,
though, is that he _has_ to bring this up _because_, in
fact, we _don't_ see this happening naturally! We can
tamper with the process ourselves and get predictable
results under the theory, but that's hardly a fair way to
conclude nature _is certainly_ doing it automatically (only
that the potential is there, given a few other things.)

b.) But what about the fossil record? Doesn't that give us
just the conditions we need to check the theory against the
real world (assuming the theory was valid enough to begin
with to make it worth checking?) Wouldn't this be a great
time for him to reassure us about it? Yet he doesn't (not

on page 192, or anywhere else in Chapter 7--you can check
for yourself.) He sticks with the observations we make of
animals in our time, and notes that they can be seen as the
end-products of this sort of race. Well, true, they can;
but they can also be seen as end-products of direct
catclysmic design, or any of several other options between
these two extremes; so that's hardly a conclusive
statement. This paragraph, combined with his comment
earlier in Chapter 7 (p 188) that fossilization happens
only rarely, certainly seems to imply that, in fact, we
have no scientific evidence for macroevolution (the
development of species into species via random genetic
mutation combined with natural selection processes.)

I'm bringing all this up again, before I even dive into
Chapter 9, to illustrate to you, the reader, that Mr.
Dawkins' theory has a pretty hefty stake in how he treats
the fossil record evidence here. Ever since evolutionists
(scientific and/or philosophical) came on the scene, the
crudest and most simplistic criticism levelled against the
theory concerns the question of the Missing Link; the
fossil evidence that man is a genetically mutated ape. I
myself don't think the whole theory stands or falls on
this, but the principle behind the demand to "Show Me The
Monkey" (if you'll allow me to modify Cuba Gooding, Jr.'s
famous tag-line from the movie _Jerry McGuire_) still
remains: evolutionists of any stripe have a vested interest
in presenting the evidence of the fossil record in a way
which is not only internally self-consistent, but
consistent with evolutionary theory.

So, let's see whether Mr. Dawkins can be self-consistent
for a change...

We start off with an example drawn from the Bible, to be
used in a moment for allegorical comparison. As presented,
it makes a decent-enough illustration of the principle he's
about to discuss; but then again he doesn't present it very
fairly. I suppose I'll have to clarify this little
boondoggle before I can even move on to his real point.
First, let's get a snapshot of his presentation of this
particular story:

p 223 "The children of Israel, according to the Exodus
story, took 40 years to migrate across the Sinai desert to
the promised land. That is a distance of some 200 miles.
Their average speed was, therefore, approximately 24 yards

per day, or 1 yard per hour; say 3 yards per hour if we
allow for night stops. However we do the calculation, we
are dealing with an absurdly slow average speed, much
slower than the proverbially slow snail's pace (an
incredible 55 yards per hour is the speed of the world
record snail according to the _Guinness Book of Records._)
But of course nobody really believes that the average speed
was continuously and uniformly maintained. Obviously the
Israelites travelled in fits and starts, perhaps camping
for long periods in one spot before moving on. Probably
many of them had no very clear idea that they were
travelling in any particularly consistent direction, and
they meandered round and round from oasis to oasis as
nomadic desert herdsmen are wont to do. Nobody, I repeat,
really believes that the average speed was continuously and
uniformly maintained."

As Mr. Dawkins continues, he describes two (fictional)
eloquent young historians who burst on the scene and
propose a new theory: the Israelites travelled in
punctuated bursts, picking up and moving rather fast to a
new encampment and then settling there for a period of time
(say, several years.)

p 224 "[P]rogress towards the promised land, instead of
being gradual and continuous, was jerky: long periods of
stasis punctuated by brief periods of rapid movement.
Moreover, these bursts of movement were not always in the
direction of the promised land, but were in almost random
directions."

As the allegory continues, the 'punctuationist' biblical
scholars become media sensations through their "eloquence".
In this allegory, Mr. Dawkins allows their fame to spread
purely because they're (in essence) 'cool' to listen to,
and because they play up their public personas as
revolutionaries against the established gradualists (who
say the Israelites moved more-or-less constantly toward the
promised land at a rate of about 24 yards per day.)

Mr. Dawkins created this 'parable' to illustrate how the
public has perceived the debate between punctuationists and
prior evolutionists (whom the punctuationists apparently
did name 'gradualists'). As Mr. Dawkins notes:

p 224, "My story about the punctuationist biblical
historians is, of course, not really true. [...] In some

respects it is an unfair parable, but it is not totally
unfair and it has enough truth in it to justify its
inclusion at the beginning of this chapter. [...] The
respect in which the analogy is unfair is that in the story
of the biblical historians 'the gradualists' were
obviously non-existent straw men, fabricated by the
punctuationists. [...] In the evolutionary case, unlike in
the parable of the Israelites, there is a genuine
controversy lurking..."

We'll get to the analysis of the punctuationist vs.
'gradualist' evolutionists in a moment (I'd give the
'gradualists' another title, but Mr. Dawkins hasn't
supplied an alternate one.) Since I happen to be on the
side of the creationistic theists, and since Mr. Dawkins,
after admitting the allegory is unfair because there's no
facetious debate about how to interpret the Israelite
'migration' in Exodus, has neglected to mention _why_
there's no debate about it; I'm going to take the time to
clear the issue up--just in case you, the reader, were left
with the impression that the Exodus is a rather blatantly
inconsistent biblical story. (Not that Mr. Dawkins would
want to leave that impression with you, of course...)

The events of the story actually go like this (and you can
check for yourself in Exodus, if you like.) The Israelites
get across the Sea of Reeds ('Red Sea' is a late, but
pervasive, copyist error which has been known about by Jews
and Christians for a very long time) and escape into the
wilderness. Having lost quite a bit of his army in the
chase (and still reeling from the effect the 10 Plagues had
on his nation), Pharoah is obviously in no mood to attempt
fording the sea and assaulting the Israelites. (This is
just good, basic military tactics: don't overextend lines
of supply you don't have; don't attack an entrenched
opponent across a wide body of water unless you have a
really good reason; and particularly don't do this if the
opponent's terrain favors them tactically.) So, the
Israelites are left alone in the Sinai. Time to head for
the promised land; but while they're recouping and
reorganizing, God gives Moses the 10 Commandments and
basically instructs him on how to set up what will
eventually become known as the Mosaic Law. Moses is gone
for a while, onto a mountain which everyone in the tribes
recognizes is dangerous (volcanically so, according to the
imagery.) They're out on their own for the first time in
generations in an unknown, hostile wilderness; they don't

know whether Pharoah is going to push the chase; and God
looks awfully scary right about now (particularly
considering the spectacular miracles which preceeded the
Exodus.) Furthermore, they've just left a seriously
polytheistic country which uses idols a lot. Building a
golden calf for an idol was probably very reassuring; hey,
let's sit back and party! (Which they did, rather
orgiastically.) God knows all about this, of course (He's
the one who tells Moses to get back because the troops are
misbehaving); and of course God's rather upset and
disappointed with His people (this happens a lot in the Old
Testament!) He's not going to take back His word about them
getting to the promised land, but He adds some provisions
now: the current generation will not live to see the
promised land (with some obvious exceptions, like Moses--he
loses his chance later in a fit of temper.) This can also
be interpreted (as Mr. Dawkins has done) to mean that they
must stay in the Sinai for 40 years; 40 years being the
ancient Jewish equivalent of 'a generation'. Turns out this
is just as well anyway, because this gives them time to
become kick-butt desert warriors. They wander around the
Sinai from place to place searching for water supplies; and
the ancient Jews knew as well as modern geographers that a
population that size couldn't live there without help,
which is why they get the miraculous manna and doves every
day in the story, to help keep them going. (I myself see no
reason to doubt this happened, but that's only because I've
got good grounds to trust Scripture in other details. Most
of my readers, of course, are going to dismiss this as a
convenient retcon explanation by the ancient Jews.)

Anyway, the Sinai generation wasn't blundering around lost
in the desert for 40 years, or crawling seventy-two feet a
day north-northeast, or anything else like that. They knew
exactly why they were there, and what they were doing.
They knew exactly where Egypt was, and after a period of
time (probably as the kids and babies started growing into
authority figures themselves) there was some debate about
whether it would be a better idea to just find a way back
across the Sea into Egypt and (in essence) get their old
jobs back. Of course, they could have gone straight on into
the promised land, even after the golden calf incident--it
would've probably taken them anywhere between 50 and 200
days to get there. The Sinai is about 200 miles of broken,
mountainous badlands, so 1-4 linear miles a day is not
unreasonable, particularly for people who until just
recently had been starved slaves. Remember they had to go

up and down mountains, which increases the raw foot-
distance, as well as having to fight the effects of
gravity, bad footing, etc. Why didn't they go immediately?
Because they didn't want to hack God off any more than they
already had! Even the guys lobbying for a return to Egypt
weren't suggesting that they just go on to Caanan. There's
a big difference between giving up on a deal with God, and
openly flouting His wishes. This was the God who had just
nuked Egypt, after all; and, besides, Moses had had at
least 3000 Israelites killed by the sword for the golden
calf incident (from a description of that order, it appears
they killed the men and women who were partying the
hardest--the most drunken, the most adulterous, etc.)

So, yes, Mr. Dawkins' little allegory is quite unfair; and
this is why there's no serious debate about why it took the
Israelites so long to get across the Sinai. It doesn't
matter (for purposes of this book) whether you, the reader,
believe any or all of this actually happened; my only point
here is that the story (fictional or not) is self-
consistent.

Mr. Dawkins moves on to explain (p 225) that the
punctuationists originally came from the ranks of
palaeontology: scientists who study fossils. Mr. Dawkins
tosses off two 'schools of thought' prior to evolutionary
theory regarding the fossils--the bones were creations of
The Devil, or the remains of sinners drowned in the Flood--
but neglects to mention the third theory about the bones,
still held to this day by some (not all) creationists:
they're the bones of _animals_ drowned in the Flood. I'm
not going to defend that contention myself; as of the
writing of SMB I haven't found the 'drowned remains' theory
very persuasive. For instance, one would think that there'd
be a proportionate amount of human remains, at least in the
'inhabited' areas of the earth at that time, though
apparently there's not. They do however raise a few
interesting points regarding the rate of fossilization, the
characteristics of porphryns in oil deposits, etc., so I'm
not writing their theories off altogether.

Anyway, the point about punctuationist evolutionists coming
originally from the ranks of palaeontology is that (as Mr.
Dawkins states, p 225) "[A]ny theory of evolution must have
certain expectations about the fossil record. But there has
been some discussion of exactly what those expectations

are, and this is partly what the punctuationism argument is all about."

Mr. Dawkins repeats the point (from back in Chapter 7) that fossilization is a fairly rare process.

p 225, "Yet, there are certain things about the fossil record that any evolutionist should expect to be true. We should be very surprised, for example, to find fossil humans appearing in the record before mammals are supposed to have evolved! If a single, well-verified mammal skull were to turn up in 500 million year-old rocks, our whole modern theory of evolution would be utterly destroyed. Incidentally, this is a sufficient answer to the canard, put about by creationists and their journalistic fellow travellers, that the whole theory of evolution is an 'unfalsifiable' tautology."

A point well taken; though perhaps the reader will note that _I_ (as a creationist) have never made that claim. Also, I wish I could meet some of those "journalistic fellow travellers" who apparently help keep creationism in the minds of the public; I try to keep abreast of media coverage of the ongoing debate, and it certainly seems to me that the modern media is much more on the side of the evolutionists than on the creationists, and has been for decades (even before TBW's original publication.) The journalistic fellow travellers seem to be a few ultraconservative magazines with limited circulation.

p 225, "Ironically, it is also the reason why creationists are so keen on the fake human footprints, which were carved during the depression to fool tourists, in the dinosaur beds of Texas."

I don't recall ever basing any arguments on _them_, either; though I have seen a (very) few attempts at using them in the 'creationist' literature. This is the first I'd heard that they were forged, though. I would have been very interested to hear some evidence on this--I like clever arguments, and it's not like I'm committed in any sense to the tracks' validity--but unfortunately Mr. Dawkins provides none, and provides no references. I'd _like_ to feel I could just take his word based on his previous competence at evaluating data, but...?

Continuing, Mr. Dawkins notes that the debate between the
'gradualists' (perhaps we should call them the 'orthodox
evolutionists'?) and the punctuationists centers on the
observation that the fossil record is something of "a
higgledy-piggledy jumble" (to use his phrase.) The becomes
a problem because the position of the fossils in the strata
has a bearing on the date assigned to the fossils, and from
this Mr. Dawkins moves to a brief discussion of the dating
process.

Sediments of the sort we find fossils in are deposited very
slowly, at a generally recognized rate; and so given that
some fossil deposits are deeper than others (which they
are), and given that it's entirely reasonable to presume
that upper layers are deposited after lower layers,
palaeontologists can get a rough guesstimate about the
timeframe involved in the fossil deposits. As Mr. Dawkins
notes, a volcanic eruption can 'backflip' a limited section
of a layer on top of another layer, reversing the order of
layers (meaning we have to count backwards from the top to
bottom to go from oldest to most recent), but those events
are rare and cataclysmic enough that it's easy to tell when
something like that has happened. However, this is all a
very rough guesstimate in time-scales--we had to wait for
the development of radiometric dating to get more precise
estimates.

Radiometric dating works on the following assumptions,
observations and conclusions:

a.) There are unstable radioactive isotopes of certain
common elements that are ingested by animals and plants
along with the normal, stable elements.
b.) These radioactive elements decay into more stable
elements (Carbon-14 into Carbon-12 to use well-known
isotopes) at a mathematically predictable rate.
c.) This rate of decay is unaffected by virtually any
super-atomic environmental considerations. (e.g., the
presence of an atmosphere six times more rich in carbon
dioxide, just to pull a number out of the hat, has no
effect on how fast C-14 turns into C-12 from one eon to the
next.)
d.) The ratio of unstable isotopes to stable decay-products
of those isotopes is assumed to be homogenous. For
instance, a tyrannosaur ingests the same relative amounts
of the various carbon isotopes throughout its life, and
these ratios are pretty much universal for any lifeform at

any period in any geological location, irregardless of
environmental conditions or brute chance on the part of the
animals or plants.
e.) However, once the plant or animal dies, it consequently
stops taking in this mixture of isotopes.
f.) Therefore, with no new ingestions of radioactive
isotopes to keep the ratios at their normal homogenous
level, the radioactive isotopes decay in a predictable
fashion into their stable forms.
g.) Thus, one need only determine the current ratio of
radioactive isotopes to nonradioactive isotopes in a given
fossil organism to determine, within a palaeontological
useful span of time, how old the fossil is.

Mr. Dawkins rightly points out that Carbon-14:Carbon-12
dating is unsuitable for palaeontological efforts; it
decays far too quickly (relatively speaking.)
Palaeontologists apparently use other decay-rates, such as
potassium:argon.

In passing, one of the (few) possibly valid points I've
seen some of my 'creation science' brethren make, regards
assumption 'd' in the list above; is this actually a fair
assumption? Does nature really provide us with ratios of
isotopes evenly and constantly spread through the
environment like this? I don't know enough about geology to
tell if they have a point or not, but if they do it puts a
serious kibosh on our ability to radiometrically date
fossils. (Doppler-shift dating astronomical objects is less
of an issue to them, since there are some version of
biblical interpretation which suggest a six-day _remaking_
of the earth in the recent past after a major catastrophe
rendered the earth "formless and void"; but that's way
outside the scope of my book, and outside the scope of my
referrent knowledge for that matter.) Maybe this isn't a
problem, though; you may wish to investigate this for
yourself and see whether palaeontologists are just flat
assuming this homogeneity, or whether we actually discover
it experimentally in nature (or perhaps whether radiometric
dating takes different environmental emphases into account
in some fashion.)

I'll also point out in passing that one of the writers whom
I've seen question this assumption (to the stated
conclusion that radiometric dating such as carbon-dating,
was unreliable and shouldn't be used as evidence) argues,
less than two pages later, in favor of the validity of

those dinosaur/human cross-tracks Mr. Dawkins just
mentioned (or ones just like them, perhaps) by recoursing
to the carbon-dating of nearby plants in the same sediment!
Things like that from my side make me want to bang my head
on the keyboard.

On pages 227-228, Mr. Dawkins gives us, as a supposition, a
full fossil record of every animal that every lived. (This
is merely to illustrate a coming point.) What, he asks,
would various evolutionists (real and nonexistent
cariactures) expect to find in that record, once it was
laid out?

The cariacturised 'gradulalists' would (per the
cariacturization) expect that evolution would:

"...always exhibit smooth evolutionary trends with fixed
rates of change. In other words, if we have three fossils,
A, B, and C, A being ancestral to B, which is ancestral to
C, we should expect B to be proportionately intermediate in
form between A and C. For instance, if A had a leg length
of 20 inches and C had a leg length of 40 inches, B's legs
should be intermediate, their exact length being
proportional to the time that elapsed between A's existence
and B's."

To fit this cariacturization of the 'gradualists' into a
more-or-less real-life circumstance (the development of the
earliest known member of the horse family, _Hyracotherium_,
into sizes we would recognize as horse-like) we'd have a
leg-growth-rate for the horses of 20 leg-inches per 20
million years, or one-millionth of an inch per year. Mr.
Dawkins continues:

p 227, "Now the cariacture of a gradualist is supposed to
believe that the legs steadily grew, over the generations,
at this very slow rate: say four-millionths of an inch per
generation, if we assume a horse-like generation-time of
about 4 years. The gradualist is supposed to believe that,
through all those millions of generations, individuals with
legs four-millionths of an inch longer than the average had
an advantage over individuals with legs of average length.
To believe this is like believing that the Israelites
travelled 24 yards every day across the desert."

Which, of course, we know to be patent nonsense; and, of
course, you now know why, no thanks to Mr. Dawkins.

To illustrate why this is a problem (the psuedo-gradualist theory, not the pseudo-gradualist Exodus strategies!), Mr. Dawkins restates the observations in terms of human skull size from a (proposed) _Australopithecus_-like human ancestor to _homo sapiens_; a change of about 900 cubic centimeters in average volume. According to pseudo-gradualist theory, every human generation between the two species would increase brain-size but .01 cc. Yet human skulls today easily range in brain-size between 1000 cc and 2000 cc. Even this would not be a problem for the pseudo-gradualist theory (remember, gradualists don't actually hold to this theory anyway; Mr. Dawkins is describing the cariactures of gradualism.) After all, it's the average that counts; but that extra .01 cc average increase per generation was supposed (on pseudo-gradualist grounds) to provide a significant survival advantage--something which seems patently falsified by our own experiences with small-and-large-skull people.

Having presented the cariacturized gradualist, Mr. Dawkins intends to illustrate what gradualists _actually_ believe. But since his goal here is to demonstrate the actual wideranging _agreement_ gradualists share with punctuationists (despite a few prominent differences), he turns next to examine what the punctuationists were actually claiming (after which he'll return to the gradualists and show where they dovetail.)

He starts by admitting that (p 229), "Darwin, and most others following him, have assumed that this is mainly because the fossil record is imperfect. Darwin's view was that a complete fossil record, if only we had one, _would_ show gentle rather than jerky change." In other words, that part of the cariacturization of the gradualist apparently wasn't a cariacturization after all; at least that's what the sentence seems to imply. "But since fossilization is such a chancy business, and finding such fossils as there are is scarcely less chancy, it is as though we had a cine film with most of the frames missing. We can, to be sure, see movement of a kind when we project our film of fossils, but it is more jerky than Charlie Chaplin, for even the oldest and scratchiest Charlie Chaplin film hasn't completely lost nine-tenths of its frames."

The implication, of course, is that evolutionists can reproduce the conclusions they're looking for from the 10%

of the 'frames' remaining--and in fact, that they can
clearly deduce that there really _was_ another 90% material
once upon a time. No details on how they do this, yet,
though it will be helpful if and when Mr. Dawkins provides
them. Meanwhile, as a former broadcaster, I note that it
can be hard to tell what's happening between frames if the
10% remaining film tends to clump together leaving huge
gaps of the 'story' unrepresented. Of course, if the
existent frames are distributed fairly regularly then
there's much less of a problem: in film and television, in
fact, this situation is an actual editing technique called
'frame dropping', and it produces a speeded-up look which
can be fairly smooth. Also, to be fair, if the 10% is
restricted to uniform clumps in film, it's entirely
possible to reconstruct a good bit of the plot even if the
clumps are shown out of their original chronological order.
The preview to the movie _The Mask of Zorro_, with Antonio
Banderas and Anthony Hopkins, lasts only 2% as long as the
movie itself, yet manages to give away practically all the
plot and action sequences!

I'm not really complaining here; just looking for a bit
more information--and trying to point out that, in the
absence of such extra information, it's not illogical to
wonder whether the fossil record _really_ tells the story
the evolutionists claim. Sceptics should understand the
principle involved quite well; if I casually mentioned that
the Gospels provide mostly snapshots of Jesus' life (and in
the case of Matthew, Mark and Luke the snapshots aren't
even in chronological order), and just left you with that
bit of information, how far would you be willing to trust
any claims I subsequently made about what they _mean_?
Anybody ready to become a Christian yet on _that_ ground?
Didn't think so.

In the middle of page 229, we're introduced to the two
American palaeontologists who apparently fill the "two
eloquent young historians" slot in Mr. Dawkins' opening
allegory for this chapter: Niles Eldredge and Stephen Jay
Gould. Their _actual_ suggestion (as opposed to the
misrepresentations of their suggestion which Mr. Dawkins
will get to momentarily) was as follows, in Mr. Dawkins'
words:

"Maybe the 'gaps' are a true reflection of what really
happened, rather than being the annoying but inevitable
consequences of an imperfect fossil record. Maybe, they

suggested, evolution really did in some sense go in sudden
bursts, punctuating long periods of 'stasis', when no
evolutionary change took place in a given lineage."

Okay, so what does their proposal _NOT_ mean? First:

p 229, "Eldredge and Gould certainly would agree that some
very important gaps really are due to imperfections in the
fossil record."

Meaning that they weren't just slathering 'punctuationism'
over every gap available like a quick-fix kit. ('In case of
problems with evolution, break glass!') That's a fair thing
to note. Mr. Dawkins is quick to point out, for instance,
that the puncutationists share the same opinion as the
gradualists about the Cambrian Explosion--the fossil layer
dating back about 600 million years where we find most of
the oldest fossils already in fairly 'developed' stages.
Mr. Dawkins points out that this need not necessarily
involve evidence of special creation, though:

p 230, "One good reason [for the relatively few fossils
found in strata older than 600 million years] might be that
many of these animals had only soft parts to their bodies:
no shells or bones to fossilize. If you are a creationist
you may think that this is special pleading."

Not necessarily; unless Mr. Dawkins wants to claim
evolution theory's validity hangs on this. If it can be
deduced or inferred (or a combination thereof) from other
evidence _and_ if those inferences and deductions are
systematically valid, then of course this is not special
pleading. If they _aren't_ particularly valid, then the
question of whether this is special pleading is moot
(because there are much worse problems in the theory under
those circumstances). Either way, I have no problem with
it.

p 230, "Both schools of thought [punctuationists and
gradualists] **despise** so-called scientific creationists
equally..." [italics mine]

Gosh, you'd think there was some sort of ethical motive in
despising scientific creationists; something along the
lines of, 'People _deserve_ to know the truth; and the
scientific creationists are warping and twisting the truth
to serve their own agenda, which they _should not_ do.' Of

course, we now know (thanks to Mr. Dawkins) that this
feeling of his is entirely a result of nonrational,
nonmoral environmental factors interacting with equally
nonrational, nonmoral genetic influences in his body, which
was ultimately designed... er, wrong word. Ultimately
purposed... um, nope. Which ultimately reacts chemically in
such a fashion as to spread copies of his genes into the
species gene pool. Kind of guts the whole point of
'despising' anyone, hm?

Also, the 'scientific creationists' I know of really are
applying scientific protocols to their work. They make
mistakes just like everyone else, of course; but that
doesn't justify the derrogatory remark "so-called". They
apply scientific procedures in service to
philosophical/metaphysical/religious beliefs, but so has
practically every other scientist in history--including,
rather obviously, Richard Dawkins himself. I have to
honestly admit that I've caught more than a few of them
arguing in a circle, special pleading, making category
switches, and presenting otherwise shoddy work. Then again,
if you've managed to get this far in SMB, you know at least
one other person who pretty consistently does the same
thing; and in 1996 he held the Charles Simonyl Chair of
Public Understanding of Science at Oxford, University--
which leads me to believe that he's generally considered to
be a scientist!

I should also point out in passing that I myself don't
"despise" evolutionists, be they biological or
philosophical or a combination thereof. I don't
particularly like the concept that people are being sold a
scientific shell-game that has had historical
repercussions--justified or not--in how people view
something that I think is rather important to their present
and future well-being, whether they recognize it or not.
But that's not the same as "despising", for instance, Mr.
Dawkins. I'd have to know him as a person much more
thoroughly, and I'd have to think that as a person he
'really' _deserved_ to be despised, before I went that far.
Even then, I might still be mistaken; he might not really
deserve to be despised. "Hate the sin but love the sinner"
has practical applications, not least because we (as
falliable humans) can't always be sure whether someone
really should be despised. I almost wrote '...was really
worth despising', which brings up another related point;
I don't really (except as a joke, or as a convenient

metaphor to describe a feeling) 'despise' a tree or anything else that can't help being what it is, whether or not I find it personally inconvenient, distasteful, etc. Something has to be potentially worthy in some sort of intrinsic, ethical, nonphysical way before it is, quite literally, 'worth despising'.

p 230, "... and both agree that the _major_ gaps are real, that they are true imperfections in the fossil record. Both schools of thought agree that the only alternative explanation of the sudden appearance of so many complex animal types in the Cambrian era is divine creation, and both would reject this alternative." [italics his]

Despite the fact that as of this point in Chapter 9, we still haven't received any evidential attempt from Mr. Dawkins at backing this wholesale rejection, much less a cogent philosophical reason for restrictively assuming it.

Next up, Mr. Dawkins describes yet another way the punctuationists could be misunderstood: they are _not_ saying that the gaps in the fossil record happen because of single, large-scale, macroevolutionary jumps. These theories are called 'saltation' theories, and Mr. Dawkins goes to some detail to explain them on pages 230-232. Although he presents statistical reasons for "rejecting all such saltationist theories" (p 231), once again a superreliance on statistics to refute something seems rather shaky to me. All the statistics still say the thing is possible (and I'll get to them later). The best reason for rejecting saltationism that Mr. Dawkins really presents is also the simplest, the first, and the "rather boring" reason (p 231): "members of the new species might have a hard time finding a mate."

This is internally self-consistent with any sort of evolutionary theory; it doesn't require shuffling improbability and impossibility again (p 234); and it doesn't require covert question-begging premises of one of the target conclusions (that no conscious, active Designer was involved.) Of course, its drawback (if you want to think of it like that) is that the "rather boring" refutation of saltationism doesn't seem to exclude Divine action across the board: God could have used any of a number of alternatives to saltationism, including a mass single-step creation (which only resembles saltationism in its final effect, not its process).

Skipping the next few pages to p 234, I'll be passing over
the first of the statistical arguments against
saltationism; I'll leave an analysis of it as an exercise
for the reader. For what it's worth, I consider it a
somewhat more sensible version of the Argument from
Impossible Improbables than some others we've seen
recently, but frankly he's almost used up any 'statistical'
credit he may have had with me long since. We can be
reminded of some of his more pernicious shuffles as he
begins the discussion of the second statsistical refutation
of saltationism on the top of p 234:

"In the biomorph model we **assumed** that this kind of
multi-dimensional improvement could not occur." [italics
mine]

Just in case anyone had forgotten what really took place
there.

p 234, "To recapitulate on **why** that was a
reasonable assumption, to make an eye from nothing you
need not just one improvement but a large number of
improvements. Any one of these improvements is pretty
improbable by itself, but not so improbable as to be
impossible. [...] If we choose to consider a sufficiently
large number of improvements, their joint occurrence
becomes so improbable as to be, to all intents and
purposes, impossible." [italics mine]

Just in case anyone had forgotten what justification he
gave for the assumption. Of course, he doesn't mean
ultimately impossible (except when he's talking about
supernatural propositions illegitimately redefined as
natural propositions behind our back). He means relatively
impossible. If we started at a few nanoseconds after the
Bang and considered the vast number of "nonpurposive"
"accidental" reactions and counterreactions between quarks,
atoms, molecules, etc. that would be necessary for Mr.
Dawkins, as himself, to eventually write TBW, as it is,
then his book's existence would look ghastly improbable.
Yet, here it is! So, it wasn't _really_ impossible; and you
have to wonder just how arbitrary "all intents and
purposes" are as a guideline for relative impossibilities.
(Heck, from what we've seen of the implications of Mr.
Dawkins' theory, we have to wonder quite _literally_ how

arbitrary "all intents and purposes" are, compared to TBW's own potential validity, don't we?)

Still, as long as we're talking about 'good bets' instead of ultimate refutations, saltationism doesn't look like a good bet to me, either.

Mr. Dawkins, on page 234, notes that older, simplistic attempts to refute evolutionism (like Sir Fred Holye's) on grounds of grotesque improbability actually ended up refuting saltationism instead: this is the famous hurricane-assembling-a-Boeing 747 example. Of course, that's not really a technical refutation of saltationism as a theory, despite what Mr. Dawkins claims--it doesn't show saltationism to be inherently self-contradictory, among other things. But it does fall into the 'wise to bet against it' category.

On the other hand, Mr. Dawkins presents the "Stretched DC8" version of macromutations, where an airliner is converted in a significant way by lengthening the fusalage to carry more people. This involves adding more seats, more lights, more of everything found in the rest of the plane; but then, that's just Mr. Dawkins' point: it's more of the same, so it's actually not difficult for DNA to reproduce it.

Unfortunately, the analogy isn't quite a fair one. The point to macromutations and their relative probabilities hinges on what Mr. Dawkins would call (justifiably or not) a 'single-step' event. In the 747 example, the producer of the single-step event (parts into 747) is a hurricane. Gosh, that's not likely. So what's the _stated_ difference about the Stretched DC8 example? The DC8 is already largely in existence and the changes, though complicated, are at bottom only more of the same; and thus plausible enough for Mr. Dawkins to accept them. A couple of things, though:

a.) So, what happened to the hurricane? You'd think from the structure of the analogy that the important part for Mr. Dawkins was the switch in propositions from junk-into-747 to DC8-into-stretched DC8. Is he saying that he'd consider it more plausible for that hurricane to effect the _stretching_? No, he considers it more plausible that humans could transmute a DC8 into its 'stretched' mode. That's not really comparing apples-to-apples in terms of process, is it?

b.) More-of-the-same has some rather unsettling
implications for Mr. Dawkins' own theory; the sort of
macroevolutionary jump he'd accept is the sort that will
carry the property of non-intention right up the line. That
should be setting off a warning bell in your head. There's
a qualitative jump being made in at least two categories--
morality and reason--which, so far as we've seen in TBW, is
simply and quite literally unaccounted for by his
evolutionary theory. He's only got, what? Two-and-a-
fraction more chapters to get it in? Time's running out.

Meanwhile, Mr. Dawkins notes that the DC8 analogy can be
applied easily to snakes:

p 235, "The middle part of the body of a snake, like the
middle part of the body of an airliner, is composed of a
number of _segments_, many of which are exactly like each
other, however complex they all individually may be.
Therefore, in order to add new segments, all that has to be
done is a simple process of duplication." [italics his]

All of which makes good sense (taken by itself, anyway.)
One bit of a strange remark a little earlier on the page,
though:

p 235, "Snakes, for instance, all have many more vertebrae
than their ancestors. We could be sure of this even if we
didn't have any fossils, because snakes have many more
vertebrae than their surviving relatives."

This rather begs the question of how we know lizards and
turtles and crocodiles are really "surviving relatives" of
the snakes if we (per his hypothetical example) did _not_
have some kind of fossil record to give us a hint about it!
I don't recall any suppositions along that line in the
history of science before palaeontology got started
(several decades before Darwin showed up, I might add.)
There were suppositions about species being related to each
other, of course, but there couldn't have been suppositions
about _surviving_ relatives until we had some reason to
think that there were _nonsurviving_ relatives from whom
the snakes and their surviving relatives both descended.
Maybe he means that our genetic capability today is good
enough that we don't need the fossil record to conclude
that snakes have deceased relatives? That would be a neat

and useful addition to his book, but Mr. Dawkins hasn't gotten to it yet.

p 236, "We cannot imagine a snake with 26.3 vertebrae."

Although, according to Mr, Dawkins earlier (which I agreed with, you'll recall), we _can_ imagine half a wing or 5% of an eye. In fact, he went to some effort to point out how and why this was a sensible image. He even labelled the principle (drumroll, please) _'gradualism'_ and he discusses it at length on pages 87-91. That being the case, I think we can imagine a snake with 26.3 vertebrae--that is, a snake with 26 full-sized vertebrae, and one about 1/3 sized. You may recall that in my remarks on that section (even without knowing ahead of time this topic would come up!), I supported him by adding a further refutation to the 'half-a-lung-is-stupid' theory: snakes (at least some of them) in fact have half a lung, one that's half the size of the other.

Of course, he's also right in the sense that a 1/3-sized vertebra is still 'one' vertebra (and consequently part of a set of 27, not 26.3); but it shows once again that he's not even being consistent in his claims about minor details.

p 236, "[The snake] either had 26 or 27 [vertebrae], and it is obvious that there must have been cases when an offspring snake had at least one whole vertebra more than its parents did."

Well, it's obvious if we first grant the validity of practically everything else in biological evolutionary theory; which means this contention can't be used to justify evolutionary theory's validity (though it does help a bit in the 'self-consistency' part.) While I'm on the subject, it also adds nothing at all to philosophical evolutionism theory--but I wasn't expecting it to, so I'm not holding that against it. (I just want to make sure that you, the reader, are remembering to keep the sets of contentions distinct. However interrelated one set of theories might be with the other, they're attempting two different tasks.)

Mr. Dawkins concludes his digression into saltationism, as compared to punctuationism, with the following (relatively sensible, I think) conclusion:

p 236, "The 'complexity argument' against saltatory evolution does not apply to Stretched DC8 macromutations because, if we look in detail at the nature of the change involved, they are in a real sense not true macromutations at all. They are only macromutations if we look, naively, at the finished product, the adult. If we look at the _processes_ of embryonic development they turn out to be micromutations, in the sense that only a small change in the embryonic _instructions_ had a large apparent effect in the adult. The same goes for antennapaedia in fruitflies and the many other so-called 'homeotic mutations.'"

Remember, though, that the downside to gradualism (in terms of relative probability) is that a huge number of consequent percentage chances must succeed, which still reduces the probability of the final product by a significant amount (though still, perhaps, relatively more probable than naturalistic saltationism.)

Having finished his digression into saltatory evolution (which he'll henceforth refer to as "true saltation"), Mr. Dawkins now turns to an examination of 'punctuationism' itself.

p 236, "The 'gaps' that Eldredge and Gould and the other 'punctuationists' are talking about, then, have nothing to do with true saltation, and they are much much smaller gaps than the ones that excite creationists."

Well, actually the only gap Mr. Dawkins has mentioned thus far is the Big Gap prior to the Cambrian Explosion; we haven't really been told of the other 'gaps', nor of their relative size. Perhaps this is a cut-n-paste editing error; surely he'll get around to it in a few paragraphs. [Hindsight note: actually, he doesn't.] In the meantime, the smaller gaps _are_ the ones which excite creationists, if I understand correctly, since it doesn't take a great intellect to figure out that large gaps might be made by long-term environments unsuitible for fossil development (and thus couldn't be used against evolutionary theories by opposing creationist theories.)

p 236, "Moreover, Eldredge and Gould originally introduced their theory, _not_ as radically and revolutionarily antipathetic to ordinary, 'conventional' Darwinism--which is how it later came to be sold--but as something that

followed from long-accepted conventional Darwinism,
properly understood."

And correcting our misimpressions about this is, I must
say, something Mr. Dawkins not only should do, but should
be able to do. But first, another digression into a
definition and discussion of "speciation":

p 237, "Speciation is the process by which a single species
becomes two species, one of which may be the same as the
original single one."

Maybe that should read, 'one of which may _stay_ the same
as the original single one.' Unless every member of the
ancestral species dies out immediately after the mutant
enters the gene pool, the ancestral species will stay
around a while. This is only a minor grammatic quibble,
though.

Here's the potential problem with speciation: the new
mutant varient must be capable of interbreeding with
members of the parent species, otherwise the mutation will
never get off the ground (so to speak.) A human mutant who
had, say, siliconized skin (just to pull a comic-book-level
example out of the air) might be far more suited to survive
and replicate than the rest of us, but he couldn't be the
father of a new siliconized species of humanity unless he
could marry (or 'breed with', if you prefer) a human woman,
who will (by default) be otherwise a normal human. But if a
minor-enough mutation occurs for interbreeding to be
possible, then what happens to the mutant's genes as they
wash through the vast pool of otherwise 'normal' genetic
material over the generations? Or, as Mr. Dawkins puts it:

p 237, "We can imagine the would-be ancestors of the lions
and the would-be ancestors of the tigers failing to split
apart because they keep interbreeding with one another and
therefore staying similar to one another."

Of course, just to remind us where he's coming from, he
immediately adds:

p 237, "Don't, incidentally, read too much into my use of
words like 'frustrated', as though the ancestral lions and
tigers, in some sense, 'wanted' to separate from each
other. It is simply that, as a matter of fact, species
obviously _have_ diverged from one another in evolution,

and at first sight the fact of interbreeding makes it hard
for us to see how this divergence came about." [italics
his]

And now, just to remind you where _I'm_ coming from, let me
immediately restate that paragraph: 'Don't, incidentally,
read too much into my use of phrases like "What needs to be
said now, loud and clear, is the truth" [p 251], as though
I, in some sense, 'wanted' to write TBW. It is simply that,
as a matter of fact, this book obviously _is_ presenting
valid truth claims, and at first sight the fact of ultimate
nonintentionality makes it hard for us to see how this book
could possibly be true.' (Note: obviously this restatement
uses a hindsight quotation I discovered near the end of the
chapter; I thought it fit in quite well so I replaced my
original choice.)

Setting aside that perennial thorn again, Mr. Dawkins goes
on to illustrate how "orthodox neo-Darwinism" deals with
the interbreeding problem.

p 238, "Here, then, is our orthodox neo-Darwinian picture
of how a typical species is 'born', by divergence from an
ancestral species. We start with the ancestral species, a
large population of rather uniform, mutually interbreeding
animals, spread out over a large land mass. They could be
any sort of animal, bet let's [use] shrews. The landmass is
cut in two by a mountain range. This is hostile country and
the shrews are unlikely to cross it, but it is not quite
impossible and very occasionally one or two do end up in
the lowlands on the other side. Here they can flourish, and
they give rise to an outlying population of the species,
effectively cut off from the main population. Now the two
populations breed and breed separately, mixing their genes
on each side of the mountains but not across the mountains.
As time goes by, any changes in the genetic composition of
one population are spread by breeding throughout that
population but _not_ across to the other population. Some
of these changes may be brought about by natural selection,
which may be different on the two sides of the mountain
range: we should hardly expect weather conditions, and
predators and parasites, to be exactly the same on the two
sides. Some of the changes may be due to chance alone.
Whatever the genetic changes are due to, breeding tends to
spread them _within_ each of the two populations, but not
between the two populations. So the two populations

diverge genetically: they become progressively more unlike each other." [italics his]

Eventually, Mr. Dawkins suggests, they'll become so different that they are incapable of interbreeding, so that should their populations mix once more, the gene pools remain effectively separated. This explains how two concurrently existent species can have one ancestral species. (We don't need to bring in serious geographic differentiation to follow one species simply turning into another.)

I have only one (minor) problem with this theory. It seems, on the face of it at least, that the theory requires some serious _inbreeding_ (as opposed to interbreeding) among a limited set of genetic variants to work. For example, two shrews (or one pregnant shrew) makes it across the mountains. Its, or their, children survive--but with whom do they mate? It can only be with the siblings and parent(s). We know from other cases of inbreeding that such processes, at best, don't provide the sort of secondary physical variations we see in other species; and at worst they result in genetically crippled individuals. One well-known example are the cheetahs, who have very few physical differences between individuals and apparently some genetic diseases, which have led some biologists to consider them an inbred race. The old "backwoods" hick stereotype raises its head, too; it may not be flattering, but it's based on more than just irrational prejudice. The only way to avoid this is to have enough of a commerce across the mountains to keep the gene pool fresh, but that exposes the second population to any mutational variations going on in the first. Or, the second population might be started by several pairs of animals at the same time, which seems a better fix. At any rate, this is not a super-serious problem with the theory; there should be plenty of procedural workarounds which get past this problem. But it would help if, in a future edition, they were discussed.

One of the reasons we have to bring in something like geographical isolation to explain the concurrent existence of two species variants is because:

p 239, "[T]he likelihood is that the two species would not coexist for very long. This is not because they would interbreed but because they would compete. It is a widely accepted principle of ecology that two species with the

same way of life will not coexist for long in one place, because they will compete and one or other will be driven extinct."

Not that this apparently excuses the Australian ranchers, of course. Note that it shouldn't matter how differentiated the species is (after all, we all descend from one or a few very closely related species of bacteria, or some such thing.) The principle is the same; species in conflict for similar resources (even if they want the resources for different purposes) tend to drive one another to extinction. Of course, I've beat this drum long enough for you to be intimately familiar with the concept; I only wanted to point out that here's yet another confirmation that this sort of thing happens _naturally_ (and thus blamelessly--at least as far as naturalism is concerned.)

So, Mr. Dawkins goes on to explain that what the 'punctuationists' did was:

p 239, "...to ask themselves: Given that, like most neo-Darwinians, we accept the orthodox theory that speciation starts with geographical isolation, what should we expect to see in the fossil record?"

Which points out again for us that the punctuationists weren't trying to rock the fundamentals of Darwinian theory; they were only trying a new explanation of data from _within_ the theory. At least at first they did; according to Mr. Dawkins, Gould and Eldredge eventually broke ranks with the orthodox Darwinians for purely publicity-related reasons.

So what did the punctuationists originally propose?

p 240, "The 'gaps', far from being annoying imperfections or awkward embarrassments, turn out to be exactly what we should positively _expect_, if we take seriously our orthodox neo-Darwinian theory of speciation. The reason the 'transition' from ancestral species to descendant species appears to be abrupt and jerky is simply that, when we look at a series of fossils from any one place, we are probably not looking at an _evolutionary_ even at all: we are looking at a _migrational_ event, the arrival of a new species from another geographical area." [italics his]

In other words, (as Mr. Dawkins himself puts it a bit
earlier), when we dig up shrew species A fossil-sites,
later layers may show us an 'abrupt' shift to species B
fossils because species B suddenly (in terms of
geographical time) turned back up to compete for resources.
Of course, Mr. Dawkins implies that we could see the
gradual changes if we wanted to--by digging on the other
side of the mountain. One thing I note, though; he hasn't
yet said that we do, in fact, _find_ gradual changes in
this fashion (or any other fashion.) Maybe he'll get to
that before the end of the chapter.

On the other hand, maybe not: in his imagined restatement
of what Gould and Eldredge could (and apparently _should_?)
have said about the fossil record in defending Darwin, Mr.
Dawkins states:

pp 240-241, "... even if we are fortunate enough to dig in
one of the small outlying areas where most evolutionary
change went on, that evolutionary change (though still
gradual) occupies such a short time that we should need an
extra _rich_ fossil record in order to track it!" [italics
his]

Now, maybe I'm reading this wrong--hopefully we'll find out
later--but that certainly looks like an explanation that
the fossil record we do have is not inconsistent with
evolutionary theory; _because_ we in fact don't have a
positive fossil record to illustrate the sort of changes
we're saying happened. Certainly, Mr. Dawkins must show
that the theory happens to fit the data--it has to be done,
because a theory not fitting the data would be in ruins--
but that's not the same as claiming that the data
positively _backs_ the theory. It means that, at _best_, an
anti-evolutionist can't use the fossil record against neo-
Darwinism--at least not like this (if at all.)

Anyway, according to Mr. Dawkins, Gould and Eldridge didn't
take this moderate route.

p 241, "But no, instead they chose, especially in their
later writings in which they were eagerly followed by
journalists, to sell their ideas as being radically
opposed to Darwin's and opposed to the neo-Darwinian
synthesis. They did this by emphasising the 'gradualism' of
the Darwinian view of evolution as opposed to the sudden,

jerky, sporadic 'punctuationism' of their own." [italics
his]

Mr. Dawkins says that some of them, especially Gould, drew
analogies between themselves and the old schools of
saltationism and 'catastrophism'.

p 241, "Catastrophism was an eighteenth- and nineteenth-
century attempt to reconcile some form of creationism with
the uncomfortable facts of the fossil record.
Catastrophists believed that the apparent progression of
the fossil record really reflected a series of discreet
creations, each one terminated by a catastropic mass
extinction. The latest of these catastophes was Noah's
flood."

Of course, what he doesn't mention is that the fellow who
invented the science of palaeontology, Cuvier, was himself
a catastrophist in terms of explaining the fossil record;
though I'm unsure whether Cuvier attached any religious
significance to it.

As Mr. Dawkins has amply demonstrated:

p 241, "Comparisons between modern punctuationism on the
one hand, and catastrophism or saltationism on the other,
have a purely poetic force. They are, if I may coin a
paradox, deeply superficial. They sound impressive in an
artsy, literary way, but they do nothing to aid serious
understanding, and they can give spurious aid and comfort
to modern creationists in their disturbingly successful
fight to subvert American education and textbook
publishing."

The last remark, by the way, reminds me of an old joke
dating back to the pre-Holocaust Jewish 'ghettos' in
Germany. A man walks up to his friend, and is amazed to
find him reading an anti-Semitic magazine--the Jews are
responsible for this, the Jews are doing that (both men in
the joke are Jews themselves.) "What are you doing!?"
exclaims the first man. "How can you stand to read that?"
"Well," humphs the second man, "I always like to find out
how powerful we are."

Meanwhile, how shall we interpret Mr. Dawkins' disturbance
at our (apparent?) success in keeping evolutionary theory
down--not that I've ever seen much of that, but he's more

widely travelled than I am. Let's assume for the sake of
argument that creationism of _any_ sort is incorrect--
that's certainly the thrust of his book. Is Mr. Dawkins
saying, 'It is _wrong_ for creationists to keep this
knowledge from the public'? Or is he saying, 'When I
consider them keeping that knowledge from the public, I get
a funny tense feeling, due to my genetic makeup and the
conditioning I've had from my environment as I've grown
up'? If he's saying the second, so what? He should take an
antacid or something. If he's saying the first, how does he
link that up in a legitimate way with his own theories?

Setting aside _that_ perennial thorn as well, Mr. Dawkins
has now completed the underlying structure of his argument
showing us that:

p 241, "[I]t is not really the _gradualism_ of Darwin that
the punctuationists oppose: gradualism means that each
generation is only slightly different from the previous
generation; you would have to be a saltationist to oppose
that, and Eldredge and Gould are not
saltationists."[italics his]

Hindsight note: actually, strictly speaking Mr. Dawkins
himself _also_ opposes it without being a saltationist--he
doesn't necessarily think that _every_ (or _each_)
generation really _is_ slightly different from the previous
one. We'll get to that in a minute, though. (pp 242-243)

p 241, "Rather, it turns out to be Darwin's alleged belief
in the constancy of rates of evolution that they and the
other punctuationists object to. They object to it because
they think that evolution (still undeniably gradualistic
evolution) occurs rapidly during relatively brief bursts of
activity (speciation events, which provide a kind of crisis
atmosphere in which the alleged normal resistance to
evolutionary change is broken); and that evolution occurs
very slowly or not at all during long intervening periods
of stasis."

However, this doesn't sound like a particularly orthodox
theory of 'evolution'. It sounds like he's saying they
believe 'evolution' to be the _displacement_ of species by
other species in a (relatively) rapid event; but isn't this
different from the 'other' evolution which is going on
normally to produce the two differentiated (but
geographically separated) species? Well, maybe not;

'evolution' is a total package _including_ natural
selection principles, and the displacement would certainly
be a (rather catastrophic) instance of natural selection.

Next up, Mr. Dawkins introduces a "thought of the famous
American evolutionist G. Ledyard Stebbins", which he
considers "illuminating" (I guess Stebbins' thought was
not produced by nonrational environmental reactions and
counterreactions, then!) It is an interesting example, but
Mr. Dawkins doesn't qualify it properly. In fact, it may
end up sinking something else he wrote earlier.

Stebbins wanted to illustrate how a dramatic change could
take place, even using 'gradualistic' methodologies, in a
geographically brief span of time--a span shorter than the
geological record could account for. He took a mouse
(weighing 40 grams) and calculated how long it would take
to change, as a species, into something the size of an
elephant (weighing 6,000,000 grams.) Certainly a major
shift, eh? Stebbens wanted to be fair; he assumed a
terribly gradual change, so slight that within the lifetime
of one human it would not be noticeable, and so (to the
human observer) it would not seem to be evolving. Given
this rate of change (says Stebbens, and vouched for by Mr.
Dawkins), and given an average generation time-span of 5
years (apparently some sort of weighted average between a
mouse's and an elephant's), how long would the mouse take
to evolve into an elephant-size? Let's see the figures
themselves from Mr. Dawkins; and pay close attention!

p 242, "How long would this take? Obviously a long time by
human standards, but human standards aren't relevant. We
are talking about geological time. Stebbins calculates that
at his assumed very slow rate of evolution, it would take
about 12,000 generations for the animals to evolve from an
average weight of 40 grams (mouse size) to an average
weight of over 6,000,000 grams (elephant size). Assuming a
generation-time of 5 years, which is longer than that of a
mouse but shorter than that of an elephant, 12,000
generations would occupy about 60,000 years. 60,000 years
is too _short_ to be measured by ordinary geological
methods of dating the fossil record." [italics his]

Now, this example reminds me of a trick question from a SAT
or ACT test; a lot of figures are thrown around, and some
of them do tally up (5 years-per-generation times 12,000

generations does equal 60,000 years), but let's check out the implications of the example, shall we?

Average ending weight: over 6,000,000 grams. We'll be conservative and shorten that to six million, but remember that it's actually _more_ than that. Average starting weight, 40 grams. Difference between average ending and starting: 5,999,960 grams. That's a long way to go. How many years does this take? 60,000 years. That's a pretty long time for us, but as Mr. Dawkins notes it's virtually instantaneous in geological time. What's the average change in size per year? Not hard to find out: 5,999,960 grams divided by 60,000 years equals **100 grams per year**. Of course, that's not quite right; we need to know what the average size changed per generation. 100 grams per year times 5 years equals 500 grams per generation, on average. How long would a biologist spend tracking this species in a career? Let's say only twenty years; though I'm related to one practicing (and teaching) biologist who looks as though he could end up following the local reptile populations at least half-again as long. 20/5 equals four generations for our evolving mice. Four generations times 500 grams per generation equals 2000 grams, or 2 kilograms average weight change. Now, if Mr. Dawkins and Mr. Stebbens want to claim that a practicing biological researcher wouldn't notice something like that at _any_ stage (specifically I'm thinking of the mouse-size stage), then I'm not sure why we would accept a biologist's competence on 'weightier' matters, even presuming they were better qualified to speak on them than, say, a metaphysician.

Have I jinked up their example unfairly? Not at all; the mouse will have a much shorter generation-span than five years, but then again that gives the biologist that many more generations in _his_ lifespan to catch the change. If the mouse changes too slowly for a biologist to notice in 20 years, then the rate must be made up for later, perhaps with near-elephantine mice that grow a few thousand kilograms per late generation. And, of course, their example also assumes that no one is keeping records (particularly the biologist) for future generations to check by. Are they seriously suggesting that human observers, as a whole, wouldn't figure _something_ was up over 6000 years or so? Or, for that matter, even over 200 years?

Am I picking too harshly on their constraint that observers
would _never_ notice it? Again, not at all. _They_
introduced the constraint, implicitly so they could show
that it might be going on now, for all we know. They
probably made the example too farfetched; but they wanted
to show that even farfetched examples could be carried by
the theory, though apparently they can't. This example
needs to be drastically reworked, or abandoned.

By the way, _do_ we have evidence that such things are
going on now? If so--if we have a few insects or lizards or
such that we've decided are developing this quickly without
our interference (breeding cats doesn't count)--then, are
the examples proportionate to what we would expect given
the number of species we know about, etc.? And if so, why
bring up an example like this one, dedicated to convincing
us (or at least trying) that such things could be happening
without our awareness?

But the problems don't stop there. Biological evolutionists
(and, for that matter, philosophical evolutionismists)
believe that, as a matter of fact, elephants (like every
other mammal, us included) evolved from earlier mammals
which were not far from mouse-sized to begin with. Mr.
Stebbins calculated 12,000 generations to get from mouse-
to elephant-sized. Let us simplify the problem in their
favor, and assume that we're not just talking size but
all the other dramatic differences between elephant and
proto-mammal physiology; all this can be done in 12,000
generations, and not more. Ah, but if you'll recall earlier
chapters, Mr. Dawkins gave us an estimate on the
probability of a mutation as 1-in-a-million. As I did
before, let's simplify matters in his favor, and assume
that we don't have to worry about competing species (i.e.,
the new species gets going but dies out from competition),
or survival factors (as I noted in the earlier chapter the
odds regarding a successful transfer of new DNA to a viable
gene-pool replicator are actually a fraction of a fraction
of a fraction... etc., etc.,... of 1:1,000,000.) Let us
assume that every chance mutation is a success at getting
itself into the gene pool.

Washing the pros and cons out, I think it entirely
reasonable for us to grant that 1:1,000,000 chance of
successful mutation per generation is perhaps even
conservatively generous towards Mr. Dawkins (though I think
I originally gave him even better odds than that.) How many

generations, then, may we expect to take between mouse-sized protomammal and elephant? On the average, it would be 12,000 times 1,000,000. Multiply the 1 by 12, add three zeroes to the million, and we have 12,000,000,000 generations. That's **TWELVE BILLION** generations! Ah, but a generation under the above example is not one year; it's actually about 5. According to their own math, under conditions which are (if anything) favorable to their theory, the change between protomammal and elephant would take, on the average, **60 BILLION YEARS**!! That's at least six times the current estimated age of the universe itself. And I'm assuming that Mr. Dawkins considered his own example to have built-in cumulative selection processes; so there's no point complaining about single-step selection (or event) bias. Now, I'm not _exactly_ sure how long elephants have been around (at least 12,000 years, I'm told); and I'm not _exactly_ sure how long ago the protomammals are supposed to have lived (during the Cretaceous period, I'm told), but I think we're talking 100 million years of development at the outside here. Does anyone else see a monstrous gap in the numbers?

Obviously, someone's numbers need adjusting. Maybe all we're looking at is a very poorly thought-out example from Mr. Dawkins; but then, so much for any point he was trying to make with it. I'll also ask you, the reader, to remember that I've been trying very hard to give biological evolution, as a science, every break I could think of. I grew up learning evolution as a science (yes, it's taught down here in the backwoods), and I've gotten comfortable with it. I'm certainly not going to cry if it's chunked, but since I've managed to easily synthesize my creationistic beliefs with the _science_ of evolutionary biological theory, then my motivation leans toward keeping it. Mr. Dawkins is not doing a bang-up job reinforcing my already existant preference for the science as a theory.

Meanwhile, Mr. Dawkins takes the opportunity to clear up a misconception I noted earlier:

p 242, "Whatever we may think of the theory of punctuated equilibria itself, it is all too easy to confuse gradualism (the belief, held by modern punctuationists as well as Darwin, that there are no sudden leaps between one generation and the next) with 'constant evolutionary speedism' (opposed by punctuationists and alledgedly,

though not actually, held by Darwin.) These are not the same thing at all."

I have to admit that I've caught otherwise-well-informed advocates on my side confusing those two terms, so Mr. Dawkins' correction must be taken fairly, and consistently applied by our side in the future. At least, I think it makes sense to do so.

Mr. Dawkins illustrates how Mayr's theory of speciation contained within it an important (though as Mr. Dawkins notes, much disputed) emphasis on what Mr. Dawkins re-pictures as 'species inertia'. According to this theory, large populations (like those of Shrew Species A in Mr. Dawkins' shrew-exodus example, to coin a phrase) have a tendency to resist the pressures of natural selection on mutated genetic strains; and this resistance is relatively more effective than any given smaller population of the same species (other things being equal, meaning we're temporarily discounting the effects of different environments on different populations, for instance.) That being the case, Mayr would expect the shrew-exodus population, which consists of a smaller population than the shrew-species homeland, to evolve faster. Thus, using the characteristics of the main population at the time of the minor exodus as a baseline, the main population over time would likely be relatively 'static', compared to what's happening with the shrews-over-the-mountain (who are turning into Species A1.)

Mr. Dawkins tells us that the punctuationists focused on this relative 'stasis' of the larger population, and then:

p 243, "...exaggerated it into a strong belief that 'stasis', or lack of evolutionary change, is the norm for a species. [Proponents of punctuated equilibria] believe that there are genetic forces in large populations that actively _resist_ evolutionary change." [italics his]

Of course, as Mr. Dawkins frequently points out, the genetic forces involved aren't really initiating actions; but I can't tell from his comments here whether he's attributing this belief to the punctuationists, or whether he's being conveniently metaphorical again. Given some of the ways I've seen naturalists using that sort of metaphor, it wouldn't suprise me to learn that punctuationists did just that. (Hindsight note: on p 246, Mr. Dawkins writes of

punctuationists, discussing their view of a population's
resistance to evolutionary change, "It is almost as though
species are thought to take active stepts _not_ to evolve,
in spite of driving forces in favour of evolution."
[italics his])

p 243, "Speciation [for the punctuationists] is a time of
upheaval, or revolution. And it is during these times of
upheaval that evolutionary change is concentrated. For most
of the history of a lineage it stagnates."

Strictly speaking, that doesn't look quite like how Mr.
Dawkins presented the punctuationist's case earlier. It
seems a punctuationist would say that the evolutionary
change itself is not concentrated during the time of the
upheaval or revolution; but that the upheaval or revolution
occurs (and thus accounts for the fossil records) _because_
some concentrated evolutionary change occured _before_ the
species-war begin. Otherwise, the new fast-evolving
population might just as well go on living succesfully on
the other side of the geographical divide without
displacing the older population at all; yet a new species
type (under this theory) would still pop into existence in
a geographically instantaneous blip of time. Concurrently,
one would think the second population was also growing as
it became more succesful at existing in its new
environment. Thus, it would eventually reach a population
level at which it would also stagnate (according to the
exaggerated emphasis punctuationists put on Mayr's side-
theory, as Mr. Dawkins has just explained.)

What about Darwin? What was his opinion about evolutionary
development rates?

pp 243-244, "It isn't true that Darwin believed that
evolution proceeded at a constant rate. He certainly didn't
believe it in the ludicrously extreme sense that I
satirized in my parable of the children of Israel..."

Nor,I suppose, would Darwin have believed in the
similarly ludicrously extreme sense which Mr. Dawkins
presented on page 242 with the 12,000 generations of mouse-
to-elephant-sized mammal development, taken from G. Ledyard
Stebbins. Of course, I didn't get the impression from that
extended paragraph that Mr. Dawkins was presenting _it_ as
a satire; more like a good example of how fast major
changes can take place. Go back and read it for yourself,

and see if _you_ can find anything in that paragraph (or
afterwards to this point) that indicates Mr. Dawkins
disapproved of his Stebbins example--an example which
necessarily requires (as I pointed out through calculation)
that _every_ generation have either a fairly substantial
constant rate of change, or that incredibly vast changes
take place in some few select generations.

Setting aside _that_ potential problem as well (we seem to
be doing that a lot in TBW, hmm?), we find Mr. Dawkins
presenting us (on page 244) with a clever bit of textual
criticism, which shows he's not utterly ignorant of the
general principles. Apparently, Mr. Dawkins (or someone)
replied to Gould's insinuation that Darwin believed in
constant evolutionary change by quoting a "well-known
passage" introduced in the fourth edition of _The Origin of
Species_, which states Darwin's belief that a.) many
species once formed _never_ undergo any further change
[emphasis mine], and b.) the years in which they do change
are probably short compared with "the periods during which
they retain the same form."

Gould's reply was apparently that Mr. Dawkins (or whomever)
had taken one select quotation of Darwin's out of the
context of his whole work and set it up as 'evidence' of
what Darwin believed his theories implied. But Mr. Dawkins
notes Gould's mistake: Gould wants to know if Darwin's
contemporaries or descendants ever read Darwin as a
saltationist?

Mr. Dawkins correctly replies (as far as I can tell) that
of course no one ever read Darwin as a saltationist, and in
fact Darwin himself was "consistently hostile to
saltationism" [p 244]; but that's a moot point because
saltationism is _not_ punctuationism. In other words, Gould
attempted to change what Mr. Dawkins was asserting, and
defending, from Type 'A' idea to Type 'B' idea, so that
Gould could (with prima facie plausibility) deny that
Darwin believed Type 'B' idea (saltationism) and thus Mr.
Dawkins was wrong. But, to borrow a phrase often used by
Mark Twain, Mr. Dawkins was "too many for him", caught him
making the switch, corrected the definition of what he was
asserting and defending, and thoroughly nipped Gould in the
chops. Ta-daaa!

Not long afterwards, Mr. Dawkins wrote chapter 6 of TBW,
wherein he surriptiously redefines the term 'miracle' to

mean something totally different from what the
supernaturalists are claiming and trying to defend. The new
meaning happens to be (how convenient!) something which can
be dismissed as a bad bet probabilistically, which is a
chief theme of TBW. Then another author comes along,
catches him making the switch, corrects the definition back
to its proper mode, and observes that Mr. Dawkins' entire
chapter-long attempt to remove supernatural creationism
from the playing-field falls to the ground. Ta-daaa! Here's
hoping my editors prevent me from making a similar mistake
before _my_ book goes to print...

p 244, "I think it would clarify matters if, at this point,
I summarized a range of possible points of view about rates
of evolution."

This delinearizing of terms takes place over the next few
pages, and can be re-summarized as follows:

a.) True saltationism. "True saltationists don't exist
among modern biologists. Everyone that is not a
saltationist is a gradualist, and this includes Eldredge
and Gould, however they may choose to describe themselves."
[p 244] To a saltationist, large developmental jumps are
taken between individual generations.

b.) Discrete variable speedism. This is the direction that
Eldredge and Gould lean to, according to Mr. Dawkins (p
245). Evolution has only a limited set of discretely
obvious speeds, fast and extremely slow (in their view).
However, even the fast speed is only fast compared to
geological timescales, and still requires very minor
changes per generation. Thus, it is 'gradualistic' as
opposed to 'saltationistic'.

c.) Continuous variable speedism. The advocates of this
view "see no particular reason to emphasize certain speeds
more than others" (p 245), and "believe that evolutionary
rates fluctuate continuously from very fast to very slow
and stop, with all intermediates." To this advocate, stasis
is just one more speed of evolution--"ultra-slow"--and as
such is nothing special. Puncutationists believe something
a bit different about stasis, as we'll get to in a moment.
Mr. Dawkins, as far as I can tell, is an advocate of this
view.

d.) Constant speedism. This is the sort of development cariacturized by Mr. Dawkins' presentation of the Exodus story at the beginning of this chapter. This advocate believes "that evolution is plodding along steadily and inexorably all the time, whether or not there is any branching going on. He believes that quantity of evolutionary change is strictly proportional to time elapsed." Though Mr. Dawkins notes that some modern molecular geneticists can make a good case for this sort of thing going on at the level of protein molecules, that doesn't necessarily mean the "large-scale structures and behaviour patters" would follow suit. "[J]ust about all evolutionists would reject constant speedism, and Darwin certainly would have rejected it." (p 245)

As I noted a minute ago, a view like this seems necessary for the Stebbins analogy to make the point Mr. Dawkins apparently wanted it to make back on p 242. Therefore, if we accept Stebbins' conclusions about necessary rates of change as presented in his example (and Mr. Dawkins nowhere gives us explicit reason to doubt that he accepts this himself), then the point of this example--that gradualist evolutionary processes _can_ produce large-scale changes below the fossil record's 'level-of-perception' (so to speak)--stands refuted by Mr. Dawkins' own position regarding such change.

However, to be fair, Mr. Dawkins might be able to reply that he intended the Stebbins example to illustrate only a _particular incident_ of 'very fast' evolution within continuous variable speedism (which he accepts). If he does, I'll give him that credit, though he might wish to make the point clearer in his next edition of TBW (assuming there will be one). Granting him this point, though, does _not_ change the fact that he must have left out the 1:1,000,000 odds of genetic mutation as a factor in the Stebbins example, which is the only way (mathematically) he can get the changes to happen quickly enough to make his point. Perhaps Mr. Dawkins would like to calculate the odds that 12,000 successive generations of mammals in a single species would consistently beat the 1:1,000,000 odds of genetic mutation which he himself introduced earlier in his book to bolster a different point. That might help his example look stronger, though it seems to me such odds would be equal to 1-to-one-million-times-itself-twelve-thousand-times, or roughly 1×10^{72000} against it happening-

-which looks to me like massively worse odds than even his
fallacious restatement of 'miracle'!

Of course, that's not quite fair, since we've got more than
one species on the planet. Let's say we've had 10 billion
species in the history of our planet; that's probably way
overestimating the number, but let's be even more
conservative and say Mr. Dawkins corrects me: we've
actually had 100 billion species. In fact, let's get even
more conservative and pretend that all these species
existed at the same time throughout Earth's entire history.
100 billion is 1x10^11. If Mr. Dawkins wants to divide this
back into the previous probability estimate (although I'm
not sure doing that will be a mathematically 'legal' way of
helping his estimate), you can get an idea of _how much_ it
helps by subtracting 11 from 72,000. In fact, he can try
dividing in all sorts of estimates: the ages of the earth
and the universe, a flat guesstimated average number of
individuals per species, number of fertilized eggs per
species, etc., etc., ad nauseam. Most of them won't be
legally divisible in a sense which provides the proper
context of probability, but let him do it anyway. Heck, let
him double up on us occasionally and repeat some he's
already factored in! The fives and eights and elevens and
twenties are constantly subtracted from that 72,000. Let's
even say that at the end of the day, he's managed to factor
in enough variables such that the number of zeroes after
that 1 are reduced by ten thousand (that's a lot of fives,
eights, and elevens!) We would still only expect something
like Stebbins' example to happen once in about a trillion,
trillion, trillion, trillion (insert another five thousand
one hundred and sixty 'trillions' into the list here)
trillion, trillion years. Plus maybe another six hundred
and sixty-six billion years (another 2/3 trillion). The age
of our universe is less than 20 billion years, by current
estimates. Under this plan, which resembles how Mr. Dawkins
has been getting his timing estimates, I should expect to
see his famous statue not just wave her hand, but signal
"METHINKS IT IS LIKE A WEASEL" in American Sign Language
due to purely natural causes, maybe more than once, before
a single species does what Stebbins suggested (with what
appeared to be Mr. Dawkins' tacit agreement)! Fortunately,
as a supernaturalist, super-duper-ultra-whizbang
naturalistic anti-probabilities don't mean much to me. I'd
rather get the philosophical issues hammered out first and
then check to see what the existent empirical evidence (and

not the hypothesized-to-fit-the-preconception-and-
otherwise-nonexistent evidence) tells us!

Let's turn now to Mr. Dawkins' lecture on what 'stasis'
means to a punctuationist vs. a 'continuously variable
speedist'. Mr. Dawkins states that, "More biologists agree
that stasis is a real phenomenon than agree about its
causes." One of the bits of empirical evidence which helped
biologists come to this conclusion is the _Latimeria_
coelacanth, a modern-day descendent of a fish-like species
(Mr. Dawkins notes they're more closely related to us than
modern fish) which was thought to have died out during the
time of the dinosaurs (more than 200 million years ago.)
Mr. Dawkins notes that this is a real species, with a real
habitat, and enough specimens have been fished up from its
home off the South African coast (near Madagascar if I
remember correctly) since 1938, for it to be properly
studied and described. "It is a 'living fossil', in the
sense that it has changed hardly at all since the time of
its fossil ancestors, hundreds of millions of years ago."
(p 246) This species helped push the theory of evolutionary
stasis from the abstract to the empirical. And Mr. Dawkins
asks the proper scientific questions at this point:

p 246, "So, we have stasis. What are we to make of it? How
do we explain it?"

The answers illustrate how science often operates: we
discover the empirical data, and then we see how the data
can be fit into currently accepted theories. And as Mr.
Dawkins illustrates, both gradualists and punctuationists
can fit the coelacanth into their theory quite well.

p 246, "Some of us would say that the lineage leading to
Latimeria stood still because natural selection did not
move it. In a sense it had no 'need' to evolve because
these animals had found a successful way of life deep in
the sea where conditions did not change much. Perhaps they
never participated in any arms races. Their cousins that
emerged onto the land did evolve because natural selection,
under a variety of hostile conditions including arms races,
forced them to."

Though of course, Mr. Dawkins doesn't really mean "forced
them to" any more than he thinks there are truly "active
forces of resistance" to evolution--the latter is a
punctuationist idea, as we shall see. In passing, he also

suggests as an addendum on p 247 that it's technically
conceivable that coelacanths stopped evolving because they
stopped mutating, perhaps from lack of exposure to cosmic
radiation. This also fits into the theory, technically;
though he also notes that "nobody, as far as I know, has
seriously suggested this."

p 246, "Other biologists, including some of those that call
themselves punctuationists, might say that the lineage
leading to modern _Latimeria_ actively resisted change, _in
spite of_ what natural selection pressures there might have
been." [italics his]

As Mr. Dawkins notes, who is right? How can we tell? Simply
looking at the coelacanth, we can't; its existence fits the
principles of either theory.

Mr. Dawkins suggests that we try an experiment to test what
is, perhaps, the key factor of the punctuationist
hypothesis: "the idea that groups of genes are so well
adapted to each other that they resist invasion by new
mutant genes which are not members of the club." (p 247)
How can we test the hypothesis? Fortunately, the
punctuationists (according to Mr. Dawkins) believe that
"less extreme, and shorter-term, examples of stasis [than
the coelacanth] are commonplace; are, indeed, the norm,
because species have genetic mechanisms that actively
resist change, even if there are forces of natural
selection urging change." (p 247)

This gives us the chance to set up a decades-long series of
experiments in cross-checking whether this inertia exists:
"We can take wild populations and impose our own forces of
selection upon them." (Note that any results from this
experiment will _not_, of course, work very well as
evidence of how effective blind, automatic, nonpurposive
natural process can lead to apparent design, but Mr.
Dawkins isn't trying that right now. I only mention it in
case you've forgotten some of my earlier points.)

p 247, "According to the hypothesis that species actively
resist change, we should find that, if we try to breed for
some quality, the species should dig in its heels, so to
speak, and refuse to budge, at least for a while. [...]
These failures should only be temporary, of course.
Eventually, like a dam bursting under pressure, the alleged
anti-evolution forces will be overcome, and the lineage can

then move rapidly to a new equilibrium. But we should experience at least some resistance when we first initiate a new program of selective breeding."

Mr. Dawkins' point, of course, is that we've never encountered any such resistance; at least, not during official breeding programs where we were keeping records (which are the only ones that can count for this example, for the simple fact that any other attempts left us no records to compare results!) We've been doing this sort of thing for thousands of years, and keeping good records on it for hundreds of years (I should point out that most of the earliest well-attested projects in this vein come from monks and country vicars who certainly had no evolutionary axe to grind!), and no inherent population resistance to our fiddling seems to be present. "Animal and plant species are usually immediately amenable to selective breeding, and breeders detect no evidence of any intrinsic, anti-evolution forces." (p 247)

I thought this was a rather clever rebuttal on Mr. Dawkins' part, but then it occurred to me that he may not be using a level playing field. When Mr. Dawkins says that punctuationists advocate, "the idea that groups of genes are so well adapted to each other that they resist invasion by new mutant genes which are not members of the club" (p 247), he explicitly identifies this as "one of the theoretical props of Mayr's inertia idea, already referred to." The problem is that, as I understood Mr. Dawkins's explanation of Mayr, this sort of thing was inextricably linked to _population size_. That is, the larger the interbreeding population, the more genetic 'inertia' existed against spreading mutations through the gene pool, and vice versa. But that means that the 'experiments' (as Mr. Dawkins coyly describes our selective breeding endeavors) are not comparing apples to apples. Let's take a look:

Selective breeding

Relatively low population.
Artificial culling of specific types so that plants or animals with 'x' characteristic are bred with similar animals.
Highest efficiency possible for breeding certain characteristics true into a limited population.

Population with theoretically high inertia (much resistance
to genetic change)

Relatively high population.
No non-natural culling of specific types (according to Mr.
Dawkins), resulting in a relatively random distribution of
primary and secondary genetic traits. Time required for
genetic mutant penetration into the pool is expanded
greatly; and the probability of total failure for any one
given characteristic becoming dominant, also expands.

Essentially, we again are looking at the biomorph program
results from back in Chapter 4; and once again Mr. Dawkins
is treating the results of a highly artificial experiment
designed on purpose to reach a certain goal as expediently
as possible, as if it reflected natural, automatic, blind,
accidental processes. Selected breeding is a rationally
guided program using limited creature populations by
entities that have at least some idea of what they're
trying to accomplish. This is hardly comparing apples to
apples; more like comparing onions to cans of Mountain Dew.
In fact, the comparisons are so different that I have to
wonder why he bothered to try it.

Also, I should point out in passing (if you didn't see it
yet) that Mr. Dawkins thinks bullfighting is a
"contemptible 'sport'". (p 247) Righteous indignation or
genetic indigestion--which explanation fits Mr. Dawkins'
overall propositions better so far? You make the call! (And
if it's not the first, then Mr. Dawkins is only telling us
something about himself--'Ick! Bullfighting makes my nose
flare!'--and not about bullfighting.) Maybe I should also
point out that, unlike most cattle, the bulls in a
bullfighting ring _do_ have a chance to wreck vengeance on
their tormentor, rather than just get their head knocked in
with a pneumatic hammer while penned in a cage. The reason
people consider it a sport is that they don't consider the
bull to be an entity that _deserves_ a 'sporting chance'
(which in the long run it doesn't have anyway)--something
Mr. Dawkins should understand thoroughly since the bull is
an automatic biological machine. Thus, it's qualitatively
the same sort of 'sport' as logrolling in the American
"backwoods"--the logs will definitely get to the mill, but
the logroller chooses to put himself in a position where
the logs might get him first, and some people find it
entertaining to watch the logroller. Does Mr. Dawkins wish

to suggest, from within a naturalistic framework, in utter
contradiction to everything he's written about animals thus
far in TBW, that the bull _deserves_ not to be tormented
and killed merely for our amusement? I might agree with
that; but then I'm a supernaturalistic theist who believes
that we have a _real_ divinely-given responsibility
relating to such matters.

At the top of page 248, Mr. Dawkins gives a plausible
reason why a species population might not be affected by
natural selection working on mutant offspring:

"[I]f lineages go for many generations in the wild without
changing, this is not because they resist change but
because there is no natural selection pressure in favour of
changing. They don't change because individuals that stay
the same survive better than individuals that change."

He's presenting this as an alternative to the
punctuationist case, and it comes hard on the heels of his
experimental-refutal of inherent species inertia. I've just
noted that his 'refutal' requires that we functionally
equate selective breeding practices with natural genetic
dispersion, and that this hardly seems fair to the
punctuationists even according to his own earlier
representation of their claim; but that doesn't mean I
think his alternative endangered. It has no logical link to
his (apparently faulty) comparison, so it stands on its own
criteria, which seems sensible enough to me. In fact, from
what he's told us, punctuationists should have no trouble
with this either. It's not a mutually exclusive theory set
(at least not in the way he's presented it so far.)

On page 248 we see Mr. Dawkins positioning the
punctuationists once more as emphasising stasis as, "an
active resistance to evolutionary change rather than as,
simply, absence of evolutionary change." After all the
other places where Mr. Dawkins has misrepresented the views
of the opposition in creatively convenient manners, I must
say that I'm highly suspicious of this. For one thing, we
see no quotes from Eldredge, Gould, or any other
'punctuationist' which agree with this interpretation. I'd
like to just take his word that this is what they believe
(or believed), but...? Perhaps in future editions he'll
present some extended quotes from them along these lines.
Shortly, we'll see why this interpretation is 'convenient'

for Mr. Dawkins; and we'll also see why he _really_ believes the punctuationists to be wrong.

Mr. Dawkins builds up to his ultimate refutation of punctuationism (at least as he's presented the theory in this book), in a bit of a roundabout way--which also happens to serve as a summary for the chapter.

First, Mr. Dawkins reminds us once more what saltationism means and what it is:

p 248, "[I]t meant the sudden calling into existence, like Pallas Athene from the head of Zeus, of brand-new complex organs at a single stroke of the genetic wand. It meant fully formed, complex working eyes springing up from bare skin, in a single generation. The reason it meant these things to Darwin [who passionately opposed saltationism] is that that is exactly what it meant to some of his most influential opponents, and they really believed in it as a major factor in evolution."

pp 248-249, Mr. Dawkins notes that at the time saltationism was prominent as a theory, "...people rightly perceived that such instant 'evolution', if it occurred, would imply supernatural intervention: that is what they believed in. [...] [S]altationism is, indeed, just a watered-down form of creationism. Putting it the other way around, divine creation is the ultimate in saltation. [...] [Darwin writes in a letter to Sir Charles Lyell], 'I would give nothing for the theory of Natural selection, if it requires miraculous additions at any one stage of descent.' This is no petty matter. In Darwin's view, the whole _point_ of the theory of evolution by natural selection was that it provided a _non_-miraculous account of the existence of complex adaptation. For what it is worth, it is also the whole point of this book. For Darwin, any evolution that had to be helped over the jumps by God was not evolution at all. It made a nonsense of the central point of evolution." [italics his]

Now, we can see pretty clearly from this that Darwin and Mr. Dawkins both reject saltationism chiefly on _philosophical_ (not scientific) grounds. God doesn't exist; therefore any theory which requires help over the jumps by God is not a valid theory. You will note that the assertion is _not_ something like 'Saltationism simply doesn't fit the data we have, so it's irresponsible to

promote it.' That may, in fact, be the case (though Mr. Dawkins hasn't presented a great deal of argument so far _using_ the extant data.) But this is not the chief reason presented in Mr. Dawkins' book to reject saltationism. For that matter, when Mr. Dawkins writes immediately after this (referring to how the addition of God makes "a nonsense of the central point of evolution"):

p 249, "In the light of this, it is easy to see why Darwin constantly reiterated the _gradualness_ of evolution," [italics his]

he directly implies through the construction and placement of the sentence that Darwin reiterated the gradualness of evolution as a means of standing against creationistic theism. Now, perhaps Mr. Dawkins is misrepresenting Darwin; maybe Darwin had a much more scientific and ideology-neutral set of reasons why he favored gradualism. If so, we're not really being presented with it in TBW.

Mr. Dawkins does illustrate, by the way, that he accepts and agrees with the concept that the data we do have will be and _should_ be interpreted according to the philosophical positions we believe to be true. But we've seen only a bare smattering of straw-man philosophizing in this book so far; nowhere near enough to form an adequate basis for rejecting God at the outset before going to the data, even if the philosophizing that _is_ presented had been particularly cogent (which it hasn't been.)

This section also illustrates a way that Mr. Dawkins could argue the punctuationist belief (if we can trust him to report it correctly at this point) that there are active resistances to evolutionary change. As he noted earlier, someone defending this theory treats the genetic factors _as if_ they could _act_, or initiate action. But of course, whatever else Mr. Dawkins may believe about macroscale behaviours, he has shown himself committed to the proposition that microscale particle behaviors are blind, non-purposive, automatic reactions and counterreactions--a committment which is, as I've tried to illustrate for you, itself grounded on a philosophical presupposition not derived from the evidence but which dictates what the evidence will mean. As Mr. Dawkins himself notes earlier in TBW, assigning real initiative to behaviors at the microscale level means that we're now talking about some sort of theism or pantheism. Mr. Dawkins

rejects any kind of theism; therefore, if the
punctuationists really require some kind of microscale
active influence, they cannot be correct.

Hindsight note: To be fair to Mr. Dawkins, I expected him
to try this against the punctuationists sometime before the
end of the chapter; but as far as I can tell he doesn't try
it. He does try it against the saltationists (as I've just
reported); and you, the reader, might be considering trying
it against the punctuationists. If so, please think about
everything else I've said. The punctuationists might be
wrong, but this is not the way to illustrate it. (Neither
is comparing two significantly different processes as if
they were similar enough to warrant drawing conclusions
from the comparison--as Mr. Dawkins does with selective
breeding and punctuationist theory.)

What is another "fundamental importance of gradualism for
Darwin" according to Mr. Dawkins? That it fits the existent
data more completely than saltationism? Not quite:

p 249, "Darwin's contemporaries, like many people still
today, had a hard time believing that the human body and
other such complex entities could conceivably have come
into being through evolutionary means. [...] They found it
inconceivable that from such simple beginnings something so
complex could emerge. Darwin appealed to the idea of a
gradual series of small steps as a means of overcoming this
kind of incredulity. [...] As we saw in Chapter 3, this
argument overcomes our incredulity only if we stress that
there was an extremely large number of steps along the way,
and only if each step is very tiny."

Also, as we saw in Chapter 3, this argument overcomes our
incredulity if we conveniently ignore the fact that
multiplication of probability involved in an extremely
large number of steps still gives us a massively improbable
final estimate.

pp 249-250, "Incidentally, it is worth quoting J.B.S.
Haldane's characteristic piece of lateral thinking in
combating the same source of incredulity. Something like
the transition from _Amoeba_ to man, he point out, goes on
in every mother's womb in a mere nine months. Development
is admittedly a very different process from evolution but,
nevertheless, anyone sceptical of the very _possibility_ of
a transition from single cell to man has only to

contemplate his own foetal beginnings to have his doubts allayed." [italics his]

Mr. Dawkins notes immediately, by the way, that he's only following whimiscal tradition by talking about ameobas: "A bacterium would be a better choice, but even bacteria, as we know them, are modern organisms."

As long as we're incidentally quoting J.B.S. Haldane's characteristic piece of lateral thinking, it might also be worth noting that if we're going to use that analogy we'd better remember how it _all_ goes: the foetus doesn't come from ultimately simple beginnings, but from fully developed parents who are incomparably more complicated than it is. Concentrating on only one stage of the process is the fallacy of philosophical developmentalism, which Mr. Dawkins has already told us he rejects (hindsight note: he'll do so again in a minor way before the end of this chapter.) Haldane's contemporaries and immediate successors (perhaps most notably C.S. Lewis) pointed this out numerous times. Of course, as long as we remember that the universe itself is massively complicated, the naturalist need not worry much about that particular refutation; at least, unless the naturalist advocates a Big-Bang-from-nothing theory.

So, "[t]o resume the argument", as Mr. Dawkins says:

p 250, "Darwin laid great stress on the gradualness of evolution because..."

Quick, reader, guess why! Because his studies had led him to discover this process empirically taking place?

p 250, "...because of what he was arguing _against_: the misconceptions about evolution that were prevalent in the nineteenth century."

Oh. Well, maybe Mr. Dawkins will tell us later about Darwin's empirical evidence for his theory (he hasn't really bothered to yet.) [Hindsight note: he never does.]

He does, though, summarize once again (on page 250) how Eldredge and Gould (assuming we can trust his presentation of their views) have managed to position themselves as anti-Darwinian.

First, "The _meaning_ of 'gradual', in the context of [Darwin's] times, was 'opposite of saltation.'" [his italics]

Second, "Edlredge and Gould, in the context of the late twentieth century, use 'gradual' in a very different sense. They in effect, though not explicitly, use it to mean 'at a constant speed', and they oppose to it their own notion of 'punctuation'."

Third, they combine the two notions: "They criticize gradualism in this sense of 'constant speedism'. No doubt they are right to do so: in its extreme form it is as absurd as my Exodus parable. But to couple this justifiable criticism with a criticism of Darwin is simply to confuse two quite separate meanings of the word 'gradual'. In the sense in which Eldredge and Gould are opposed to gradualism, there is no particular reason to doubt that Darwin would have agreed with them. In the sense of the word in which Darwin was a passionate gradualist, Eldredge and Gould are also gradualists."

Let's accept the correction of terminology application from Mr. Dawkins (assuming, again, he's represented Eldredge and Gould fairly.) It's a correction worth accepting for fairness sake, and as an apologist for a fully supernaturalistic Judeo-Christianty, I myself have no problem with it. Instead, let's go back for irony's sake and restate Mr. Dawkins' tactics in Chapter 6 (and earlier, but they culminated there) in these terms. I'll be quoting Mr. Dawkins here, but transposing the subjects to fit Chapter 6.

First, "The _meaning_ of ['miracle'], in the context of [supernaturalistic theology], was (and is) 'opposite of [natural].'"

Second, "[Mr. Dawkins], in the context of the late twentieth century, use[s] ['miracle'] in a very different sense. [He] in effect, [and in fact] explicitly, use[s] it to mean ['a massively improbable nature event'], and [he] oppose[s] to it [his] own notion of ['probable natural processes']."

Third, Mr. Dawkins combines the two notions: "[He] criticize[s] [supernaturalism] in this sense of ['massively improbable naturalism']. No doubt [he] is right to do so:

in its extreme form it is as absurd as [his version of the]
Exodus parable. But to couple this justifiable criticism
with a criticism of [supernaturalistic creationistic
theism] is simply to confuse two quite separate meanings of
the word ['miracle']. In the sense in which [Mr. Dawkins
is] opposed to [miracles], there is no particular reason to
doubt that [C.S. Lewis, for instance] would have agreed
with [him]. [Note: and, in fact, Lewis incisively
criticized the application of this sort of naturalistic
definition of 'miracle'.]"

Now, I can't carry the analogy further through the next
sentence, because "[i]n the sense of the word in which"
Lewis, for instance, "was a passionate" supernaturalist,
Mr. Dawkins obviously is _not_. But I _have_ been
highlighting snitches and snatches of Mr. Dawkins' own
positions which indicate, I think, that he ultimately
applies to supernaturalistic grounds to _justify_ his own
positions.

Also, unlike my analogy, Mr. Dawkins' chapter 6 (and
previous chapters, and TBW in general) is not a 'minor
gloss' on supernaturalism. It is an almost utterly
unsupported character assassination; using contradictory
terminological meanings, fortuitous redefinition of
terminology, selective data manipulation, inconsistent
application of proposition consequences, and premises
masquerading as conclusions--all levelled against "naive",
"backwoods" beliefs. I think the reader should ask herself
(as Mr. Dawkins does, regarding punctuationism's anti-
Darwinian marketing), "Why has this happened?"

p 250, "There are people in the world who desparately want
not to have to believe in Darwinism. They seem to fall into
three main classes. First, there are those who, for
religious reasons, want evolution itself to be untrue."

As I've stated time and again throughout this book, I have
no intrinsic problem whatsoever with biological
evolutionary theory, and in fact am fairly comfortable with
it; at least, I was until Mr. Dawkins' sloppy defense of it
in TBW. Ironically, I'm now slightly less sure about it.
Meanwhile, there are some of us who fall in his first
category who disbelieve the _philosophy_ of evolutionism
because it simply fails to make intrinsic sense. That's not
to say that there aren't some people who, for religious
reasons, simply "want evolution itself to be untrue."

However, as long as we're talking about simple wish-
fulfillment, let's remember that there is no psychological
wall preventing a ton of people from simply 'wanting
creationistic theism itself to be untrue', and who will
thus snatch at any straw (or any straw man) they can find
to avoid the implications of that belief. In fact, if the
Oedipal complex is as prevalent as some psychologists seem
to think it is (though I doubt this myself), there's a
massive irrational desire built into all of us to _reject_
God.

p 250, "Second, there are those who have no reason to deny
that evolution has happened but who, often for political or
ideological reasons, find Darwin's theory of its
mechanism distasteful."

I myself have corresponded with several people who have
essentially left the church, not because they have any
reason to deny supernaturalistic theology, but because they
found the mechanism of the church distasteful. I grant
that's not a ringing endorsement for _Christians_ (Ghandi
used to say that he'd have become a Christian except for
the Christians who asked him to leave their church); but
it's not a reason to reject Christianity. Come to think of
it, if all I had to go by was the annoying behavior of some
(not all) of its adherents and political policies, I
wouldn't bother trying to refute naturalism.

p 250, "Of these [second class of people who find the
Darwinian mechanism distasteful and so who desparately want
not to have to believe in Darwinism], some find the idea of
natural selection unacceptably harsh and ruthless..."

See? Mr. Dawkins is ready to argue (in his nonprofessional
life) against boiling lobsters alive; villifies the
Australian ranchers who exterminated the 'thalycid';
considers bullfighting a "contemptible" psuedo-sport; etc.,
etc.; all of which must be taking place under the aegis of
"natural selection" (unless he wishes to posit that Man
somehow supercedes natural processes), and all of which he
obviously finds unacceptably harsh and ruthless. Yet, you
don't see _him_ disavowing Darwinism!

Actually, that's the problem; you don't see him recognizing
the disparity, either. Christians, like some other
creationistic theists, in theory (and often in practice)
have always recognized the disparity of our behaviors

compared to how we _ought_ to behave. We stand condemned
not by an alien code of beliefs, but by our own. In fact,
one of the whole points to being a Christian is recognizing
and professing this fact, and seeking forgiveness and
repentance; that means (in theory at least) admitting we
were wrong and that we shouldn't try to do it again. It
means admitting and recognizing that we _don't_, in fact,
always follow our beliefs about reality. But when we make
these mistakes, we recognize that _we_ are the ones who are
out of sync. We don't blame Reality for not synching with
us (again, at least in theory.) How many times in TBW have
we seen Mr. Dawkins stating, 'Wait, hold up. Sorry about
that. Sometimes I forget that all animals are unconscious
biomechanical entities who can't therefore really deserve
particular treatment. Please charitibly ignore me and
correct me when you see me making those slips'? Zip. Nada.
Zero. As far as you and I can tell, he really, honestly
believes that the bullfighter (for instance) _should be_
treating the bull _better_. He also professes to really,
honestly believe that the bull is an unconscious,
automatic, amoral, biomechanical entity. (Well, maybe
that's part of the problem; he never makes the same set of
assertions about the same animal!) I think if he publishes
another edition of this book, he should call attention to
this himself and settle the problem in some fashion. Maybe
he should start by explaining exactly what his opinion is
about speciest assumptions such as "human rights" and how
it fits into "Darwinism". And then maybe he should continue
by being _consistent_.

p 250, "...others confuse natural selection with
randomness, and hence 'meaninglessness', which offends
their dignity..."

A problem Mr. Dawkins solves--after asserting in numerous
places the ultimate and fundamental nonrational, nonmoral,
blind, nonpurposive character of reality--pretty much by
ignoring the consequences of this position and implying
that humans can give meaning to the universe. How humans,
who are supposedly part and parcel of this same universe,
manage to accomplish this, is one of the gigantic, unstated
leaps being taken throughout TBW. Basically he solves the
problem by not admitting there's a problem! (Alternative
solution from back on p 114: human 'dignity' is a speciest
assumption. I trust none of his numerous awards are
humanitarian awards...)

p 250, "...yet others confuse Darwinism with Social
Darwinism, which has racist and other disagreeable
overtones."

Does that mean we should ignore him when he says we should
ignore the racist assumptions presented back on pages 113-
114? Or not? Can I recourse to the Argument from Personal
Incredulity here? Meanwhile, come to think of it, there are
some people who reject theisms because they confuse the
credible theisms with the fringe cult groups, or assume
that just because the KKK calls themselves 'Christian' (for
instance), that means all Christians are racist. And so
forth. Hey, as Mr. Dawkins shows us here: misidentification
of a philosophy with its more disagreeable (ostensible)
adherents is no reason to reject it! On the other hand,
when he says "disagreeable", what does he mean? It's just
behavioral gas in this instance? Not? How are supposed to
tell, by this point in TBW?

p 250, "Third, there are people, including many working in
what they call (often as a singular noun) 'the media', who
just like seeing applecarts upset, perhaps because it makes
good journalistic copy; and Darwinism has become
sufficiently established and respectable to be a tempting
applecart."

Journalists have been trying to applecart Christianity for
the last 200 years. Every Easter and Christmas you can bet
your bottom dollar that at least two (maybe more) full-
spread articles will appear in major magazines and
newspapers trumpting the latest fad in revisionistic
deconstructive 'explain-it-all-away' Christian theory. This
wouldn't be so bad, except that the theories are so sloppy
and poorly conceived (though presented with "eloquence and
power") that no one should be wasting their time with them.
Heck, some of them were actually soundly refuted almost 100
years ago, yet they're still trotted out today on occasion,
just to see if anyone's watching, apparently. The people
doing the trotting are, often as not, clergy of some sort
themselves; the media just loves this. You never hear of
the detailed responses which thoroughly destroy these
extravagant heresies, because the media doesn't consider
that 'newsworthy'--also because the sad truth is that if an
idiotic theory is ever presented seriously once, it takes
serious scholarship to refute it and that doesn't make for
quick, snappy reading. This is not a new dilemma: as Bishop
Horne wrote in 1831, "Pertness and ignorance may ask a

question in three lines which it will cost learning and
ingenuity thirty pages to answer; and when this is done,
the same question shall be triumphantly asked again the
next year, as if nothing had ever been written on the
subject."

I deplore sloppy work on my side which allows journalists
to present ludicrous anti-"Darwinian" scenarios; it makes
us look like nits (and I pray to God I'm not adding fuel to
that fire). But if Mr. Dawkins expects me to shed tears
for the poor journalistically hounded 'Darwinians', he'd
better pack a lunch and settle in for a long wait. He only
wishes 'Darwinism' was "sufficiently established and
respectable" enough to compete with Christianity as a
journalistic applecart-hunt!

(Frankly, I'd just as soon not sit around comparing 'Woe,
woe, the journalists are after us' stories. It has no
bearing whatsoever on the truth-claims either--or both--
adherents are making. Neither of our sides have been
villified and misrepresented as much as the Celtic druids,
come to think of it...)

p 251, "Whatever the motive, the consequence is that if a
reputable scholar breathes so much as a hint of criticism
of some detail of current Darwinian theory, the fact is
eagerly seized on and blown up out of all proportion. So
strong is this eagerness, it is as though there were a
powerful amplifier, with a finely tuned microphone
selectively listening out for anything that sounds the
tiniest bit like opposition to Darwinism. [...] Needless to
say the amplifier, though powerful is not hi-fi: there is
plenty of distortion! A scientist who cautiously whispers
some slight misgiving about a current nuance of Darwinism
is liable to hear his distorted and barely recognizable
words booming and echoing out through the eagerly waiting
loudspeakers."

Welcome to the party, pal! I'm not denying that sort of
thing happens on occasion, but I suggest the reader replace
'Darwinism' with 'Christianity', and do a search in a
university library among _mainstream_ widely circulated
magazines and papers (_Biblical Creation_ journal doesn't
quite count as either), and find out for yourself exactly
who fits that above description best. (And then, for kicks,
see how many articles you can find with parity of coverage
which respond to the deconstructionists.)

p 251, "Eldredge and Gould don't whisper. They speak out, with eloquence and power! What they say is often pretty subtle, but the message that gets across is that something is wrong with Darwinism. Hallelujah, 'the scientists' said it themselves!"

Let's replace a few nouns in that passage: The 'Jesus Seminar' members don't whisper. They speak out, with eloquence and power! What they say is often pretty subtle, but the message that gets across is that something is wrong with Christianity. Hallelujah, 'the theologians' said it themselves! Again, welcome to the party, Mr. Dawkins...

p 251, "The editor of _Biblical Creation_ has written: 'it is undeniable that the credibility of our religious and scientific position has been greatly strengthened by the recent lapse of neo-Darwinian morale. And this is something we must exploit to the full.'"

I'm assuming, of course, that Mr. Dawkins quoted this fellow in context. Meanwhile, the _London Times_ has written: "Brilliant exposition, tightly argued but kept readable by plentiful recourse to analogies and examples.... _The Blind Watchmaker_ shows what a convincing scientific argument looks like; it is popular science at its best. An **invigorating** minor theme is provided by the sidesweeps that Dawkins hands out to **creationists**, erring colleagues, misguided interlopers from other sciences, and the media that gleefully misreport their **muddleheaded** musings. Highly recommended." [italics mine]

Hey, this is about TBW itself! In fact, it's part of the review blurbs on TBW's own front pages! Let's see... _London Times_ vs. _Biblical Creation_. Which has more impact in England and the world, I wonder? I'll leave it to the reader to judge whether the _Times_ review effectively reports the quality of TBW...

p 251, "Eldredge and Gould have both been doughty champions in the fight against redneck creationism."

Aaiee! Straw men! Quick, call out some doughty champions! Let the purifying flame _CLEANSE_ this area!

p 251, "What needs to be said now, loud and clear, is the truth..."

Now, _why_ does it _need_ to be said? That sounds like some kind of ethical responsibility towards Our Fellow Man concerning truth. Is that the same ethical responsibility which follows as a result of real human rights and human dignity? You know, those unquestioned speciesist assumptions from back on page 114, which were lumped together with the unquestioned racist assumptions which Mr. Dawkins wanted us to ignore? Or is this the same ethical responsibility for our brother which Mr. Dawkins describes back on pages 206-207 as being a nonrational, nonmoral purely physical side-effect of genetic preference, with 'brother' or 'kinship' being a "statistical label"? ("Remember, by the way, that there is no suggestion here that genes 'want' to help copies of themselves. It is just that any gene that happens to have the _effect_ [his italics] of helping copies of itself will tend, willy nilly, to become more numerous in the population." p 207. Okay, Mr. Dawkins, us rednecks will shorely remember you said 'dat.) Or perhaps this is the same ethical responsibility that those driver ants had, back on pages 108-109? ("Those gaping soldiers were prepared to die for the queen, **not** because they loved their mother, **not** because they had been drilled in the ideals of patriotism, but **simply** because their brains and their jaws were built by genes stamped from the master die carried in the queen herself. They behaved like brave soldiers **because** they had inherited the genes of a long line of ancestral queens whose lives, and whose genes, had been saved by soldiers as brave as themselves." [italics mine])

Why, exactly, on naturalistic grounds, _SHOULD_ the truth be told? Because Mr. Dawkins certainly make it sound as though we were capable of contributing something to the mix here that is _not_ already being taken care of by the blind, nonpurposive, automatic, nonrational, nonmoral laws of evolutionary behavior (much less the overarching-yet-similar-in-quality laws of the universe.) Heck, for that matter, I have to wonder why he's bothering to castigate the applecarting journalists! _THEY'RE JUST DOING WHAT NATURE SET THEM UP TO DO!_

Or, aren't they?

Is the clue-phone ringing yet?

p 251, "[T]he theory of punctuated equilibrium lies firmly within the neo-Darwinian synthesis."

I'll give him that, but with some reservations; I wasn't impressed with how he handled the selective breeding analogy.

p 251, "It always did. It will take time to undo the damage wrought by the overblown rhetoric, but it will be undone. The theory of punctuated equilibrium will come to be seen in proportion, as an interesting but minor wrinkle on the surface of neo-Darwinian theory."

Sorry to pause, but I thought you'd find this funny: while I was reading this, I suddenly realized that "The Battle-Hymn of the Republic" was playing in the background of my mind! Sue me; it's been a long night here in the backwoods.

p 251, "It certainly provides no basis for any 'lapse in neo-Darwinian morale', and no basis whatever for Gould to claim that the synthetic theory (another name for neo-Darwinism) 'is effectively dead'."

Hey, look: an actual quote from Gould! Let's marvel at it for a while... (or was that the ants?) Kind of brief, but I'm sure Mr. Dawkins managed to cogently summarize it fairly for us. Eh?

p 252, "But, to be fair, Gould's remark was aimed not so much at the alleged 'gradualism' of the Darwinian synthesis as at another of its claims."

Ah, good. Fairness is good. This, by the way, leads us into the next chapter!

Meanwhile, I thought this ninth chapter had some merit, and contained (what seems to be) a needed terminological correction which theistic opponents of evolution and/or evolutionism need to fairly accept and apply in the future. But it's highly ironic that this correction contains, at its core, a charge that the key rabblerousers in favor of punctuationism make their case by terminological switching; just like Mr. Dawkins did against miracles in Chapter 6. Onions are not cans of Mountain Dew. Also, I find it suspicious that after all his talk about the fossil record in this chapter, he doesn't actually give us much

particular information about it, much less draw any
conclusions from that particular information. He seems to
be dancing _around_ the fossil record for some reason. But
maybe he'll get to it in the next chapter.

<u>"Watch out for that treeee...";</u>
<u>aka, Chapter 10: The one true tree of life</u>

p 255, "This book is mainly about evolution as the solution of the complex 'design' problem; evolution as the true explanation for the phenomena that Paley thought proved the existence of a divine watchmaker."

I just wanted to point out that, for a change, Mr. Dawkins has decided to use the word 'design' in quotes to indicate that it's not really design. (You might recall that in earlier chapters I've groused that he should consistently keep his use of design-terminology straight so as to leave less room for misinterpretation.)
 This chapter will be about taxonomy, or systems of classification, and how they relate to the question of evolution. Given the relatively 'techy' topic for this chapter, I'm hoping I'll be able to sail through it in fairly short order, maybe picking up some useful information about the theory and practice of the science of classification along the way. But since Mr. Dawkins states that "It is, for reasons I do not fully understand, one of the most acrimoniously controversial fields in all of biology" [p 255], then we might see some fireworks after all. Besides, he always seems to surprise me with unexpected forays into philosophical territory; so maybe I shouldn't get my hopes up.
 p 255, "And from within the ranks of taxonomists have come some of the most outspoken of those modern biologists who pretend to be anti-Darwinian."
 Which gives us, in a nutshell, Mr. Dawkins' reasons for including this chapter, I suppose. I hope he treats these fellows a bit more fairly than he appears to have treated some of his other vocally 'anti-Darwinian' compatriots in the last chapter.

Mr. Dawkins begins by pointing out that all sorts of things can be classified, and that such classification is useful for practical necessity (at the least.) He introduces the example of librarianship as an exercise in applied taxonomy: librarians arrange books according to some sort of order for efficient access, and then help maintain that order. Mr. Dawkins notes that this sort of process is very useful for biologists as well.

p 256, "But to say that this is the only reason for animal and plant taxonomy would be to miss most of the point. For

evolutionary biologists there is something very special
about the classification of living organisms, something
that is not true of any other kind of taxonomy. It follows
from the idea of evolution that there is one uniquely
correct branching family tree of all living things, and we
can base our taxonomy upon it."

Mr. Dawkins will explain in a moment what he means, though
it's almost self-evident (his example, I think, is very
good). And he notes that in addition to this uniqueness
evolutionary taxonomy has "the singular property that I
shall call _perfect nesting_." [p 256, italics his] Let me
take a moment to point out, though, that such
classification of living organisms would not necessarily be
a defeater of creationism (provided the creationism
includes some sort of developmental process.) That is, this
property of taxonomy has consequences for biological
science, but not necessarily for philosophy. Furthermore,
though such a taxonomy may indeed follow consequentially
from the truth of biological evolutionary theory, its own
validity _depends upon_ the truth of the theory. Mr.
Dawkins will have to be careful not to speak as though the
unique taxonomy (whatever it actually turns out to be) of
the sum-total of earth's species is something which _adds
to_ the argument _for_ biological evolutionary theory (much
less philosophical evolutionism.) _Given_ biological
evolutionary theory's validity, scientists may attempt to
discover the actual developmental tree between ancestor and
descendant lifeforms, and may debate about the validity of
the answers with the secure knowledge that (again, _given_
biological evolutionary theory) there must be a right
answer. If the biological theory has yet to be firmly
established (and I've been less than impressed with Mr.
Dawkins' attempt at this, even aside from the philosophical
considerations) then though it might still be proper to
discuss taxonomy, it would be improper to discuss it as if
all that remained was to discover the actual 'tree'.

Let me illustrate my point using a debate from my own
field. Inerrency theory continues to be a hot topic among
us Christians. Some degree of inerrency in Scripture is a
necessary component of the joint mix of philosophical and
historical claims which comprise Christianity. But we
continue to debate about the degree itself (and, as far as
I'm concerned at least, to what degree we should even
continue calling it 'inerrency'). It's a terribly important
topic for a Christian--not least because the answer to the

question will form one of the beacheads for sceptical
criticism. But the sceptic will probably point out that if
we haven't yet established the existence of God, then the
debate about inerrency is moot! It may still be interesting
for a sceptic to watch us debate it, and even to lob in a
few problems for us to chew on, but someone who is
sceptical about God's existence at a basic level probably
won't care what answers we come up with; and I could hardly
blame her for that.

Thus, before we dive into the topic of taxonomy, I'm
calling for a bit of caution on the part of the reader.
Given Mr. Dawkins' previous polemic, I won't be surprised
if he engages in some of that 'acrimonious controversy'
among taxonomic theorists. But if he hasn't firmly
established biological evolutionary theory as a going
concern quite yet, then the contribution to his overall
argument of whatever conclusions he reaches (or positions
he defends) in this chapter will be rather limited.

Mr. Dawkins now explains (pp 256-257) how the
classification of books in libraries or bookshops has no
necessary "single, unique, correct solution". The
bibliophile can arrange the books however she pleases, or
even not arrange them at all. Any order she gives them
helps her (and others) to find them again in the stacks,
but there are plenty of different ordering schemes. Each
has certain advantages and disadvantages. I myself would
say that any given ordering scheme works best for one
particular type of search motif; but then again there is no
absolute single best good-for-all search motif, either. The
"choleric, elderly London clubman" in Mr. Dawkins' (very
funny) example on page 257, for instance, probably searched
for books by remembering their size and shape--or perhaps
only intended that the books be _looked at_ (and so their
order should have a pleasing 'look'.) In either case, the
sort of hierarchy he suggested ('Tallest on the left,
shortest on the right!') would in fact work very well for
the particular method he intended to use. _Given_ his
requirements, that sort of taxonomy in fact worked the
best. The problem was that other people didn't share his
requirements!

I suggest, then, that there are in fact 'correct'
arrangements for library books, but that they necessarily
depend on previously given intentions for book searching.
Those intentions are themselves subjective, and are usually

(though not always) of roughly equal efficiency. Therefore, in the sense of deductive necessities contingent upon the characteristics of the books themselves, I would agree there is no final objective human-independent 'correct' classification scheme for books (barring some kind of revelation from God, of course, which I don't expect to be forthcoming!)

However, if evolutionary biology is true, there is, in fact, an objective potentially discoverable train of development between species. Essentially it's a cause/effect chain. I like to think of it like this: imagine a football field chocked full of mousetraps. Cameras are set up around the perimeter, and one golfball is tossed into the middle. A chain reaction is set up. After the mousetrap eruption dies away, the tape could be rewound and (in theory) each moustrap could be numbered in a branching sequence. For instance, we might discover that mousetrap 7243 was set off by a jostle from mousetrap 4123 and in turn set off mousetraps 712, 2598 and 47. We could then draw something like a map, from left to right, showing the effect of each moustrap on other mousetraps, and so on in turn, throughout the chain reaction. When we were through, we'd have a drawing that would look like a branching tree. And there would be only one 'correct' answer, though due to measuring problems (or even human interpretation in the midst of blurred action) we might not necessarily get the correct answer. The tapes could be watched over and over, and the proposed sequence refined and revised. But there's always an assumed correct answer for us to work towards; something which (in principle at least) is discoverable, and if ever fully discovered cannot be further refined.

This type of unique classification is _not_ restricted to evolutionary taxonomy (or, as Mr. Dawkins labels it for convenience, 'cladistic taxonomy'.) It occurs whenever some objective sequence of events has left marks in history. Taking another example from my own field, the history of the development of Christianity (like the history of any other series of events) has elements which precede and follow one another. People may argue about whether, for instance, the Gospel According to Luke was written before the destruction of the Jerusalem Temple (sceptics tend to try for as late a date as possible for these documents, and apologists for as early a date as possible, for reasons I won't go into here); but the debate would be meaningless

unless one event actually followed the other. The document
certainly exists and thus was certainly composed; and the
Temple was certainly destroyed (in 70 A.D. if I recall
correctly). One of these events must follow the other (more
properly, knowledge of the Temple's destruction and the
Roman/Jewish war must either have been accessible to the
original writer/compiler, or not, before completion of the
document), and exactly where in the time sequence each
event falls is important because an event may not
(naturally, at least) influence the behavior of an event
which preceeds it. So, for instance, if the only documents
we have which describe the practices of mystery religions
in terms arguably similar to Christian doctrine are all
dated _after_ the authorship dates of the New Testament
documents, and we have no extant evidence of similar
behaviors prior to (or concurrent with) the authorship of
the documents, then the argument for pagan influence on
Christianity from those particular practices ('syncretism')
lies in ruins--indeed, it suddenly becomes much more likely
that _they_ were influenced by _Christianity_ instead of
vice versa. There is only one objectively correct sequence
of events in the history of the development of the
Christian religion. The goal of the historian (be he
secular or religious) is to discover it, as far as
possible. Similarly, there is only one possibly correct
train of development from animal to animal in the actual
history of our universe. One of the goals of the
paleontologist (be he a philosophical evolutionismist or
not) is to piece together that actual history of
development. It's a wonderful puzzle!

p 258, "In cladistic taxonomy, the ultimate criterion for
grouping organisms together is closeness of cousinship or,
in other words, relative recency of common ancestry. [...]
Closely related animals are animals that share a recent
common ancestor [such as chimpanzees and humans]. More
distantly related animals share an earlier common ancestor.
Very distantly related animals, like people and slugs,
share a very early common ancestor. Organisms can never be
totally _un_related to one another, since it is all but
certain that life as we know it originated only once on
earth." [italics his]

I should point out in passing that even for the most
radically literal fundamentalistic creationist, organisms
still are never totally unrelated to one another, as they
all derive directly from their commonly shared living

source (God). Obviously this doesn't change if we interpret Genesis _less_ literally. The point is that the creationists agree with Mr. Dawkins about this, and lots of us would even agree with the rest of this quoted section (including the parts I excised for brevity.)

Mr. Dawkins describes the tree-like characteristics of the hierarchical pattern on pages 258-259, and adds a further bit of information: the branches practically never re-intersect with one another once split. (Mr. Dawkins allows for extremely rare possible refusions, like the development of the eukaryotic cell mentioned back in Chapter 7, but these are not the rule.) "Birds and mammals are descended from a common ancestor, but they are now separate branches of the evolutionary tree, and they will never come together again: there will never be a hybrid between a bird and a mammal."

Mr. Dawkins next describes how the same idea may be illustrated with the concept of 'perfect nesting'. Given any current 'snapshot' of existent animals, rings may be drawn around groups, and smaller rings around each sub-group, and smaller rings would encircle the sub-sub-groups, and so on. And never would any ring intersect with another ring. Mr. Dawkins describes this in detail (better than I have) on page 259, though this is one time when an illustration would have definitely been handy. If you're having trouble picturing what he means, go find a fairly detailed map of North America and photocopy it for marking-up. Draw a big ring around the whole continent (Canada, the United States, Mexico, the Carribean Islands and the Central American countries.) That ring would itself be inside the ring which encompasses all countries on earth, but no other countries would fit inside the North American ring (for instance, Japan and its geographical rings would never intersect it, except on the planetary scale.) From there, draw separate rings around Canada, the United States (exclude Alaska, Hawaii and the few American territories in the Caribbean for sake of visual clarity), the Carribean Islands, Mexico, and Central America. None of these rings should intersect one another; Mexico shares no common territory with the United States, for instance. Now turn to the ring of the United States. Within that ring, draw one ring around the Pacific Coast States, one around the Atlantic Coast States, and a third around the landlocked states (the ones without a border on the Pacific or Atlantic Oceans.) Again, no ring will intersect. And within

this division are the states themselves and their counties.
And so on. These divisions would be perfectly nested.

Note that the _type_ of division may not work with every
macro-section on the map. You couldn't draw a ring
separating Atlantic and Pacific countries within the
Central American ring, because countries there have borders
on both oceans. But you might be able to come up with a
clear division scheme for them. Similarly, at any given
moment, there are perfectly 'nested' groups and subgroups
of species on the planet. Mr. Dawkins draws the limit at
the species level because, of course, different animals
within the same species may successfully interbreed. Dogs
(at least some of them) may interbreed genetically with
wolves and coyotes. I'm not sure whether coyotes can
interbreed with wolves, though. Cats, though mammals,
cannot interbreed with any of those animals, so they're
outside that particular circle; however dogs and cats would
both share a common circle with the descendants of whatever
single species (however far in the past that might be) they
descended from. The nesting circles represent a slice of
time, or a snapshot, and as Mr. Dawkins says:

p 260, "In the taxonomy of living creatures... [t]here are
no 'miscellaneous' animals [i.e. species that overlap]. As
long as we stay above the level of the species, and as long
as we study only modern animals (or animals in any given
time slice...) there are no awkward intermediates."

It's worth noting that Mr. Dawkins considers the platypus
to definitely be a mammal, even though it appears to be an
intermediate species between mammal and bird (and reptile,
for that matter... platypuses are poisonous.) However, even
if someone were to argue successfully that the platypus
shared characteristics common to several species, I suspect
the principle of 'perfect nesting' would merely result in
its classification as a species unto itself, which seems
plausible to me--it may be improbable, but not impossible,
that virtually all of its immediate 'cousins' have died off
leaving its link with other animals so many generations in
the past that it only shares very large circles with other
nested circles. Of course, this sort of procedure lends
'perfect nesting' an air of unfalsifiability; but that's
only a problem if someone intends to use 'perfect nesting'
to argue backwards to a proposition. The argument would run
thus: if evolutionary theory is true, species would by
deductive necessity be perfectly nested; species can be

shown to be perfectly nested, therefore this is evidence
that evolutionary theory is true. If the definition of
perfect nesting is such that any questionable species
(should one exist) may plausibly be given its own special
circle (and there seems to be no way to prevent this under
Mr. Dawkins' description so far), then perfect nesting has
no false proposition (real or imaginable) and as such is
not evidence for evolutionary theory's validity. As long as
no one tries to use it for that, though, we may usefully
keep the first part: perfect nesting is a deductively
necessary consequence of the implications of biological
evolutionary theory. Therefore, as long as biological
evolutionary theory is in fact true, we may classify these
circles and try to find the links backward in time which
they commonly derive from, with perfect hope that the links
actually existed (whether or not the evidence remains for
us to discover them by.) The question remains: is
biological evolutionary theory in fact true (and if so, to
what extent?)

One aspect of the actual contentions of biological
evolutionary theory should be noted by creationists
opposing it (for whatever reason): evolutionists are not
claiming that their theory predicts or even requires the
sort of "grotesque chimeras" (e.g., a dog with a horse's
hindquarters) which Mr. Dawkins says he gets sent
occasionally as 'proof' against evolutionary theory. This
is as bad as, for instance, a philosopher redefining
'miracle' as a highly improbable natural event and then
arguing that an analysis of relative probabilities among
natural events of that sort leads us to bet against the
supernatural operation of God in creation. (Note: That sort
of argument would only work against theologians who accept
that even if God exists He never interferes in nature,
which is a virtually naturalistic philosophy to begin with.
Essentially the refutation says that if you don't believe
God ever acts in nature, then for all practical purposes
you're worshipping a nonentity anyway and you might as well
be an atheist! Actually, I agree with that position. This
is why atheists are glad to see us marginalizing our
beliefs with a facetious break between 'reason' and
'faith'. Look at it this way: what would be _our_ opinion
of an atheist who said 'Well, I have absolutely zero
evidence for my position, and in fact as far as I can tell
I never had any and I never expect to have any, but that
doesn't jolly well change the fact that I refuse to believe
in God, and refuse even to look responsibly at your

evidence. Oh, and by the way, you're foolishly mistaken about your belief in God.') It's unfair to claim that an opponent says 'A' when he really says 'R' and then argue that a refutation of 'A' refutes 'R' (it's even more unfair when the argument against 'A' doesn't even work on its own grounds!) At any rate, this is the main point of the second full paragraph of p 261, and I'll let Mr. Dawkins put it succinctly:

p 261, "I have been sent creationist pamphlets that attempt to ridicule evolution with drawings of grotesque chimeras, horse hindquarters grafted to a dog's front end, for instance. The authors seem to imagine that evolutionists should expect such intermediate animals to exist. This not only misses the point, it is the precise antithesis of the point. One of the strongest expectations the theory of evolution gives us is that intermediates of this kind should _not_ exist."

This sort of attempted refutation to evolutionary theory reminds me of the 'half-a-lung' position from earlier in TBW. I find it odd, though, that no one has tried something more serious with Mr. Dawkins; either that, or he simply hasn't bothered to represent those people in this book. 'Tis very peculiar, as I know that Oxford (for instance) still hosts a number of prominent theologians and religious philosophers, and has a rich tradition of such as well. Yet I find no arguments from Mr. Dawkins levelled against the type of positions these people would bring up; only against the level of arguments one would expect from us backwoods rednecks. Perhaps we'll finally get to them in Chapter 11.

p 261, "The taxonomy of evolved living things, then, has the unique property of providing perfect agreement in a world of perfect information."

And, of course, in a world of entities that can judge such claims with at least potentially valid, and not merely incidental, accuracy.

p 261, "That is what I meant by saying that words like 'true' and 'false' could be applied to claims in cladistic taxonomy, though not to claims in any librarian's taxonomy."

Keep in mind, though, that there are areas of classification in other studies where words like 'true' and

'false' could be applied. Mr. Dawkins is being a bit
restrictive with the 'uniqueness' of this sort of claim.

For instance, we could easily apply an earlier example of
mine (classification of textual composition by date for
purposes of establishing or ruling out potential prior
influences) to Mr. Dawkins' two qualifications:

p 261, "First, in the real world we don't have perfect
information. [...] [D]isputes may be difficult to settle
because of imperfect information..."

Which is certainly true of, say, New Testament textual
criticism. No one possesses the autographs, or original
written texts; this forces us to speculate as best we can
about the dating of the original documents.

p 261, "Second, a different kind of problem arises if we
have too _many_ fossils." [italics his]

And for some people this has been a (rather overstated)
problem with the existant NT manuscripts; there are
variations, so which ones should we hold to? The actual
problem is much less than most people think: we know where
all the very late additions are; most of the variations
consist (as I noted earlier) of inconsequential grammar and
spelling; and none of the central Christian doctrines are
endangered by the remaining variations. For example,
whether the guard at the cross stated, after Jesus' death,
that truly this man "was the Son of God" or "the son of a
god" or "a son of God", makes no difference to the theology
(though of course the first variation has been used for
minor apologetic purposes.) The key idea is still contained
in all variations: the soldier was impressed in a religious
sense with Jesus' death (and, presumably, the earthquake
and weather which accompanied it.) This idea holds firm
whether we believe the man stated it in a full-blooded
Christian sense (which I would agree is unlikely, though
not impossible), or in a sense closer to how we might
expect a sincere Roman polytheist would perceive the
situation. If our beliefs centered on how this man
perceived the situation, there would be problems; but he's
a minor player (though a very interesting one.)

This is a bit similar (though also a bit different) to Mr.
Dawkins' problem with too many fossils:

pp 261-262, "The neat and clear-cut discreteness of classification is liable to evaporate if we try to include all animals that have ever lived, rather than just modern animals. This is because, however distant from each other two modern animals may be--say they are a bird and a mammal--they did, once upon a time, have a common ancestor. If we are faced with trying to fit that ancestor into our modern classification, we may have problems."

For example, the _Latimeria_ coelacanth mentioned in the last chapter is more closely related to _us_ than to modern fish, though it certainly looks and behaves much like a fish. We have problems when we try to fit this species into modern classifications. As I noted earlier, one solution (as far as I can tell) would be to simply classify it by itself as a species, linked to us and the modern fish very far in the past, but only at that point.

Mr. Dawkins goes on to explain that, in a sense, a poor fossil record helps us out:

p 262, "A complete fossil record would make it very difficult to classify animals into discrete nameable groups. If we had a complete fossil record, we should have to give up discrete names and resort to some sort of mathematical or graphical notation of sliding scales. The human mind far prefers discrete names, so in one sense it is just as well that the fossil record is poor."

I certainly sympathize with this; I even agree with it in principle. However, let me also point out to the reader that _the fossil record is poor._ There are sensible ways to explain this, under evolutionary theory; there are perhaps ways (as Mr. Dawkins has just shown) that it makes one of our jobs easier, under evolutionary theory. The point is that all of these things depend upon _being under_ evolutionary theory _already_. I think this puts a severe limit on how much we can deduce or infer about the potential truth of evolutionary theory itself _from_ the fossil record; and evolutionary theory (both the science and the philosophy) is what Mr. Dawkins is trying to convince us readers to be true. Certainly, I agree that if the fossil record makes some prima facie _problems_ for evolutionary theory, then it behooves the evolutionistic apologist to demonstrate that the problems don't discredit the theory; that the data fits into the theory. But this is not the same as demonstrating the thing actually happened;

it's a parry which keeps the theory from being discounted.
Parries like this _are necessary_; but they do not
constitute primary argumentation for a claim.

And this, I must suppose, is why we didn't start out with
the fossil evidence: the actual extant evidence seems not
to be strong enough to argue primarily in the theory's
favor. The proper argumentative structure should have been
philosophical, then evidential, then estimates of relative
probability for alternatives. The actual argumentative
structure for TBW seems to have been: presume the
philosophy has already been thoroughly dealt with (but
don't state this clearly, because the point of the book is
supposed to be that the philosophical issues _will be_
dealt with); rig the game even further by probabilistic
fuddling; then note (with a sigh of relief) that it doesn't
matter that the extant evidence is poor!

I suppose even Mr. Dawkins sees the potential problems here
for his stated goals. Had he been merely content to list
and explain the characteristics of evolutionary theory, he
could have stopped with the interesting and informative
observation that, thanks to the implications of
evolutionary theory, "Zoologists can argue unresolvably
over whether a particular fossil is, or is not, a bird.
Indeed they often do argue this very question over the
famous fossil _Archaeopteryx_." (p 262)

But he doesn't stop there; he goes on to attempt a point
which has no bearing on establishing the validity of
evolutionary theory itself. Its only function is to try to
direct the reader's attention to a supposedly similar
problem in the opposition's camp. Of course, I did the same
thing above; I tried to illustrate a problem for purposes
of building a common ground of shared application of
principles, in such a manner that the sceptics and
believers might be able to grasp and sympathize with each
other's positions, and perhaps understand each other a bit
better. However, I directed the opposition to a similar
problem within _my_ camp rather than picking on an
oppositional problem. Mr. Dawkins, as we shall see, is
interested here in fostering opposition: 'they have the
same problem, and theirs is foolish (our problem just
happens to be a natural outgrowth of the theory, nothing to
worry about.)' In so doing, he will expose his position yet
again to the brutal problems which reside at its core,
apparently without realizing his own discrepencies. I will

be slicing the next few paragraphs fairly thin, so pay
close attention.

p 262, "It isn't just zoological classification that is
saved from awkward ambiguity only by the convenient fact
that most intermediates are now extinct. The same is true
of human ethics and law. Our legal and moral systems are
deeply species-bound."

You may recall my remarks concerning p 114; now we will see
them played out further by Mr. Dawkins himself. Our
assumptions of human righs, human dignity, and the
sacredness of human life are _speciesist_ assumptions,
according to Mr. Dawkins. We make them only because we
happen to be humans ourselves. I have already heavily
criticised Mr. Dawkins' own inconsistencies concerning this
stance; and in my original comments about p 114, I
suggested that the real reason he applies to some general
ethical stances (e.g., that people deserve to be told the
truth) and reduces others to speciesist assumptions, is
that the beliefs he 'reduces' happen to be very closely
connected with the philosophical considerations of
creationistic theisms, such as Christianity. Was I
speculating in a vacuum? Or did I guess correctly?

p 263, "Such is the breathtaking speciesism of our
Christian-inspired attitudes..."

Ah-haaaah!! But wait; what _is_ the stated difference
between humanity and other creatures according to Judeo-
Christianity? The merely physical fact that we are human?
No: it is the proposition that we can reason and love,
which is something God can do. Jews and Christians (and, I
presume, Muslims as well, though there are some problems
with predestination here) believe that humans are
sentient like God; made by Him in His image, as the
Scripture puts it. A human is capable of deserving
something because he or she can think, and can act, and
thus can be responsible for actions. Let us see how this
plays out in Mr. Dawkins' first example:

p 262, "The director of a zoo is legally entitled to 'put
down' a chimpanzee that is surplus to requirements, while
any suggestion that he might 'put down' a redundant keeper
or ticket-seller would be greeted with howls of incredulous
outrage. The chimpanzee is the property of the zoo. Humans
are nowadays not supposed to be anybody's property, yet the

rationale for discriminating against chimpanzees in this
way is seldom spelled out, and I doubt if there is a
defensible rationale at all. Such is the breathtaking
speciesism of our Christian-inspired attitudes, the
abortion of a single human zygote (most of them are
destined to be spontaneously aborted anyway) can arouse
more moral solicitude and righteous indignation than any
number of intelligent adult chimpanzees!"

Now the first thing to note is that Mr. Dawkins rather
conveniently ignores the fact that Christians have been on
the front-lines against mistreatment and even vivisection
of animals (as well as defending vivisection); and he
ignores the fact that vivisection (or other animal
liquidation schemes convenient to us) has also been
defended by philosophical naturalists on the grounds that
the animals have no selves to 'suffer'. According to this
view, what we see and hear in the animal's response is only
the biophysical behavior we would expect evolutionary
process to engender in individuals of that species, such
that noisy violent reactions of an individual in distress
alert other species members (perhaps even members of
other species) that assistance is required or danger
should be fled. There is no consciousness in the creature
to actually 'feel' the pain and thus 'suffer' by it. The
people who advocate vivisection (for instance) either claim
that there is no 'self' in the creature to suffer, what we
see being a behavioristic illusion which only looks like
selfhood; or perhaps that though the creatures may suffer,
it is more important in the long run for all creation that
humans benefit from this suffering. I am leaving out of the
account the position that, yes, animals suffer but there's
no point in caring, because we're humans. There may be
people who hold this view, but I don't want to paint
philosophical naturalists as holding it; and I know of no
Christian writer or thinker who holds this view--indeed,
the concept that we should simply ignore the suffering of
others (and the suffering, you'll note, _is_ considered to
be real for this monstrous view) without care for them is
pretty much antithetical to Christian views, partly because
(despite what Mr. Dawkins seems to imply here and shortly
hereafter), Christians and other creationistic theists _do_
see all living creatures as being closely related, at least
through God.

It is not "Christian-inspired" _speciesism_ behind the
'howls of outrage' which would ensue, should a zoologist

suggest liquidating an extra member of the zoo staff; it is a belief in the man's rationality, which entails consequently an ability to suffer and a complaint that these are not good grounds to justify his suffering. There is also, I admit, something of the general 'sanctity' assumed to be part and parcel of human existence, but do the Christians believe this sanctity to be a function of the man's shape, size, and genetic composition? No: it is because the man can think, like God; it is a godlike gift God gave him. It may be that there are times when the man's actions or conditions give us grounds for ending his life; but never arbitrarily, and some grounds would never be considered justifiable to a Christian. Such decisions, if they are to be made, are supposed to be made with weighty care and deliberation, and (for a Christian) with prayer. Human life is not cheap to a Christian; we think it cost the life of God Himself to redeem it from something only a human can do: sin. (This is another point Mr. Dawkins neglects to bring up; Christians also think that our status as humans is not just one of preeminance, but also a disgrace that no nonsentient animal could be guilty of.)

What then is the argument against vivisection and liquidation? That suffering should not take place unnecessarily (a precept taken from the same general _human_ ethic pool as human dignity and human rights), and that the beast suffers; a proposition which includes some weighty philosophical considerations, still under debate, and which otherwise hinges on observations which might as easily be mistaken. Indeed, if philosophical naturalism is true, the observations _must be_ mistaken, on several levels; not least of which is that the conclusion of the concluder himself can only be unintentionally true. Aside from this key problem, the animal itself is a blind, automatic biological machine, which makes no choices and has no consciousness. Without consciousness there is nothing to actually suffer from the biophysical reactions taking place in the creature, whatever it may look and sound like to us. Our impression would thus be merely a projection of our own sympathetic imagination; we imagine what _we_ would feel like under such conditions, or what _we_ would probably be feeling if _we_ were making those noises and movements.

It is extremely telling that Mr. Dawkins, naturalist 'par excellance', who has defended the view of animals as automatic, nonsentient, nonconscious biological machines

throughout his book is nevertheless driven--in order to
make his point here--to describe the chimp as... what?
INTELLIGENT!! Now, how are we supposed to reconcile
this with respect to the rest of his book? At what points
are we supposed to be taking him seriously? Or are we
expected to wave this off with another appeal to the 6=16
proposition: animal behaviour counts as intelligence when
it's time to lambaste the vivisection industry (or justify
anything else in Mr. Dawkins' book, including his own
argument and ethical positions), but it counts as
automatic, blind, nonpurposive biological reactions and
counterreactions when it's time to put evolutionism against
some sort of creationistic theism.

I put the question again, as I've put it before: on what
consistently naturalistic grounds does Mr. Dawkins expect
us to care about the chimpanzee's fate? Is there any ground
he can provide which doesn't contradict other necessary
elements to his philosophy (and/or the necessary
implications of those elements?) What part of naturalistic
philosophy, or what grounds consistent with naturalistic
philosophy, does he hew to when it comes time to deprecate
the second option of his "chastening fantasy" where, if we
didn't recognize full human rights across the spectrum for
all intermediates (should they be discovered), we instead
institute an "elaborate apartheid-like system of
discriminatory laws, with courts deciding whether
particular individuals were legally 'chimps' or legally
'humans'; and people would fret about their daughter's
desire to marry one of 'them'. [He means the intermediates
between chimp and man]" (p 263)

If the reader watches all five of the _Planet of the Apes_
movie series, she will see this point illustrated
concisely: the apes consider themselves to have rights, and
humans none, because they don't realize the humans can
think (and in fact, in the first and second movie, humans
appear incapable of thinking, except for the astronauts).
The apes, in the fourth film, are considered to have no
rights because they are supposedly unable think; and indeed
the villains are desperate to squelch any evidence to the
contrary, because they know the implications of that
information.

Human rights, human dignity and the sacredness of human
life are not conclusions grounded on our mere common
humanity as such; nor are they raw assumptions contingent

on our being human. The rights, sacredness and dignity are
only considered to be 'human' in an exclusive sense insofar
as humans are deemed exclusively intelligent. We have
enacted laws restricting the use of tuna nets, not because
porpoises may become extinct from being accidentally caught
in them along with the tuna (porpoises are far too
thoroughly spread through the oceans of the world for this
to be a danger), but because we are discovering evidence to
the effect that porpoises can think. They thus have the
right not to be caught; they don't _deserve_ to be
caught. We don't care similarly about the tuna, because we
don't think the tuna can think.

And of course, let me remind you that although Mr. Dawkins
wants to inveigle human dignity, etc., as a speciesist
assumption, he has no problem whatsoever calling upon a
presumably real human _responsibility_, such as (drumroll
please) in the case against liquidation itself! For surely,
unless he presumed humans to be capable of real
responsibility, he wouldn't bother decrying liquidation.
But what naturalistic grounds does he wish to give to
illustrate that human sacredness and dignity is a
speciesest assumption ('merely' is implied by his use of
the terms, and also by the vast bulk of his naturalistic
description of the development of behavior); yet human
responsibility is _not_ merely a reflection of our
perceptions of ourselves as the creatures we are (humans)?
He gives no grounds, of course; he is dead silent on that
score. He assumes the answer to one question must be 'no',
without argument to that effect (other than the general
argument presented throughout TBW which, if accepted, would
entail the destruction of the validity of TBW itself); he
assumes the answer to the other must be 'yes', without
argument to that effect. Christianity, meanwhile, accounts
for and explains the glory _and_ the responsibility in
self-consistent, though admittedly complex, terms. (Pascal
has some interesting things to say along those lines,
though I don't recommend all his argumentation). Now, which
belief system looks like the work of naive backwoods
rednecks?

Having hung himself on his own position (again), Mr.
Dawkins returns to the discussion of how various
evolutionists (as discussed in the last chapter) would
perceive the long-term 'shape' of the species-development
tree. Obviously, the gradualists see the differences

between species becoming more and more blurred the more
time (and thus the more intervening species) we consider.

p 263, "The more our view of evolution approaches the
extreme of smooth, continuous change, the more pessimistic
shall we be about the very possibility of applying such
words as bird or non-bird, human or non-human, to all
animals that ever lived."

Let me point out, though, that this increasing pessimism
concerning meaningful classification (used to a certain
extent by Mr. Dawkins in his recent rant concerning
Christian-inspired 'speciesism') has its limits. The
distinction between bird and non-bird may not be clear
among _all_ animals that have ever lived, but it is
certainly clear among _quite a few_ of the animals that
have ever lived. No one suggests that ancient trilobytes,
hammerhead sharks or humans (for that matter) are
questionably classifiable in this regard. There are really
only a relatively few species which are presumed to be
close enough to humanity to warrant close identification
with us. After we go back a certain distance in time (per
evolutionary theories, anyway) it is no longer a question
how closely certain prior species resemble what we are
today, but how closely certain even-more-prior species
resemble our _ancestors_. Exactly where the distinction
should be placed may be up for constant debate; it may
never even be satisfactorily resolved. But there are
distinctions. Remember that, according to his own
testimony, Mr. Dawkins is _not_ a cariacture-style
gradualist, who is the only sort of evolutionist who might
accept a purely smooth 'species-curve'. On the other side
of the spectrum we have the saltationists; they would
perceive the area under the species curve (to borrow the
calculus analogy) as being a relatively small number of
blocky, thick rectangles. Or, as Mr. Dawkins puts it:

p 264, "An extreme saltationist could believe that there
really was a first human, whose mutant brain was twice the
size of his father's brain and that of his chimp-like
brother."

How about the punctuationists?

p 264, "The naming problem would arise even for
punctuationists if literally every animal that had ever
lived was preserved as a fossil, because the

punctuationists are really gradualists when we come right
down to detail. But, since they assume that we are
particularly unlikely to find fossils documenting short
periods of rapid transition, while being particularly
likely to find fossils documenting the long periods of
stasis, the 'naming problem' will be less severe on a
punctuationist view than on a nonpunctuationist view of
evolution."

Yet it seems to me that the current situation leaves real
gradualists in about the same boat; after all, Mr. Dawkins
himself attests (not even two pages earlier in this
chapter!) that the fossil record we actually have is
"poor". (p 262) How is the punctuationists' naming problem
really less severe, than for their slightly more orthodox
gradualist brethren? Mr. Dawkins has just attested that, if
we _had_ a perfect record (which we don't), they'd have
the same problem as the gradualists, since they do
believe in small changes per species evolution (just less
time between small changes, and in relatively brief spurts
before the species reaches a stasis population level). If
the conditions for fossilization were less problematic than
they are (but still problematic enough to prevent a full
record), then the punctuationists wouldn't expect to find
the blurs (they happened too quickly and not often enough),
while I suppose a gradualist would find the blurs more
easily. However, in that case, we'd have a pretty solid
evidential record _against_ punctuationism, so the question
would be moot. But we don't even have that pretty-good-if-
imperfect record. We have a "poor" one. It's one of the
reasons the punctuationists were able to get going in the
first place, according to Mr. Dawkins (and apparently one
of the reasons why Mr. Dawkins has yet to apply to the
fossil record as primary evidence even for gradualist
evolutionary theory! Instead, the fossil record must be
explained from within evolutionary theory's assumed-on-
other-grounds validity.)

p 264, "It is for this reason that the punctuationists...
make a big point of treating 'the species' as a real
'entity'. To a non-punctuationist, 'the species' is
definable only because the awkward intermediates are dead."

This, of course, sets aside any other important
distinctions like that between an automatic, nonpurposive
bat, and a creature (like Mr. Dawkins) who can act
independently enough of nature to create something

"artificial" (remember his description of his biomorphs
back in chapter 3.) By the way, don't mistake my "cloud of
frogs" imagery from Chapter 3 as indicative of
punctuationist leanings; I was discussing what might be
considered the sort of cross-sectional view of a species we
find described in this chapter as being 'perfectly nested'.
Within that context, a species _is_ quite distinct, as even
Mr. Dawkins admits; and I was comparing a property of the
species in that context with the properties of real
(inorganic) 'clouds', for purposes of discussing single-
step and cumulative-step events.

Mr. Dawkins paints a picture of the punctuationsts
(assuming we can trust him on this) as treating species as
discreet entities, because (on their view) the species have
relatively discreet 'beginnings' and 'endings': a species
comes onto the historical scene very quickly, stays around
a while, and then either becomes extinct from environmental
factors including possibly competition from the next wave
of species (as even the gradualists admit happen), or
rapidly cease to exist as _that_ species by turning into a
distinctly different species fairly quickly (which starts
the story of that particular species in a distinct, sharply
defined fashion--at least on the geological timescale.) The
resultant difference in viewpoint is colorfully (and, I
think, usefully) summarized by Mr. Dawkins in the following
paragraph from pp 264-265:

"In a punctuationist book on the history of a group of
animals, say the history of the horses over the past 30
million years, the characters in the drama may all be
species rather than individual organisms, because the
punctuationist author thinks of species as real 'things',
with their own discrete identity. Species will suddenly
arrive on the scene, and as suddenly they will disappear,
replaced by successor species. It will be a history of
successions, as one species gives way to another. But if an
anti-punctuationist writes the same history, he will use
species names only as a vague convenience. When he looks
longitudinally through time, he ceases to see species as
discrete entities. The real actors in his drama will be
individual organisms in shifting populations. In his book
it will be individual animals that give way to descendant
individual animals, not species that give way to species.
It is not surprising, then, that punctuationists tend to
believe in a kind of natural selection at the species
level, which they regard as analogous to Darwinian

selection at the ordinary individual level. Non-punctuationists, on the other hand, are likely to see natural selection as working at no higher level than the individual organism. The idea of 'species selection' has less appeal for them, because they do not think of species as entities with a discrete existence through geological time."

This allows Mr. Dawkins to bring up the hypothesis of species selection, which he had left over from the last chapter. I found this section to be particularly interesting and informative, and fairly well-put, although with one or two of his usual questionable usages of terms. For example, he writes that:

p 265, "Nonrandom recruitment to the species pool and nonrandom removal of species from it could, it is true, theoretically constitute a kind of higher-level natural selection."

I'm not sure what he means, anymore, by 'nonrandom'. To me, nonrandom could mean purposeful, and so if we're talking about, say, the breeding of cattle over the last several thousand years, then the sentence makes sense. Processes similar to what would otherwise take place naturally (blindly, automatically) over geological periods of time are brought into effect by humans, on purpose, for particular ends, in an extremely quick period of time (relatively speaking). We have succeeded in removing certain species of cattle, and succeeded in breeding certain species (or at least in breeding a wide variety of particular traits within the general 'cattle' species. I don't know how effectively cattle breeds can interbreed with one another, the inability of which is a sign of real species differentiation.) Depending on how loosely we define 'natural selection', this could easily count as "a kind of higher-level natural selection"; and because it is certainly purposive (we intended to do it and acted along those lines), it is certainly nonrandom. But I don't think this is what he means by nonrandom here, because he doesn't discuss this sort of thing in the next few paragraphs.

Earlier in the book, of course, he attempted to distinguish between random and nonrandom-yet-non-purposive events. Although I agree these can be valid categories of distinction in some respects, I've already seriously criticised the _way_ that he _uses_ this division. Yet even

on his own terms his use of nonrandom here makes no sense.
The sort of event he considers nonrandom here is explicitly
identified in the same paragraph (p 265) as being "closer
to single-step selection than to cumulative selection." But
the single-step selections were what he considered 'random'
at the beginning of the book, and cumulative step selection
processes provided what he considered the 'nonrandom'
element in evolutionary development. Now he seems to have
reversed the definition. This may only be a result of
unclear composition, though. Perhaps what he means is that
the sort of event which _other_ people would label
'nonrandom' he would, himself, consider more of a random
event (implied from its closer-to-single-step status), and
so what he's really trying to do is correct the impression.
If so, I think it would help if he spelled it out a bit
more clearly. It's been a while since the very beginning of
the book; and his distinction between random and nonrandom
at _that_ point was hardly a model for clarity! It would be
easy for a reader unfamiliar with his term usages to miss
the point that he really doesn't think this sort of process
is 'nonrandom' (assuming that was his actual point here;
hopefully it was not Mr. Dawkins himself who forgot the
characteristics of his own single-step-event defintions!)

I'm going to take a moment to break the topical order, to
share with you something which just happened. Less than 24
hours after I wrote the material a page or two ago,
concerning Mr. Dawkins' inconsistent attitudes toward
"speciesist assumptions", I ran over my cat with my car,
killing her.

She shared my life, and the life of my immediate family,
for about 15 years. That's roughly half my own life, at the
time I write this. It's possible that I was driving my
'own' vehicle before we adopted her as a kitten, but I
doubt it. Since then I've gone through at least four cars,
not counting the one which killed her (a little more than a
year after I bought it.) She successfully defended her
territory against all comers to an age roughly equivalent
to 105 in human years, including one drastic switch in
territory about 8 years ago when we moved. This is depsite
the fact that she was never a very large cat; she just
fought smart and picked her time to press the attack well.
She killed at least two snakes I know of, and treed another
one (which I ignorantly stepped over while going into the
house to get her some water. Once I was inside it suddenly
occured to me she had gazed constantly at one corner of the

steps without once acknowledging my presence. It was a harmless garter snake, but she didn't know that.) West Tennessee winters and summers can be suprisingly brutal, and I was convinced for the last four years at least that she would never make it through another; but she died on a brilliant day in late August which seemed more like early autumn. She died quickly of a broken back, and I spent her last few minutes trying to comfort her. Then I spent two hours digging into the densely packed clay near one of her favorite sunning spots, and returned her body to the earth.

I loved my cat. I am not convinced that every animal, even in a single species, gains consciousness, though I certainly believe there are many species close enough to the edge to warrant some strong suspicion in the case of individuals. But I am certainly willing to believe she was conscious enough to love me in return; and strangely, the last week or two before her death, she insisted that I show her affection any time she knew I was around (she was never an overtly 'affectionate' cat, though she had her moments. Indeed, she never liked to be 'played with' for long, and would sink her claws into you if you persisted.) She was also becoming deaf, however; and that may have been her ultimate undoing (she may not have heard me leave the house and start the car.) But I loved her, and so did my family.

Now, there are several ways to explain what appears to me to have been my act of choosing to 'love' this cat. Perhaps I was projecting unfulfilled amorous or parental impulses onto a 'safe' and handy object; indeed, some behaviorists would say that both impulses are really the same impulse at bottom. Perhaps I was responding to a need ingrained in our species for animal companionship which complemented our own habits (cats eat animals which eat our stored food, and have a certain amount of nighttime warning potential when our eyesight is poorest.) That sort of need would have some survival value, and would contribute to our succesful replication (at least in past generations). But which system of thought allows, without self-contradiction, the impression I have (of acting to encourage my own emotional response) to be what it claims to be--the objectively real 'love' for an object which in some sense could really 'deserve' to be loved (and thus be a proper object for the action); and not be only a subjective emotional froth arising out of biochemistry with regard to an object which could no more 'deserve' to be loved than a black hole or a

cancer? Almost any system of thought might account for
this--_EXCEPT_ philosophical naturalism!

Some pantheisms, indeed, would regard my love and the
object of my love (and even my own 'self') as an illusion,
or perhaps regard the object of my affection as being
qualitatively equal to a cancer or a housefly insofar as
'deserving' love (all things being God). But I will allow
that there may be some variety of pantheism somewhere which
does not gut the impact of my experience by reducing it to
zero or inflating it to a non-distinctive equality with
'everything'. A cosmic dualism (good God equal to evil
Anti-God) would seem to make the distinction of 'love' in
terms of the object and the emotion arbitrary--such a
'love' would merely be the purview of the 'good' God, who
Himself is considered 'good' only as a means of giving a
label to His intents in contrast with His Equal Other's.
But it would at least allow that I could act in that
fashion (however ultimately arbitrary it may be) without
inherent self-contradiction. And certainly there are a
number of polytheisms which would allow for a real act of
real love toward a potentially deserving object without
explaining the experience 'away' as something other than
what it appears to be. Finally, there are the Big Three:
Judaism, Christianity, Islam. I'm not quite sure what
Islamic scholars would say, but I suspect that here they
would agree with Jews and us Christians: I can really act,
and I can really love, and my cat was an object worthy (in
her own, dependent way under God) of being loved.

But what can philosophical naturalism offer here that will
not be self-contradictory to its own assertions and
implications? That my cat was only an automatic,
nonpurposive, biological machine; and that at best the love
I gave it ('she' only being a 'she' in a categorically
descriptive manner) was naively misdirected and most
probably only a result of pure reactions and
counterreactions within my own body, mistaken by me for
something objective which I was 'doing'. At worst, it would
say that I also fall into the same boat as the cat (and if
it does not say this, then it leaves a big, ugly ditch
between what it claims about the cat and what it claims
about myself.)

Now, this by itself, (no further than I've followed it
here, though perhaps you'll remember some other discussions
I've raised along these lines) does not mean that

philosophical naturalism is necessarily incorrect. It may be that my love for my cat was at best a physically induced emotional illusion. But let us hear no more about "the breathtaking speciesism of our Christian-inspired attitudes"! I did not dig through three feet of clay in the late-August sun and pray for the soul of my cat that I might be with her once again some day (should such a thing be possible--there's some debate about the fate of animals, loved and otherwise, in Christian circles) out of Christian-inspired "speciesism". I did it out of Christian-inspired, and Christian-sanctioned, love for a fellow creation of God with whom, as far as I can tell, I shared my soul. _That_ is the legacy of Christian-inspiration in my life. If Mr. Dawkins has been through a similar experience (perhaps involving an adult chimpanzee or two), then I suggest that whatever validity he claims for that experience is the residuum of whatever leftover dregs of Christian thought (or even pagan thought) he has managed to retain _DESPITE_ philosophical naturalism. I suggest that he is a better man for it; that, "This is his glory. Holding a philosophy which excludes humanity, he yet remains human. At the sight of injustice he throws all his Naturalism to the winds and speaks like a man and like a man of genius. He knows far better than he thinks he knows." (paraphrased from Lewis, _Miracles_, Collier/MacMillan:New York, 1978 p 37.)

I've said about as much as I can bear on this topic without becoming angry; but I suggest the reader stop and reflect for five minutes on the extension of these implications into the realm of our feelings about dead (and even living) _humans_. Are you, the reader, really ready to have your feelings about them explained away as a speciesist assumption, or any of a list of naturalistic reductions? Consistent naturalism costs you something. Count the cost.

Before my digression, we were checking Mr. Dawkins' views about the hypothesis of species selection. Setting aside the problem of what Mr. Dawkins means here by nonrandom (which, as I noted, might not be much of a problem if he were only a bit clearer what he's referencing, with respect to 'single-step' vs. 'cumulative-step' selection), he tells us that the species selection hypothesis concerns the following proposition: to what extent does the current

general characteristics of a species influence the
direction in which the species will develop next?

This appears to be something of a broad-stroke natural
selection theory. As an extreme example of my own, let us
say that humans in general have a genetic makeup which just
happens to have virtually no resistance to a particular
sort of virus (call it the Abbadon virus; that means
something like "Father of Destruction" in Hebrew. Cool,
eh?) Should Abbadon ever come into existence and/or be
discovered and subsequently unleashed into the general
population, the human race would likely go extinct. A
general species trait of humans would have been such that
given this sort of circumstance, natural selection would
cause a given change (in this case a drastic one.) Now let
us say that it just happens that a genetic sequence
resistant to Abbadon occurs in humans who also (as a
piggybacking trait) have extremely thorough skin
pigmentation. Should Abbadon be spread, the human race
would soon (in terms of a mere geological tick) have only
this sort of skin coloring; and any other genetic traits
which tend to piggyback along with this sort of skin
pigmentation would also become widely prevalent. Species
selection seems to almost be one half of evolutionary
theory in action; the natural selection part without the
random mutation.

Mr. Dawkins doesn't deny that things like this happen; but
he (rightly, I think) suggests that it doesn't play a major
role in species development over the long haul.

p 265, "As I said at the beginning of the chapter, what I
mainly want a theory of evolution to do is explain complex,
well-designed mechanisms like hearts, hands, eyes and
echolocation."

Well, we know why he wants that explanation, don't we? He
wants the design without a designer; that the 'design' be
'design' yet not be 'design'. Actually, at the beginning of
the chapter he was a bit more precise: he remembered to put
those quotes around 'design'! To be fair, though, an
evolutionary theory _should_ explain the natural processes
connected with this situation. Evolutionists should also
seek to discover what in fact those processes are. One of
the major criticisms levelled against evolutionists
historically is that they seem to often proceed by forming
a hypothesis about species development with premises

specifically competing with a _philosophical_ position; and
they then try very hard to force the data to conform to the
hypothesis rather than revising the hypothesis as
necessary--in order to retroactively protect the
philosophical committment (which generally stands or falls
on its own grounds). This sort of behavior is certainly not
new in the history of science; and I've caught my 'creation
science' brethren trying the same thing more than once.

p 265, "Nobody, not even the most ardent species
selectionist, thinks that species selection can [account
for design of intraspecies mechanisms]. Some people do
think that species selection can explain certain long-term
trends in the fossil record, such as the rather commonly
observed trend towards larger body size as the ages go by."

For instance, I've heard anthropologists and historians say
that humans appear to be getting larger, on average.
However, that would probably not count as evolutionistic
development; I suspect it's more like the results we get
from breeding cattle: it's a factor dependent on human
social behavior _apart_ from naturalistic evolutionary
procedure. Otherwise, it might blow a hole in the
gradualist position! (Or, then again, maybe not. Moths near
opened coal mines have changed their color to match the
effects of coal dust in the environment. I wonder if this
counts as a selective breeding effect, except by accident
instead of intent? I could imagine a small active volcano
producing the same effect...) Hopefully, Mr. Dawkins will
have something to say on this subject later.

Rather than discuss relatively quick human size increase,
Mr. Dawkins uses the (almost relatively quick, geologically
speaking) example of horses increasing from terrier-size to
Clydesdale-size in 30 million years or so.

p 266, "Species selectionists object to the idea that this
came about through consistent individual advantage: they
don't see the fossil trend as indicating that large
individual horses were consistently more successful than
small individual horses within their species."

Instead, Mr. Dawkins says, the species selectionists
postulate a species pool; a population set with lots of
different species (not just lots of individuals within a
few species). Some species were large, some were small. It
may even have been that _most_ of the species were small.

Nevertheless, certain qualities inherent in the characteristics of the large species ensured that those species avoided extinction more efficiently, and perhaps spun new species off more efficiently. Over time, with this set of species lasting longer and spawning more (probably similar sized) species, the larger species would pull ahead of the smaller ones (so to speak); and this explains why there are no smaller horse species left (the larger horse species happened to survive as 'species' longer.)

Now, Mr. Dawkins believes that the species selectionists may be right about examples like this; though he suggests that such development may be more of a successional trend rather than a properly evolutionary trend. What he denies is that this sort of trend contributes as "an important explanation for the evolution of complex adaptations." (p 266)

When Mr. Dawkins says "complex adaptations", he's not talking about a process, per se (at least not here). He means the actual, particular features of an individual within a species: eyes, hearts, etc.

p 266, "What kind of traits can _species_ be said to have? The answer must be traits that affect the survival and reproduction of the species, in ways that cannot be reduced to the sum of their effects on individual survival and reproduction." [italics his]

The problem, as Mr. Dawkins points out on p 267 is that:

"It is hard to think of reasons why species survivability should be decoupled from the sum of the survivabilities of the individual members of the species."

For instance, as my own example, a species selectionist would say that some property of large horse species made them more immune to extinction and/or better equipped to spawn new species. What would that property, or combination of properties, be? The species selectionist might reply, 'Well, longer legs allow for better visual range, thus allowing for more efficient detection of potential predators.' But what, exactly, are those longer legs helping? The _individual_ horse! This sort of effect _in sum_ affects survival and reproduction of the species; which means that it is not a purely _species_-specific

trait. The effect can be reduced to the success and failure of individuals, as individuals.

Mr. Dawkins suggests that a better example of a species-level trait would be the fact that all koalas live in eucalyptus trees and eat eucalyptus leaves. Unlike 'long-leggedness' (Mr. Dawkins specifically says), such uniformity would be a true species-level trait. To understand the distinction, remember the actual properties of long-leggedness in a single species of horse. Horses don't start off their lives with the exact same leg length across all individuals. Hoses don't even all reach full maturity with the same leg length across all individuals. Within the same generally long-legged horse species, some individuals at some times will have longer legs than others. But all individual koalas eat eucalyptus leaves (minus the babies living on mother's milk, of course, but that's the same as living on eucalyptus by second-hand: if the mother doesn't get _her_ eucalyptus, the baby doesn't get milk.)

So, Mr. Dawkins even agrees that there are examples (or at least arguable examples) of true species-level characteristics. "The trouble," he says on p 267, "is that examples of such species-level traits are few and far between." That by itself puts a massive damper on how much developmental effect we can expect from a species-level trait.

Mr. Dawkins suggests that what he calls an "interesting" theory from American evolutionist Egbert Leigh, may be another "possible candidate example of true species-level selection".

p 267, "Leigh was interested in that perennial problem, the evolution of 'altruistic' behaviour in individuals. He correctly recognized that if individual interests conflict with those of the species, the individual interests--short-term interests--must prevail. Nothing, it seems, can prevent the march of selfish genes. But Leigh made the following interesting suggestion. There must be some groups or species in which, as it happens, what is best for the individual pretty much coincides with what is best for the species. And there must be other species in which the interests of the individual happen to depart especially strongly from the interests of the species. Other things being equal, the second type of species could well be more

likely to go extinct. A form of species selection, then, could favour, not individual self-sacrifice, but those species in which individuals are not _asked_ to sacrifice their own welfare [their welfare and the collective species welfare coinciding]. We could then see apparently unselfish individual behavior evolving, because species selection has favoured those species in which individual self-interest is best served by their own apparent altruism."

Now, I am far from denying that this sort of process can happen. I am even willing to grant that it _has_ and _does_ happen--though I'm having a tough time trying to figure out how such a species, in which the interests of the individual happen to depart especially strongly from the interests of the entire population, could get going long enough to even count as a 'species'. Such a situation seems more likely to be a product of a macroscale environmental change on an already-existant species, like the koala, which already has a species-level characteristic. So, for instance, should Mr. Dawkins' postulated eucalyptus plague wipe out virtually all the eucalyptus within a koala population's effective range, the universal interest of the individual koalas (eat eucalyptus) would be at odds with the interests (if you want to call it that) of the species: find an alternative food-source or go extinct. By Mr. Dawkins' own paradigm, such an example would be 'few and far between', and consequently (again following Mr. Dawkins' lead) I'm not sure why we should expect this sort of process to be an important contributor to "apparently altruistic" behavior, on any score. However, I'm willing to set aside that potential problem; that's for the zoologists to debate. My real question is whether Mr. Dawkins wants to attribute his _own_ "apparently altruistic" behaviors to this process.

If you, the reader, do the logical math here, you will find that it reduces much of Mr. Dawkins' justifications to nonsensical statements. I've already covered this extensively, though; so I'll leave it as an exercise for you to apply this sort of explanation to, say, his stirring soliloquies declaring people _deserve_ to know the truth about evolutionism, and that creationistic theists _should be_ stopped. He certainly speaks _as if_ our behaviors in these matters were not solely and ultimately dependent on our 'selfish genes' (whether or not their operations are conducive to our survival as a species.) Is he being merely "apparently altruistic" when he decries racist assumptions

or the treatment of Australian aboriginies? If the answer
is 'No'--if the answer is that he claims to be altruistic,
not merely apparently altrustic--then I suggest that his
naturalism does not account for a rather important facet of
his _own_ behavior!

Leaving George of the Jungle to dodge _that_ particular
tree again, Mr. Dawkins presents "perhaps the most dramatic
example of a truly species-level trait": sexual vs. asexual
reproduction. Mr. Dawkins admits that the existence of
sexual selection poses "a big theoretical puzzle for
Darwinians". I find myself, at this stage, to be intensely
curious what this big theoretical puzzle is: something so
tough that, according to Mr. Dawkins, even "R.A. Fisher,
usually hostile to any idea of selection at levels higher
than the individual organism, was prepared [many years ago]
to make an exception for the special case of sexuality
itself." p 268. However, Mr. Dawkins spares us the headache
involved in trying to deal with this problem--whatever it
is.

Species selection theory, apparently, helps solve this
(muted) problem, because sexual species (for reasons which,
again, Mr. Dawkins decides not to tell us, though in this
case I'm willing to accept his voucher) are "capable of
evolving faster than asexually reproducing species.
Evolving is something that species do, not something that
individual organisms do: you can't talk of an organism as
evolving." (p 268) Therefore, according to the gamerules
species selection 'works' by, sexually reproductive species
would eventually come to predominate the species pool of
the planet. However, Mr. Dawkins makes it clear that even
in this case, this sort of process would not be capable of
'putting together' the actual machinery of sexuality
(organs, behaviour, cellular processes, etc.) It would only
ensure that such machinery, once it got there (however it
got there) would become predominant in the species pool, as
opposed to the (relatively) less efficient asexual
reproduction methods.

Or, as Mr. Dawkins puts it himself on pp 268-269:

"[Species selection] is not a significant force in the
evolution of the complex machinery of life. The most it can
do is to choose between various alternative complex
machineries, given that those complex machineries have
already been put together by true Darwinian selection."

Or, I should add, given that those complex machineries have already been put toghether by anything else. Having discussed species selection, and outlining what it can and cannot account for, Mr. Dawkins returns to taxonomy and its methods.

Mr. Dawkins refers us briefly to his fourth chapter ("Making tracks through animal space"), where we saw how:

p 269 "...over and over again, animals have been found to resemble unrelated animals in other parts of the world, because they have similar ways of life. New World army ants resemble Old World driver ants. Uncanny resemblances have evolved between the quite unrelated electric fish of Africa and South America; and between true wolves and the marsupial 'wolf' _Thylacinus_ of Tasmania."

Here is the problem, Mr. Dawkins says: back in Chapter 4 he simply asserted that these species were unrelated. How do we _know_ they're unrelated?

p 269 "If taxonomists use resemblances to measure closeness of cousinship, why weren't taxonomists fooled by the uncannily close resemblances that seem to unite these pairs of animals? Or, to twist the question round into a more worrying form, when taxonomists tell us that two animals really _are_ closely related -- say, rabbits and hares -- how do we know that the taxonomists haven't been fooled by massive convergence?" [italics his]

This is a problem because, as Mr. Dawkins noted in Chapter 4, taxonomists do make mistakes: the Argentenian fellow "pronouced litopterns ancestral to true horses, whereas they are now thought to be convergent on true horses." (p 269)

p 269, "Who is to say that future generations of taxonomists won't change their minds yet again? What confidence can we vest in taxonomy, if convergent evolution is such a powerful faker of deceptive resemblances?"

Mr. Dawkins says his optimism about this problem stems from our development of new techniques in molecular biology. As he notes, the genetic makeup of every living thing, from humans down to bacteria, is actually astonishingly similar.

p 270, "The genetic dictionary has 64 DNA words of three
letters each. Every one of these words has a precise
translation into protein language (either a particular
amino acid or a punctuation mark.) The language appears to
be arbitrary in the same sense as a human language is
arbitrary (there is nothing intrinsic in the sound of the
word 'house', for instance, which suggests to the listener
any attribute of a dwelling.)"

This level of arbitrariness, though, flies in the face of
the claims suggested by Mr. Dawkins in Chapter 6, regarding
the development of DNA strands first from regular crystal
patterns in inorganic matter (silicon) and then from the
repitition of accidental errors in the crystal patterns.
This sort of process, carried to an unimaginable extreme
(and factoring out, conveniently, the probable time
required to reach sufficient complexity, which I think
we'll find to be prohibitive) would at best produce
something like a fractal shape; a complex but _repetitive_
pattern which has inherent constraints with regard to its
repetition. This is _not_ what we find in DNA. But I don't
want to lean too hard on this point, since even the 1996
edition of TBW is really only the 1986 or 1987 version with
a new introduction. Perhaps a new theory has been advanced
which attempts to account for this very unusual sort of
complexity via another source. My only point here is that,
as it stands, the link between these two conflicting ideas
needs revision.

p 270, "I regard this as near-conclusive proof that all
organisms are descended from a single common ancestor. The
odds of the same dictionary of arbitrary 'meanings' arising
twice are almost unimaginable."

Although I certainly agree this _could_ be the correct
interpretation, there is nothing in any of the
creationistic theism varieties I'm aware of which
necessarily contradicts this. That is, even if God created
all life on earth in one or two literal days, without any
development within the system He had previously set up on
the previous days (however you wish to define 'day'), He
would not necessarily have used different genetic
'dictionaries' for each, or any, species. Put another way,
there is nothing I know of in any variety of creationistic
theism which prevents God from having used one genetic
dictionary. As far as that goes, then, this evidence only
works as "near-conclusive proof that all organisms are

descended from a single common ancestor" on the presumption
that all organisms are descended from a single common
ancestor! It _has_ a bit of _limited_ use--at least it
suggests that _within_ biological evolutionary theory
(and/or philosophical evolutionism) we share a common
proto-species ancestor. But that's as far as it can be
taken.

Be that as it may, this similar genetic 'language', and the
sorts of proteins it generates, gives us (as Mr. Dawkins
says) the ability to determine with a fairly high degree of
accuracy, how closely 'related' any species is with any
other; a process he describes well on pages 270-271. I
should perhaps point out again that this ability does not
count against even the most anti-evolutionistic of
creationistic theisms: given a one-time recent creation,
there is nothing intrinsically nonsensical about the
concept that species X is far more similar (or 'more
closely related', if you wish to put it in those terms) to
species Y than either is to species Z. And I also want to
point out that the technique of estimating the date of
common ancestry between two species by measuring the
similarity of certain shared proteins (such as those found
in warthogs and humans, per Mr. Dawkins' example), only
works given certain assumptions concurrent with the
assumed validity of evolutionary theory--whether those
assumptions are themselves well-grounded conclusions or
merely restrictive presumptions still remains to be seen.
(Please remember that I am myself someone who has accepted,
and is still willing to accept, biological evolutionary
theory. But I would be shirking my duty if I didn't point
out in passing that this sort of thing would not--and
should not--bother my more radically opposed creationistic
brethren.)

p 271, "The reader may be puzzled, at this point, by an
apparent inconsistency. This whole book emphasizes the
overriding importance of natural selection. How then can we
now emphasize the randomness of evolutionary change at the
molecular level?"

<snort!> If the reader, at this point, has not already
jettisoned TBW's argument for its quite _real_
inconsistencies, a minor 'apparent' inconsistency such as
this shouldn't be much to worry about. And it's a minor one
indeed; random molecular change _and_ natural selection
processes are both very necessary to the best evolutionary

theories (however good they are.) A page and a half of discussion about a useful property of random molecular change is hardly likely to overthrow the emphasis on both processes; so I agree with Mr. Dawkins (not necessarily "to anticipate Chapter 11"), that "there is really no quarrel with respect to the evolution of adaptations, which are the main subject of this book." (p 271) I do, however, quarrel with him concerning this little throwaway remark on the same page:

p 271, "Every sane biologist agrees that these can only have evolved by natural selection."

Presumably, a biologist cannot merely be massively mistaken should she in fact disagree with this estimate; she must be insane. Considering the massive errors I've uncovered in TBW, shall I conclude that Mr. Dawkins is insane (and not merely wrong?) Hmmm....

I'm only being slightly facetious; one of my pet peeves (and philosophers have only themselves to blame, historically, for fostering this attitude) concerns our use of the words 'rational' and 'irrational' with respect to the correctness or incorrectness of a theory. Traditionally, philosophers have often attempted to show that such-and-such a theory is 'irrational', or even that it is 'irrational' to hold such-and-such a theory. This breeds ill-feeling among competitors, because similar charges levelled against their own theories can only be met with a surly 'Hey, he's saying _I_ am irrational!' Frankly, I intend to make a call for a vast restriction of this term set in these sorts of discussions: I would consider the phrase "It is irrational to believe in naturalism", for instance, to be a grammatic contradiction. A person who believes in philosophical naturalism is not being irrational; otherwise he would be incapable of a 'belief' at all. He may be (I think he is) _mistaken_, but that's not the same thing. This is a gripe to be developed in another venue, though.

p 271, "It is just that the neutralists [taxonomists who believe most of the evolutionary change that goes on at the molecular level is _neutral_] think -- rightly, in my opinion -- that such adaptations are the tip of the iceberg: probably most evolutionary change, when seen at the molecular level, is non-functional."

I suspect that this accounts for the 'junk DNA' sequences which show up in our genes; the sections which seem to have no particular use other than to separate genetic 'phrases' in genetic 'sentences'. The existence of the junk DNA sequences, by the way, gives us the opportunity to develop the scientific technique of gene splicing. As Mr. Dawkins points out, it also gives us the opportunity to compare large tracts of genetic text between two apparently similar animals without much fear of the convergence problem.

As far as I can tell, this is how it works: let us say we have three animals, and we take a large representative sample of genetic 'text' from the same 'places' in each animal's gene sequence. We compare these three samples together; for purposes of simplicity we'll pretend that each sample actually gives us an English 'sentence'. Here are the results:

The animal 'A' sequence reads METHINKS IT IS A WEASEL.
The animal 'B' sequence reads METHINKS IT IS A WEAZEL.
The animal 'C' sequence reads ME STINKY SPIT ON EASEL.

Neutralists believe that the majority of genetic code change "has nothing to do with fitting it to its peculiar way of life; text that is largely untouched by selection and largely not subject to convergent evolution except as a result of sheer chance." (p 272) If much of the genetic code _were_ a result of reactions to natural selection processes, then we'd be unable to tell whether animal 'A' and 'B' were related, or whether they just happened to have a similar enough process of development to end up having similar genes. The neutralist, from what I gather here, would claim that most of the letters in A's and B's gene code are _not_ the result of macroenvironmental processes; therefore, the high degree of similarity gives us statistically solid grounds for treating them as close cousins. Animal C, meanwhile, would not be closely related to either A or B, despite some striking (though ultimately shallow) similarities. This would be true, even if all letters in these gene sequences were 'junk' except for the third letter from the end (the S or Z), which per hypothesis would indicate that A and C share normally _observable_ similarities (the 'S' traits) as opposed to animal B which features the rather different Z trait. Nevertheless, it is A and B which are closely related (because of the overall similarity of the _full_ genetic sequence), not A and C.

That being the case, Mr. Dawkins writes truly that:

p 272, "It is hard to exaggerate the extra power that the new molecular sequence-reading techniques have added to the taxonomist's armoury. [...] These [characteristics of histone proteins] are not vague measurements of the kind which, like leg length or skull width, might vary with the age and health of the specimen, or even with the eyesight of the measurer. They are precisely worded alternative versions of the same sentence in the same language, which can be placed side by side and compared with each other as minutely and as exactly as a fastidious Greek scholar might compare two parchments of the same Gospel."

This is, of course, ironic, since he elsewhere (pp 125-126) attempts to imply that Scriptural texts are, by nature of imperfect human transmission (compared with highly efficient molecular transmission) rather corrupt. The same fastidious Greek scholars, whose actions he here compares favorably to gene sequencing taxonomists, tell us that the Scriptures have come down to us with a better than 99% success rate in transmission, dating back almost 2000 years in the case of the Christian canon, and more than 2100 years in the case of the Jewish canon. That's an astounding success rate for ancient documents! Either the fastidious Greek scholars he mentions here are galactically wrong (which has humorous results for our comparison with genetic taxonomists), or he should perhaps give the Scriptures a bit more credit back in chapter 5.

That's only an amusing side-issue, though. What I _really_ want to know is whether this degree of individual-independent genetic similarity (the similarity must be very largely individual-independent, or else it would fotz the statistical conclusion) does or does not count as the sort of species-level trait which Mr. Dawkins contends cannot produce complicated eyes, hearts, etc. If it does not count, then I think some extra description is necessary (perhaps we'll get to it later) (Hindsight note: we don't.). If it does count, then either Mr. Dawkins needs to drastically revamp his description of species-level traits; or (drumroll please) he has just demonstrated that genetic structure _also_ cannot account for the apparent 'design' of complex organisms! (I suspect he'll take one of the other two options.)

[Note to editors: check this last argument especially closely. Did I get it right? Do I need to add something?]

At any rate, now that we have some principles to go by (animals which are _not_ close relatives are extremely unlikely to have very similar genetic sequences at similar genetic points), and now that we have the genetic sequencers to acquire the data for applying the principles, we're ready to rock and roll, right? All we have to do is take, say, 20 animals, and let a computer figure out which mixture of family relationships requires the minimum number of word changes in evolution combined with a minimum chance for accidental convergence. Well, as Mr. Dawkins points out, it's not _quite_ that simple. Those mere 20 animals could be the result of 8,200,794,532,637,891,559,375 different family trees, any of which (as far as we could tell before the sequencing started) might be the correct one--though of course, only one really is the correct one. At the time TBW was first written (1985/86), it would take a computer 10 billion years to ensure we had the best possible tree. Today (1999) we might be able to do it in 10 million years; I suspect by the end of my life (especially given the new breakthroughs in quasi-organic chips which are promised soon) we may be in a position to turn the computers loose and get a practical answer to the probable relationship of those 20 animals. On the other hand, it will probably be sooner than that; computers can be programmed to drastically cut down the number of trees by ignoring, say, any tree which suggests earthworms and humans are close cousins (as Mr. Dawkins notes, p 274.)

Even better, as Mr. Dawkins says:

p 274, "Molecular information is so rich that we can do our taxonomy separately, over and over again, for different proteins. We can then use our conclusions, drawn from the study of one molecule, as a check on our conclusions based on the study of another molecule. If we are worried that the story told by one protein molecule is really confounded by convergence, we can immediately check it by looking at another protein molecule. Convergent evolution is really a special kind of coincidence. The thing about coincidences is that, even if they happen once, they are far less likely to happen twice. And even less likely to happen three times. By taking more and more separate protein molecules, we can all but eliminate coincidence."

All of which is well and good for studying the genetic
relationships between animals. But perhaps you'll remember
that Mr. Dawkins also uses this sort of process to
increase our confidence that the results from a
cumulative selection chain are probable. So, which one of
Mr. Dawkins' uses for multiplication of hypotheses are we
supposed to trust, here?

'Wait!' you may exclaim. 'This is not a cumulative-
selection example! He is discussing a situation where two
species do _not_ have necessary interactions (i.e., they
are _not_ related); that is why he can say that drastic
similarities in three random selections from corresponding
spots in each species' gene structure is much less probable
than the chance of two random selections being similar.
Those selections from (per hypothesis) unrelated species'
genes are by default also unrelated to one another;
therefore this is a single-step selection example. Maybe...
<waving the magic wand of probability calculation> maybe
that's why he can claim this procedure _decreases_ our
estimate of potential probability in this example, and
increases it in terms of incremental development!'

I agree that the selection of random genetic 'sentences'
from corresponding sections of the chromosomes of two
different species is a single-step event. Furthermore,
assuming before the experiment they are unrelated, I
agree that it becomes increasingly improbable that drastic
similarities in these paired samples would continue to be
found. Therefore, I agree that the discovery of even one
set of drastic similarity would be grounds for assigning
high probability to the conclusion "They are actually
related"; and I agree that the more similarities discovered
in this fashion, the greater the chance of relationship
(and the greater the chance of _closer_ relationship) there
would be. What I deny is that _adjusting_ our probability
estimates from the acquisition and comparison of _multiple_
samples is a single-step process.

Here's how that works: we take a sample of the genetic code
from position x of species A, and from position x of
species B. By calculation we have estimated that the
probability of their being unrelated and yet having very
similar codes at any given position (including position x)
is one in a million. Lo and behold, they both have very
similar codes at position x. We may conclude that there is
only a one in a million chance that species A and B are

unrelated; in other words, they're almost certainly
related. We want even greater certainty, so we snip some
genetic material from the y position of both species'
genetic structure. What is the chance that A and B's y-
samples will resemble each other? _Still one in a million_!
That's the probability of _any_ given corresponding section
being drastically similar for species A and B. Lo and
behold, the y-position samples are also similar. What is
the probability now that A and B are unrelated? If we only
consider the x-samples or the y-samples, we would say 'one
in a million'; that would be a single-step estimate of
probability. But the odds that _both_ samples would
concurrently be similar are not one in a million. The odds
are 1:1,000,000,000,000, or one in a trillion. The combined
odds are a product of the two stand-alone estimated odds.
The cumulative-step estimate provides us with greater
certainty that these two events (independent development of
species A, and independent development of species B) cannot
be true. Do they provide us with absolute certainty? No!
But it would be wise to bet against it _given we had no
other counterbalancing reason to suspect A and B were
unrelated!_

This is why I say that Mr. Dawkins' earlier attempt to
increase our confidence of the probability of a cumulative
step event does not necessarily wash. I agree that _if_ we
could somehow validly estimate the chances of life
spontaneously arising in a fully formed state (i.e., a
single-step event) without vague handwaving guesstimates;
and _if_ we could somehow validly estimate the chances of a
cumulative-step process without similar vague handwaving;
and _if_ a comparison of the results showed the cumulative-
step event to be more probable (even if still massively
improbable in and of itsef); AND _if_ we had a solid
evidential base to back up one event and not the other
(because both events are still massively improbable);
then we'd be wise to bet on the cumulative-step event. I
even agree that _if_ the 'probability' of a posited
supernatural event could somehow be validly estimated and
represented within the context of a naturally interlocked
system; and _if_ that estimation happened for whatever
valid reason to be equivalent to a single-step natural
event of similar type; and _if_ a comparison with the
probabilities inherent in the cumulative-step event turned
out to favor the cumulative-step event; and _if_ we had no
good reasons on other grounds to favor the supernatural
event over the cumulative-step natural event and/or we had

good, clear evidence for the cumulative-step event (because
both sets of events are still massively improbable); _then_
I would agree it was wise to bet on the cumulative-step
event. What I deny is... well, pretty much everything after
the ifs!

I contend that we have no cogent means of estimating the
probability of a single-step natural 'poof' into existence.
We can make some guesstimates of probability; but I have
yet to see any guesstimates that didn't lean heavily on
vague handwaving figures. I contend that even if we felt
that we could get a fairly reasonable guesstimate despite
the acknowledged difficulties involved in such an endeavor,
estimating the probability of a cumulative-step event would
require dealing with that sort of difficulty a million-fold
(or however many steps there are supposed to be in the
cumulative-event. One of the chief problems would be
estimating the number of steps.) I contend that the
multiplication of hypotheses necessary to even begin
estimating a cumulative-step event has no inherent tendency
to come up on the probable side of any given single-step
estimate, and that in any case such a procedure can only
become more and more improbable with every step, no matter
how probable any given step may be in and of itself
(assuming we could determine each step's probability with
anything approaching a useful figure.) I therefore strongly
deny that any cumulative estimate of probability has any
tendency to _increase_ our confidence in the chances of the
entire sequence occuring. I contend that attempting such a
radical speculation without first checking the constraints
of the evidence only illustrates irresponsibility. I
contend that attempting such a radical speculation while
knowing all the time that the evidence has to be shoehorned
into the defending theory (rather than positively
supporting the theory), borders on fraudulence. I contend
that by the character of the claim, a supernatural action
is not a grossly improbable natural event (or any other
kind of natural event, though it could well _affect_ nature
as one of its effects). I contend, therefore, that its
probability cannot be gauged as if it were a grossly
improbable natural event. I contend we have good reasons,
philosophically and historically, to accept the existence
and even the character of a supernatural Actor. I was under
the impression that somewhere there was good, clear
evidence that the cumulative-step event had occurred also;
but so far the actual _data_ given by Mr. Dawkins does not
seem to exclude a single-step event (that is, without being

washed first through naturalistic philosophy and anti-
probability estimates, etc., etc. On the other hand, to be
fair, it seems like the actual data _could also_ fit the
cumulative-step event. But 'fitting a cumulative-step
event' doesn't necessarily _exclude_ 'fitting a single-step
event'.)

Taken altogether, then, I suggest that if we're going to
bet, we should bet on some variety of supernatural event
with a supernatural Actor (be the event single-step or
cumulative-step, either one of which seems a tossup at this
point.) Of course, I have the advantage of having seen much
more of the historical argumentation than I've presented to
you, the reader, in SMB. But, scattered here and there, you
have been getting some of the basic philosophical
arguments, so you should already be able to make a fair
estimate of their worth.

On p 274, Mr. Dawkins describes an experiment regarding the
protein-based classification of eleven different animals:
sheep, rhesus monkey, horse, kangaroo, rat, rabbit, dog,
pig, human, cow and chimpanzee. Protein classification
theory says that if we take protein samples from similar
genetic positions on each animal, and run a comparison
between them, we can discover how closely related each
animal is to each other. We should then be able to
progressively weed out the probability of error by
examining similar proteins. That is, the scientist will
study the x-protein (representing x-position on the DNA)
for each of the animals and classify them; then double-
check by studying the y-protein for each animal; then
triple-check by studying the z-protein; and so on. Mr.
Dawkins reports that the experiment was run with five
proteins. There are 654,729,075 theoretically possible
family relationship trees for any set of 11 animals; and
Mr. Dawkins notes that they used "the usual short-cut
methods." Given the way that Mr. Dawkins used short-cut
methods in his biomorph examples back in chapter 3, and
then was astonished to see the biomorphs 'developing' into
certain shapes, I must be a bit suspicious about the sorts
of (unstated) "usual short-cut" methods employed here.
However, since the experiment was (presumably) run without
Mr. Dawkins' input, perhaps some measure of objectivity was
achieved.

At any rate, each of the five tests returned a relationship
tree which was very similar to each other; which is a good

result for this sort of test--assuming the "usual short-cuts" didn't unduly overbalance the potential answers. There was some minor variance, but not enough to raise suspicions of hypothesis invalidity; a perfect agreement between all tests would be highly unlikely, and isn't really necessary. Mr. Dawkins does draw one observation about the results which contains a hidden implication:

p 274, "Theoretically, if evolution were not true for example, it is possible for each of the five proteins to give a completely different tree of 'relationships'."

I agree with this; but remember that one of the opponents to biological evolution--fundamentalistic creationism--would not necessarily _require_ that the five proteins give _different_ answers. This is not an either/or qualifier; it keeps biological evolution in the game, and that's important (as far as it goes), but it doesn't exclude that particular opponent. And obviously it affects the claim of evolutionistic creationists even less. Those theists (including quite a few Christians) believe God exists, has a certain character, acts in human history independently of nature, and has acted within intentionally designed evolutionistic laws to produce species. This would definitely be an interesting result for them; but hardly anything to worry about.

Also remember that the conclusion Mr. Dawkins reaches from this experiment about _ancestors_ (rather than merely similarities) depends on biological evolutionary theory _already_ being true. The conclusion about 'ancestors' (as such) only works as a corollary of biological evolutionary theory, which must be established on other grounds. Otherwise, the protein test only establishes a relationship of similarity.

Let me warn, though, that Mr. Dawkins is correct when he states that "minor discrepancies needn't worry us". I don't want my creationist brethren trying to focus on minor discrepancies in the results of protein tests as if this defeated the hypothesis. The hypothesis _predicts_ minor fluctuation of results between protein tests. The minor fluctuations do nothing to refute the validity of the test results.

It's amazing, sometimes, how Mr. Dawkins seeds the field against theism. For example, here is an otherwise innocuous statement:

p 275, "It is clear that members of a particular school of taxonomy think of themselves as a beleagured band of brothers, like the eary Christians."

A rather odd description, but in itself not entirely unsuitable. I wonder why Mr. Dawkins chose that particular comparison. Perhaps he's trying to foster a common ground of understanding and sympathy between members of opposing 'sides', so they'd have one less minor obstacle hindering their common goal of discovering and reporting 'the truth' (whatever that truth should be). Ah, no, not quite, as the preceeding sentences make clear:

p 275, "I said that taxonomy was one of the most rancorously ill-tempered of biological fields. Stephen Gould has well characterized it with the phrase 'names and nastiness'."

Having established this position, _now_ Mr. Dawkins draws the (supposed) parallel with "the early Christians". He doesn't come right out and say, 'The early Christians thought of themselves facetiously and irrationally as a beleagured band of brothers; were rancorously ill-tempered; and could be well-characterized with the phrase "names and nastiness".' No, he prefers sly innuendo to that effect. I suppose that way he can avoid having to deal with historical rebuttal to his anti-idealized contention. (Remember, reader, all those times you got annoyed with the Church for whitewashing its own history? This is the same thing, except in reverse.)

p 275, "The following brief account of taxonomic schools of thought will probably annoy some members of those schools, but no more than they habitually infuriate each other so no undue harm will be done."

Assuming, of course, we can trust Mr. Dawkins to represent them accurately. Frankly, my confidence in him in this respect is not much better than if he had replaced "taxonomic schools of thought" with "creationistic schools of thought".

By the way, do you recall my point about how taxonomy
doesn't really provide evidence _confirming_ or _for_
evolution, because an evolutionistic interpretation of,
say, protein-test results requires biological evolutionary
theory's acceptance beforehand? Mr. Dawkins himself
confirms it here, as he starts his description of various
taxonomic theories:

p 275-276, "On the one hand there are those that make no
bones about the fact that their aim is openly to discover
evolutionary relationships. To them (and to me) a good
taxonomic tree _is_ a family tree of evolutionary
relationships." [italics his]

See? I'm not just making this up! Does this mean exactly
what I claimed earlier? One way to tell is by checking Mr.
Dawkins' description of the other main branch of taxonomy:

p 276, "But there are many taxonomists who proceed in a
different way, and for quite sensible reasons. Although
they are likely to agree that one ultimate aim of doing
taxonomy is to make discoveries about evolutionary
relationships, they insist on keeping the _practice_ of
taxonomy separate from the theory--presumably evolutionary
theory--of what has led to the pattern of resemblances.
These taxonomists study patterns of resemblances in their
own right. They do not prejudge the issue of whether the
pattern of resemblances is caused by evolutionary history
and whether close resemblance is due to close cousinship.
They prefer to construct their taxonomy using the pattern
of resemblances alone." [italics his]

Now you'll notice that Mr. Dawkins agrees that these
fellows are proceeding for quite sensible reasons (we'll
get to some of them in a minute.) The point is that this
group (whom Mr. Dawkins calls the 'pure-resemblance
measurers') wants the theory to be dependant on the data,
and not the data interpretation to be predetermined by the
theory. As Mr. Dawkins says:

p 276, "One advantage of doing this is that, if you have
any doubts about the truth of evolution, you can use the
pattern of resemblances to test it. If evolution is true,
resemblances among animals should follow certain
predictable patterns, notably the pattern of hierarchical
nesting."

So far, so good. However, we're going to see a bit of vagueness now in the approach:

p 276, "If evolution is false, goodness knows _what_ pattern we should expect, but there is no obvious reason to expect a hierarchical nested pattern." [italics his]

I agree; but at the same time, there is no obvious reason _not_ to expect a hierarchical nested pattern, either. After all, who are the main opponents of biological evolutionary theory? (We're ignoring the philosophical claims at the moment.) People who think that a supremely intelligent, coherent God designed, created and maintains an ordered, ultimately coherent (if often mysterious, to us) nature. Granted, I see no particular reason why God could not have created millions of species _without_ a hierarchical nested pattern; but, given that creationists essentially expect a God of order imposing order on Nature, then I suggest we might have at least prima facie reasons to expect something like hierarchical nested patterns (given the Creator hypothesis.)

The question (and the problem, for Mr. Dawkins) is what can be made of the conclusion. We have a few clear precepts here, and a few muddy ones; and the muddy ones don't exclude creationistic theism. Here are the precepts:

a.) If biological evolutionary theory is true, we should necessarily expect resemblances among animals to follow predictable patterns, notably hierarchical nesting.

b.) Consequently, if we don't find those patterns, the data would indicate the falsity of at least some (maybe all) of the evolutionary hypothesis.

c.) If biological evolutionary theory is false, _we don't know_ what kind of pattern to expect.

d.) If flat creationism is true (we're ignoring evolutionary theism for the moment; obviously, those proponents would be willing to go either way in terms of the biology), then _we don't know_ what kind of pattern to necessarily expect.

e.) If flat creationism is true, although we don't know what kind of pattern to _necessarily_ expect, a predictable

pattern such as hierarchical nesting would at least reflect the sort of God flat creationists believe in.

What does the data actually indicate? Resemblances among animals follow predictable patterns, notably hierarchical nesting. The simplest way to put this is that it's a point scored _for_ the evolutionists, but _not_ a point scored _against_ the creationists. And _both_ results should be made manifestly clear, to avoid misconceptions. What Mr. Dawkins only makes clear is that a point is scored for the evolutionists; he leaves you, the reader, to assume that this necessarily entails a strike _against_ the flat creationists.

But how far can we take this point in favor of evolution? Mr. Dawkins himself gives us the answer:

p 276, "If you assume evolution throughout the _doing_ of your taxonomy, this school insists, you can't then use the results of your taxonomic work to support the truth of evolution: the argument would be circular."

Which is precisely what I said above. As you might expect by now, Mr. Dawkins wishes to dent the sharp, spiky limitations of this observation:

p 276, "This argument would have force if anybody was seriously in doubt about the truth of evolution."

I have two replies to this:

1.) Let my skeptical readers ask themselves whether they would accept this defense from my side of the aisle. Let us say that I presented to you the Argument from Design--which I, Mr. Dawkins, and presumably you know by now is a circular argument purporting to conclude that God exists. You (or Mr. Dawkins, as he does elsewhere in TBW) point out that if I assume God as Creator throughout my observation of natural order, then I can't use the results of my observations of natural order to support the truth of God's existence. I concede this, but dismiss it (you may imagine a slight snort of derision on my part) with an airy 'Your reply would have force if anybody was seriously in doubt about the truth of God.' Now, would you accept that I have blunted the validity-slashing edge of the AfD's circularity? Or would you reply, "Booshwah! A circular argument is invalid whether or not anyone is in doubt of

its conclusions! That means you can't use it to prove God's existence!" If you made the first reply, feel free to put down SMB and TBW both, and make plans to attend church Sunday. If you made the second reply, then in principle you'll be agreeing with me when I say that this is precisely why a taxonomical interpretation which necessarily presumes biological evolutionary theory cannot itself be used as primary evidence or argument for that theory.

2.) The format of Mr. Dawkins' own book _requires_ that "this argument" has "force": he presents an argument by which he intends to convince serious doubters that evolution is true. At the very least, he presents an argument to defend "the truth of evolution" against the serious doubters. Either way, he presumes the existance of a not-inconsiderable number of serious doubters. (You know, those folks from Chapter 9 and the Introduction, whose numbers appear to be growing and who are apparently very succesful at manipulating the media and the educational system to the detriment of evolutionary theory.) So, thanks to the existence and format of TBW itself, we must agree that the argument of the 'pure-resemblance measurers' has force. How does Mr. Dawkins deal with the matter? By suggesting obliquely that the argument doesn't really have force! His source of recourse is about par for his course.

Mr. Dawkins, having... well, not 'aptly', but summarily... deflected the concerns of the 'pure-resemblance measurers', continues by describing in more detail the first main branch of taxonomists--the ones who presume from the outset the validity of evolutionary biology, as a means of interpreting the taxonomic data. Sometimes these scientists are called 'phyleticists', and Mr. Dawkins splits them again into two schools of thought: the 'cladists' and the 'tradional' evolutionary biologists. (p 276)

He requests, curiously, that we "_don't_ think of [traditional] as a pejorative name". [italics his] I'm not sure why I would; but it is Mr. Dawkins, not myself, who tends to denigrate something for being 'traditional' or 'ancient' (at least when he's speaking about religion and religious ideas. Hindsight note: see for instance page 282.) So though he need not worry about _me_ taking 'traditional' the wrong way, I have to marvel at the irony involved here.

At any rate, the cladists, Mr. Dawkins says:

p 276, "...are obsessed with branches. For them, the goal
of taxonomy is to discover the order in which lineages
split from each other in evolutionary time. They don't care
how much, or how little, those lineages have changed since
the branch point."

Of course, the same fellow who insisted we not take
'traditional' as a pejorative description decides to
describe the cladists as being "obsessed", which seems to
me quite a loaded word. I'll try not to think of it as a
pejorative, for the sake of the cladists. The 'traditional'
evolutionary taxonomists, meanwhile:

p 277, "...differ from the cladists mainly in that they
don't consider only the branching kind of evolution. They
also take account of the total quantity of change that
occurs during evolution, not just branching."

Mr. Dawkins illustrates (quite literally, actually, in an
effective little demonstration) how three different
animals--squid, herring and human--could be imagined in
terms of relationship. One way or the other, two of these
animals will be more similar to each other (or 'more
closely related', however we decide to define that) than
the third animal. Herrings and squid may share more common
features; or perhaps herrings and humans do; or perhaps
squid and humans do. Cladists, apparently, would simply be
concerned with choosing the best tree in terms of relative
similarities. To a cladist, if I understand Mr. Dawkins
correctly, the otherwise vast differences between a herring
and a human are not _for purposes of classification_ as
important as the even more significant differences between
either of them and the squid.

Mr. Dawkins tells us, on p 278, that:

"Cladists want to give special weight to features that are
recently evolved. Ancient features that all mammals
inherited from the first mammal, for instance, are useless
for doing classifications within the mammals."

I take this to mean the same as saying that there's no
point using the fact that mammals nurse their young with
milk in trying to decide which two of three mammals are
most closely related. Actually, a flat creationist would

probably agree with this, in principle; considering such a
feature "ancient" merely represents an _already-
established_ evolutionary viewpoint; and if such a
viewpoint has yet to be sufficiently established without
question-begging or game-rigging presumptions, then the
flat creationist would be within her thinking rights (or
'epistemological' rights, as philosophers say) to ignore
the 'ancient' qualification--and to ignore any conclusion
which requires the 'ancient' tag as a necessary
presumption.

I also take this to mean that these cladists must not be
the sort of 'real' gradualists Mr. Dawkins described
earlier in this chapter. I was under the impression from
that discussion that trying to pin down characteristics
that made an ancient ancestor one sort of species rather
than another (for example, whether Archeopteryx is a bird
or a reptile) was an almost meaningless exercise, because
"the distinction between modern birds, and modern non-birds
like mammals, is a clear-cut one only because the
intermediates converging backwards on the common ancestor
are all dead." (p 262) "The more our view of evolution
approaches the extreme of smooth, continuous change, the
more pessimistic shall we be about the very possibility of
applying such words as bird or non-bird, human or non-
human, to all animals that ever lived. An extreme
saltationist could believe that there really was a first
human, whose mutant brain was twice the size of his
father's brain and that of his chimp-like brother." (pp
263-264) So when the cladists (and other phyleticists?)
discuss "ancient features that all mammals inherited from
the first mammal", I think there should be some kind of
qualification about how they put those two ideas together.
It can only help Mr. Dawkins' argument, as far as I can
see.

p 278, "The methods they use for deciding which features
are ancient are interesting, but they would take us outside
the scope of this book."

I find this to be an amazing statement, myself. The very
subtitle of the book, "Why the Evidence of Evolution
Reveals a Universe Without Design" provides the exact scope
which Mr. Dawkins now says he doesn't intend to deal with.
Imagine, if you will, the claim of a theist writing a book
on the Argument from Design. In his subtitle, he clearly
states, "Why the Evidence of Nature Reveals a Universe with

Design". In his next-to-last chapter, having so far avoided
presenting any direct evidence for this contention, and
having relied primarily on necessary presumptions,
question-begging conclusions, and creatively convenient
redefinition of the same terms at multiple points within
the same book, now states that teleological philosophers
(the people who advocate the AfD) do indeed have methods
for demonstrating that nature must be designed. These
methods are "interesting", but (the author demures), "would
take us outside the scope of this book." I can only look
upon a statement like this with the greatest of suspicion.

p 278, "If pushed to the extreme, the obsession with
branchings alone could give strange results."

There's that loaded pejorative again. Hmm...

p 278, "It is theoretically possible for a species to be
identical in every detail to its distant cousins, while
being exceedingly different from its closer cousins."
[italics his]

I suspect Mr. Dawkins means convergence cases; for example
the platypus is very similar in several respects to its
(presmably very distant) avian relatives, yet is very
different from its closer cousins, the mammals.

Mr. Dawkins' own chosen example of two varieties of fish
species (Esau and Jacob, ha ha) sounds a bit similar to his
description of the Latmeria coelacanth from the previous
chapter. At that time he informed us that, though it looks
like a fish, it's actually more closely related to us (and
other mammals) than it is to other fish. If I'm reading him
correctly, the "traditional evolutionary taxonomist" would
recognize the "great similarity" between the modern
descendant (the Latmeria) of the ancient coelacanth, and
the modern descendants of its close relative, which (in
this example) would be all modern 'fish'. Thus, the
traditional taxonomist would classify Latmeria as a fish.
The strict cladist, on the other hand, would trace the
Latmeria straight back to its ancient ancestor, which also
happens to be one of the mammals' ancestors, and thus
classify the modern coelacanth together with mammals. (This
need not imply, I take it, that it would be classified _as_
a mammal, only that it and the mammals would together
inhabit a circle in the 'perfect nested' scheme exclusive
of true fish.) Because this method of classification is "at

least utterly logical and clear", Mr. Dawkins doesn't mind
much which of the two methods a taxonomist uses, as long as
the taxonomist clearly _specifies_ which method he's using.

Turning back to the pure-resemblance measurers (the ones
who "agree to banish evolution from their day-to-day
thoughts while they do taxonomy"), Mr. Dawkins splits
them into two sub-schools as well: the 'pheneticists' (or
'numerical taxonomists' or, as Mr. Dawkins will call them,
the 'average-distance measurers'), and the 'transformed
cladists'.

Again, the average-distance measurers _are_ proponents of
evolution (at least Mr. Dawkins tells us they _all_ are, p
280.) However, their aim seems to Mr. Dawkins to be "all of
a piece with the laudable one of avoiding preconceptions."
(p 280)

p 280, "They are consistent in that they don't even assume
that the pattern of resemblance will necessarily be a
simply branching hierarchy. They try to employ methods that
will uncover a hierarchical pattern if one is really there,
but not if it isn't. They try to ask Nature to tell them
whether she is really organized hierarchically. [...] Their
methods are often rather sophisticated and mathematical,
and they are just as suitable for classifying nonliving
things, for instance rocks or archeological relics, as for
classifying living organisms."

The main problem (aside from the apparent fact that none of
this caution is really necessary, since no one "is
seriously in doubt about the truth of evolution", as you
may recall from back on p 276), seems to be that "methods
are not really available for achieving this aim" (though
Mr. Dawkins seems to respect them for trying.)

The average distance-measurers usually begin by measuring
everything they can about their animals--though apparently
in 1985 (and 1996?) bodily resemblances were still being
relied on rather than genetic resemblances. Each bodily
characteristic or measurement seems to be quantified as a
"dimension" in computer terms. (Mr. Dawkins notes that "you
have to be a bit clever about how you interpret these
measurements", though he decides not to go into this.) Once
this is done for all particular animals in the testing
group, each animal can be mathematically plotted in terms
of its average resemblance to any other animal. This

produces an index of average resemblance, and now the
computer can be programmed to scan the numerical distances
(which equal characteristic resemblances) and check for
hierarchical clustering patterns.

p 280, "Unfortunately there is a lot of controversy about
exactly which calculation method should be used to look for
clusters. There is no one obviously correct method, and the
methods don't all give the same answer."

Of course, neither did the genetic protein comparison tests
described earlier in this chapter, but I gather the
differences are more profound than that. Apparently, the
danger of preconceptions biasing the results still hasn't
been satisfactorily minimized, either (this may also be
part of what Mr. Dawkins meant when he said these
taxonomists had to be "a bit clever" about how they
interpreted the measurements). At any rate, though these
fellows have gone somewhat out of fashion (at least in
1985), Mr. Dawkins expects a come-back and seems also to
expect some useful discoveries from them ("this kind of
'numerical taxonomy' is by no means easily to be written
off". (p 281))

Going back a bit to p 279, and his first mention of the
'transformed cladists', we get a bit of indignation from
Mr. Dawkins:

"This is a poor name, since the one thing these people are
not is cladists! [italics his] When Julian Huxely
invented the term clade he defined it, clearly and
unambiguously, in terms of evolutionary branching and
evolutionary ancestry. A clade is the set of organisms
descended from a particular ancestor. Since the main point
of 'transformed cladists' is to avoid all notions of
evolution and of ancestry, they cannot sensibly call
themselves cladists."

I guess we'll see in a minute whether their whole point is
to avoid _all_ notions of evolution. After all, the
'numerical taxonomists' Mr. Dawkins just discussed _do_
accept evolutionary theory; they're just trying to make
sure the results they get from the data aren't pre-
interpreted by evolutionary theory. As Mr. Dawkins himself
admits,

p 279, "The reason they [call themselves 'transformed cladists'] is one of history: they started out as true cladists, and kept some of the methods of cladists while abandoning their fundamental philosophy and rationale."

However, before we actually get to a description of their methods and ideas, it seems to me at least possible to suppose that these people are hoping to lend credence to cladist _conclusions_ by checking to make sure the data actually supports the conclusions, not by forcing the data to fit the presupposition. If that were true, there might be a bit more sense in calling themselves 'cladists'.

I was utterly unsurprised, given Mr. Dawkins' "pejorative" statements here (considerably moreso than merely ascribing 'obsession' to the cladists), to discover he believes:

p 281, "It is from within this group that the 'nastiness' usually emanates."

At any rate, the transformed cladists agree with the pheneticists that presuming evolution as a necessary interpretative factor before going to the data is a fallacious way of confirming evolutionary theory. Like the cladists (who do presume evolutionary theory as a necessary interpretive) the transformed cladists are interested in figuring out resemblances by discovering the best relationship tree. Both sorts of 'cladists' "pick out certain kinds of characteristics as taxonomically important, other kinds of characteristics as taxonomically worthless." (p 281) With the pheneticists, the transformed cladists:

"...agree... to leave open the question of whether the pattern of resemblance reflects evolutionary history. But unlike the [average] distance measurers, who, at least in theory, are prepared to let Nature tell them whether she is actually hierarchically organized, the transformed cladists _assume_ that she is. It is an axiom, an article of faith with them, that things are to be classifed into branching hierarchies (or, equivalently, into nested nests.)" [italics his]

Leaving a contemplation of Mr. Dawkins' own articles of faith as an exercise for the reader, I note with some interest that:

p 281, "[Transformed cladists] would not subscribe to the
point I made with my library comparison, that evolution is
the only sound basis for a unique hierarchical
classification."

In case anyone has decided that I must be a transformed
cladist (since I argued a similar point earlier), let me
point out the major difference between us on this score:
the transformed cladist believes that his methodology can
be used to classify stones, planets, library books and
Bronze Age pots--that these things also fit into a
hierarchical nesting pattern, which can be discovered. That
was not my point; I stated that such patterns aren't unique
to evolutionary theory because any real branching process
in history affords the same perfect nesting. Or, put the
other way around (which is the better way to put it), the
perfectly nested hierarchies of biological evolutionary
theory will occur precisely because evolution is
(presumably) a real historical process with temporally
distinct cause/effect branchings. Real historical processes
have perfectly nested hierarchies of events.

Having thought about it, though, I have decided I am in
error on this point, and that Mr. Dawkins is correct,
though I've just now figured out what the distinction is.
Real historical cause/effect processes have the _potential_
to be perfectly nested; but an evolutionary process has a
specific characteristic which all but guarantees perfect
nesting: species cannot interbreed. The coelacanth (under
the cladist classification) fits into a circle which
excludes, as such, true fish. (Though the true fish circle
and the coelacanth circle would both be within at least one
larger circle.) It is grotesquely unlikely that a
descendant of either species will be able to interbreed
with the other descendant; if this happened, the circles
would no longer be perfectly nested. Mr. Dawkins admits
that this sort of thing may have happened once or twice in
the Earth's history, but the rule is pretty close to being
ironclad. I still think it a tad presumptious to state
flatly that no other historical process can be perfectly
nested; but at least now I see why Mr. Dawkins felt he
could make the claim--I think I can agree that, though
there may be theoretically another sort of historical
process with characteristics which allow it to reach this
near-perfect potential, the existence of such processes
must be extremely rare (even more rare than I originally

anticipated, and considerably more rare than the
transformed cladists would suggest.)

Let's go back and check my own example, for instance, to
see if I fairly compared it. Let me begin by noting that
one of my replies to Mr. Dawkins' description of
implications of cladistic taxonomy still stands: there are
other areas of classification in other studies where words
like 'true' and 'false' could be applied. Mr. Dawkins is
being restrictive with the 'uniqueness' of _this_ sort of
claim. So, for instance, it is either true or false that
Luke's Gospel was released (as such) before Mark's Gospel
(as such). Similarity of phrases within both Gospels
indicate a genetic relationship between them; either one
depends on the other, or both depend (at those points) on
the same previously existing material. The general
conclusion, at present (with some good and bad argument
supporting it) is that Luke used Mark's gospel as a source
for his own. In terms of cause and effect, up to this point
we might have a rather complicated, but still viable,
perfect nesting of historical cause/effect. However, there
was nothing to stop (or perhaps I should say 'Someone'
didn't choose to stop) a later editor from adding a late
section to the tail-end of Mark, almost certainly partly
inspired by Luke's Gospel. The effects have, in essence,
cross-breeded to produce the documents we now have. We no
longer have a perfect nesting hierarchy of effects from
causes. Therefore, I was wrong to that extent. However,
there is still an objectively real 'history' of the
development of these texts; just as there is an objectively
real 'history' of _any_ process, whether or not we can
manage to discover it. (For example, there would be a real,
potentially discoverable history to my mousetrap-filled
football field chain reaction experiment. That one, by the
way, I also mistakenly described as being perfectly nested,
because one set of effects in its process could at any
point reconverge with another set of effects; two different
flying moustraps from two otherwise different chains of
reaction might both land on a single loaded mousetrap and
cause an indistinguishable common effect. The circles would
no longer be perfectly nested.) And to the extent that Mr.
Dawkins implies that only cladistic taxonomy provides an
objectively real process with one objectively real
'correct' tracing of cause and effect, I continue to
disagree with him. Perhaps he did not mean to imply
cladistic taxonomy's "uniqueness" to quite that degree, but
that's the impression I received from his topical

construction, so perhaps he should clarify himself in
future editions.

Mr. Dawkins concludes the chapter with a discussion of the
prime problem for the transformed cladists' theory (and,
not quite consequently, the prime problem with some
transformed cladists' communication of their conclusions.)
I actually thought this section to be fairly well thought-
out, so I'll report some key quotes with little attached
commentary.

p 282, "Like all true cladists, they would begin, at least
in principle, by writing down all possible bifurcating
trees, and then choosing the best. But what are they
actually talking about when they consider each possible
'tree', and what do they mean by the best? To a true
cladist... of all the 15 conceivable family trees uniting
four animals, one and only one must be the correct one. The
history of the animals' ancestors really did happen, in the
world. There are 15 possible histories... Fourteen of those
histories must be wrong. Only one can be right; can
correspond to the way the history actually happened. [...]
It may not be easy to be sure _which_ one is the correct
one, but the true cladist can at least be sure _that_ not
more than one is correct. But what do the 15... possible
trees, and the one correct tree, correspond to in the
nonevolutionary world of the transformed cladist? [...] The
transformed cladist refuses to allow the concept of
ancestry to enter his considerations. [...] But on the
other hand he insists that classification must be a
branching hierarchy. So, if the 15... possible hierarchical
trees are not trees of ancestral history, what on earth are
they? [...] It is certainly not possible, in the
nonevolutionary world of the transformed cladist, to make
strong and clear statements such as 'only one out of the
945 possible trees uniting 6 animals can be right; all the
rest must be wrong.'" [italics his]

Essentially, this means that the traditional cladists are
improperly mixing two concepts: that there must be one
precisely correct relationship between species (the
'pheneticists' would presumably be satisfied with merely
estimating how close certain species are to each other in
resemblance); and that the presumption of a cause/effect
history for the animals' relationships (for instance,
evolutionary biology) cannot be introduced for fear of
predetermining the results of the data. But it is the

second concept which provides the grounds for asserting the first concept.

Of course, the transformed cladist can look to other grounds for presuming that there must be one objectively correct tree of resemblance classification:

p 282, "There is nothing for it but to appeal to ancient philosophy for some wooly, idealistic notion that the world just is organized hierarchically; some notion that everything in the world has its 'opposite', its mystical ying or yang. It never gets much more concrete than that."

And so, Mr. Dawkins summarily dismisses any philosophical grounds the transformed cladists might apply to; and since he supplies no arguments for dismissing them, the reader is encouraged to consider their age ("ancient", "woolly") as the prime reason for dismissal. So much for his asking us not to consider 'traditional' a pejorative, I guess.

For what it's worth, by the way, the woolly ancient philosophies Mr. Dawkins conjures up for dismissal include no variety of Christianity I can recall. The fundamentalistic creationists of our day, as I noted earlier, would have no problem with this. Such thinkers are not limited to stating that there _must be_ one correct resemblance classification, any more than they are obligated to state that there _must not_ be one. A creationist who supports some variety of biological evolutionary theory, of course, could be any type of taxonomist without self-contradiction.

And now Mr. Dawkins is about to make a very good point; one which I made myself earlier this chapter (it's nice to see some collaborative agreement):

p 283, "Not content with a perfectly sensible belief that there is something to be said for leaving evolutionary and ancestral assumptions out of the _practice_ of taxonomy... some transformed cladists have gone right over the top and concluded that there must be something wrong with evolution itself! [...] They have decided, perhaps rightly, that they can do taxonomy better if they forget about evolution, and especially if they never use the concept of the ancestor in thinking about taxonomy. In the same way, a student of, say, nerve cells, might decide that he is not aided by thinking about evolution. [...] This is a defensible

position. But you can't reasonably say that, because you don't need to use a particular theory in the day to day practice of your particular branch of science, therefore the theory is _false_. [...] [I]t isn't logical. A physicist certainly doesn't need Darwinism in order to do physics. [...] But he could not sensibly conclude from this that it is therefore _false_! Yet this is essentially what some of the leaders of the school of transformed cladistics seem to have done." [italics his]

And, of course, I agree; as I noted above in my comments concerning page 276. Let me repeat myself with the relevant paragraph: What does the data actually indicate? Resemblances among animals follow predictable patterns, notably hierarchical nesting. The simplest way to put this is that it's a point scored _for_ the evolutionists, but _not_ a point scored _against_ the creationists. And _both_ results should be made manifestly clear, to avoid misconceptions. What Mr. Dawkins only makes clear is that a point is scored for the evolutionists; he leaves you, the reader, to assume that this necessarily entails a strike _against_ the flat creationists.

So, let the flat creationists take heed and play fair here--their abuse of the positions of some transformed cladists is, after all, "the only reason I have troubled readers with the topic of transformed cladism at all." (p 284) But let the evolutionists play fair here as well. The pheneticists are correct: it is impossible to _justify_ a belief in biological evolutionary theory by using conclusions which require the prior validity of evolutionary theory in order to even work.

I should think that Mr. Dawkins would be sympathetic, in principle, to my call for fair play. He certainly seems incensed enough, in the final paragraph:

p 284, "There is no doubt at all that remarks like 'Darwinism ... is a theory that has been put to the test and found false', coming from established biologists on the staff of a respected national museum, will be meat and drink to creationists and others who actively have an interest in perpetrating falsehoods."

Again, welcome to the club, Mr. Dawkins. I could very easily rewrite this statement from examples in my own field: There is no doubt at all that remarks specifically

undercutting the validity of Christianity's proposed
history, coming from established theologians on the staff
of respected divinity colleges, will be meat and drink to
philosophical naturalists and others who actively have an
interest in perpetrating falsehoods. Nevertheless, it
happens.

p 284, "This is the only reason I have troubled my readers
with the topic of transformed cladism at all. [...] Of
course it is difficult to pin down the precise identity of
ancestors, and there is a good case for not even trying to
do so. But to make statements that encourage others to
conclude that there never _were_ any ancestors is to
debauch language and betray truth. Now I'd better go out
and dig the garden, or something."

And so, with an indignant huff, Mr. Dawkins departs to
prepare his final chapter. And in the process, as I've
argued extensively in this chapter (and in previous
chapters), he slams headlong into the massive gnarly tree
he himself has planted; for under his own implications, his
righteous indignation, though a real feeling in his
biophysical makeup, cannot possibly be valid as such. As
long as his feelings are merely the reactions and
counterreactions of numerous blind, automatic, nonrational,
nonmoral entities (particles of physical matter and energy,
in this case), he cannot be _right_: there can be no such
thing as "debauching" language, or "betraying" truth. His
response becomes merely an interesting, perhaps even
entertaining, fact about his physical makeup. ('Ha! Look!
Mr. D is venting again!')

D, D, D of the jungle; friend to you and me. ahh-Ahhhh! ah-
ah-ahhAhhh! Watch out for that...

Tank-or-tricyle time...;
aka, Chapter 11: Doomed rivals

Huzzah! The last chapter! Well, Mr. Dawkins' last chapter--
I have a couple more to go. Nevertheless, here is not only
the light at the end of the tunnel, but the end of the
tunnel itself. It seems ages since I sat down for the first
time to record my impressions of _The Blind Watchmaker_;
seven months ago, mid-February 1999. (I hope it hasn't
quite seemed like ages since you began reading this book!)
One more set of walls to pole-vault; one more parry-thrust
duel. I'm intensely curious to see exactly how he intends
to end the book; a summary? A return to philosophy? Will he
finally get to some positive evidence? Will he deal with
some of the holes I've noted earlier? So far I've resisted
peeking ahead substantially; and let me tell you, given
_my_ reading habits that was quite an accomplishment! I'm
excited, and nervous, and even a little worried. Does that
surprise you? It shouldn't; Mr. Dawkins _has_ been doing
his job for quite a long time. I've even learned some
interesting biological lessons from this book. No, I'm
serious--I'm not being sarcastic! In fact, to be fair, I'll
even list them at the beginning of my twelfth chapter. You
might be surprised how much I actually _appreciated_ his
book. It makes me wonder what he could have accomplished
with a more solid foundation than I've uncovered so far;
but perhaps this chapter will pull it all together into a
coherent whole.

Well, enough stalling I suppose; it's time to dive, swords
spinning, into the fray one last time...

(Note: the 1996 edition of TBW includes an extended
appendix wherein Mr. Dawkins explains how to run his
biomorph program, which is sold with some copies of his
book--though not with mine, as it turns out. I have read
it, just to be thorough, but the points he raises--and the
fallacies--are well illustrated earlier in TBW. However, I
was tickled enough by his description of how he grew the
word MACINTOSH with his biomorphs, to include a mention of
it in an earlier chapter.)

Skipping past Mr. Dawkins' de rigure opening barb regarding
"serious biologists", he pretty well summarizes his overall
targets for this chapter: Lamarckism, neutralism,
mutationism, and creationism. Punctuated evolution (covered
back in Chapter 9), although often described in terms which

makes it _seem_ anti-Darwinian, turns out to have been
merely a minor variation of orthodox Darwinism; so there
was no point including it here. The taxonomy of transformed
cladism (just dealt with at the end of chapter 10) might or
might not be considered oppositional to Darwinism,
depending on how rigorously its adherents push some of its
tenants; but it need not necessarily be anti-Darwinian. I
can see, though, how ending the previous chapter with it
would lead into a discussion of the direct challengers to
Darwinism.

However, I hope that by now you'll recognize that there are
'creationists', and there are 'creationists'. Probably any
creationist would disagree with Darwin's _philosophical_
leanings; so perhaps Mr. Dawkins' statement that these
theories (creationism included) "go flatly against the very
spirit of Darwinism" (p 287) holds some water. However, not
every creationist would disagree with the _science_ Darwin
advocated. Mr. Dawkins, so far, has been very limited in
the sort of 'creationist' he skewers in this book; and,
though it's easy to score some points on flat creationists,
I have also noted that some of Mr. Dawkins' particular
ideas still do not deal with them. Actually, I was rather
surprised how, in the last few chapters, Mr. Dawkins'
'arguments' and 'evidence' ended up presenting conclusions
which (minus the overriding philosophical filters) a flat
creationist might even accept! Whether Mr. Dawkins intends
(or is even capable) of dealing with some creationists who
have more philosophical muscle than provided by the
"backwoods" "fundamentalists" remains to be seen.

Mr. Dawkins decides not to finish the book with a look at
the pros and cons of the 'evidence' presented by these
opponents.

p 287, "In this chapter I shall take a different tack,
largely because so many other books have examined the
evidence and concluded in favour of Darwinism."

Perhaps this explains why 'evidence' is so scanty
throughout TBW!

p 287, "Instead of examining the evidence for and against
rival theories, I shall adopt a more armchair approach."

When I read this, I recalled his line from back on page 28:
"I personally, off the top of my head sitting in my
study..."

p 287, "My argument will be that Darwinism is the only
known theory that is in principle _capable_ of explaining
certain aspects of life. If I am right it means that, even
if there were no actual evidence in favour of the Darwinian
theory (there is, of course) we should still be justified
in preferring it over all rival theories." [italics his]

Well, as you should know already, he's stepping directly
onto my ground; for of course, I've been maintaining pretty
steadily throughout this book that the very _principles_ of
Darwinism make it _incapable_ of explaining certain aspects
of life. I suppose we're finally going to see a head-to-
head clash here! Given the scanty evidence actually
presented in TBW _for_ Darwinian theory, I find myself
suspicious of the last sentence as something of a last-
chapter save. We shall see...

He's leaning pretty heavily on those 'principles' in this
chapter, though:

p 288, "The Darwinian theory is **in principle** capable of
explaining life. No other theory that has ever been
suggested is **in principle** capable of explaining life. I
shall demonstrate this by discussing all known rival
theories, **not the evidence for or against them**, but
their adequacy, **in principle**, as explanations for
life." [italics mine]

Oh, this is going to be good! I'm all a-quiver with
anticipation... First, let me go back a bit and pick up a
spare:

p 288, "One way in which to dramatize this point is to make
a prediction. I predict that, if a form of life is ever
discovered in another part of the universe, however
outlandish and weirdly alien that form of life may be in
detail, it will be found to resemble life on Earth in one
key respect: it will have evolved by some kind of Darwinian
natural selection."

I make my own counter-prediction: I predict that, if a form
of life is ever discovered in another part of the universe,
however outlandish and weirdly alien that form of life may

be in detail, it will be found to resemble life on Earth in
one key respect: if we Terrans are still primarily
evolutionistic in our scientific and philosophical
outlooks, it will be accounted for by our current
evolutionary theories--_BE THEY RIGHT OR WRONG_. If we
Terrans are, for some reason, primarily creationistic in
our scientific and philosophical outlooks, it will be
accounted for by our current creationistic theories--_BE
THEY RIGHT OR WRONG_. And, of course, any mix of the above.
Bringing up "life on another planet" is indeed "dramatic";
but in terms of practicality you might as well replace it
with "another outlandish and weirdly alien form of life
from under our oceans". I would _like_ to be able to
predict that, if we find alien life, it will be accompanied
with undeniable and crystal-clear evidence of having been
instantaneously created; but really, there's nothing in
creationism that even pretends to guarantee this, even
among the flat creationists. We'll interpret the new
lifeform in just the way we've been interpreting the old
ones we already know; and if we still have holes and are
working under a false doctrine, we'll assign that same
false doctrine to the alien life as well. This is no
'biggie'. The task is to plug the holes here and now with
the best information and reasoning we can provide. (Note:
I'm not claiming that Mr. Dawkins is himself putting off
the ultimate validity of evolution, and evolutionism, until
a hypothetical date in the future. I'm only pointing out
that his prediction isn't really much of a prediction. It
won't surprise me in the least if we eventually discover
alien life; I don't want people on either side getting
hyper about it beforehand. Nature is Nature. That's why
we're supposed to be looking at "principles" in this
chapter.)

p 288, "First, I must specify what it means to 'explain'
life."

Yes, that certainly will be useful.

p 288, "There are, of course, many properties of living
things that we could list, and some of them might be
explicable by rival theories. [...] There is one particular
property of living things, however, that I want to single
out as explicable _only_ by Darwinian selection."

Real reasoning ability? Real morality? The things that
could potentially ground his own judgments in this book

without reducing his own behavior to ultimately nonmoral, nonrational reactions and counterreactions? Ah, no; and, to be fair, neither of these things would count necessarily (as far as we can tell, anyway) as a particular property of _all_ living things. Let's see what he suggests:

p 288, "This property is the one that has been the recurring topic of this book: adaptive complexity."

Heh. Heh-heh. Not only am I going to win, I'm going to win HUGE! Because, of course, his means of describing the phenomena surrounding adaptive complexity has been one of the wormiest bits of underpinning in TBW. This is his chance to correct everything that has gone before; will he do it, though? Can he get through one, single, solitary paragraph without setting up a 'principle' that will end up failing his purpose utterly?

p 288, "Living organisms are well fitted to survive and reproduce in their environments, in ways too numerous and statistically improbable to have come about **IN A SINGLE CHANCE BLOW**." [italics mine, obviously]

Victory! He's going to try once more to convince us that an intentional creative act of any sort can be equated with "a single chance blow"! (John Ward, former announcer for the University of Tennessee Volunteers, "It's... no... good! It's... no... good! The ball has missed the uprights!" Strike up Rocky Top on that 300-piece marching band, boys, I'm coming home...!)

p 288, "Two or three of an eye's well-'designed' features could, conceivably, have come about in a **SINGLE LUCKY ACCIDENT**. It is the sheer number of interlocking parts, all well adapted to seeing and well adapted to each other, that demands a special kind of explanation **BEYOND MERE CHANCE**." [italics mine, again obviously]

<fade back in to the triumphant chorus in the backwoods> "Rocky Top!... You'll always be... home sweet home, to meeee... Good, Ol' Rocky Top!" Everyone! "Rocky Top, Tennessee! Rocky Top, Tennessee..." <fade out again>

p 288, "First, let us take Darwinism's most prominent historical rival, Lamarckism."

Okay, okay, everyone settle down... He could still have
something useful to say here and there over the next few
pages... Yes, Bubba, I know that calling Lamarckism
"Darwinism's most prominent historical rival" flies
hilariously in the face of his own book's _raison d'etre_.
No, you didn't mistake the subtitle of TBW; it's not "Why
the Evidence of Evolution Reveals a Universe Where An
Individual's Acquired Physical Characteristics Are Not
Inherited By Future Generations". Just cut him some slack;
I think he'll have something interesting to say here...

(Note: the Chevalier de Lamarck is actually a title of
nobility--Knight of Lamarck, or more phonetically Cavalier
of Lamarck. This fellow's real full name was Jean Baptiste
Pierre Antoine de Monet. However, historians refer to him
as "Lamarck".)

Mr. Dawkins begins by pointing out that Lamarckism did not
begin as an opponent of Darwinism, for quite a good reason:

p 288, "When Lamarckism was first proposed in the early
nineteenth century, it was not as a rival to Darwinism,
because Darwinism had not yet been thought of."

Lamarck was indeed in favor of evolution, though he had
some different ideas about how the _mechanism_ of evolution
worked. Mr. Dawkins admits (p 289) that it was:

"...the best theory of the mechanism of evolution that
anyone could come up with at the time, but there is no
reason to suppose that, if the Darwinian theory of
mechanism had been around at the time, he would have
rejected it. [...] This is not a history book, and I shall
not attempt a scholarly dissection of exactly what Lamarck
himself said."

I recommend, as a rather interesting history of the
development of scientific thought in the West (including a
nice little section on Lamarck), Nancy R. Pearcey and
Charles B. Thaxton's _The Soul of Science: Christian Faith
and Natural Philosophy_. It even references Mr. Dawkins
from TBW a couple of times, in a non-hostile way (i.e., as
an expert!) For the moment, suffice it to say that Lamarck
did believe in God, though like some (not all) scientists
of his day he was a nominal deist--he allowed that God's
existence helped account for one or two philosophical
enigmas, but maintained that God never acted in Nature.

Instead, he held a partly mechanistic, partly neo-Platonic view of Nature. That means he considered Nature to be a vast interlocked machine (with no interruptions from 'outside'); and that Nature itself either was alive or its smallest particles had rudimentary life and mentality. This was the force behind evolution, as far as he was concerned. Although I don't _know_ that he would have rejected Darwin's version of evolution, had he lived to see it, I think he might have had philosophical reasons to; Darwin's highly mechanistic view of Nature would have collided sharply in several key respects with Lamarck's view of Nature as deeply alive and at least quasi-sentient. After all, one of Darwin's contemporaries, Horace Bushnell, rejected Darwinism on precisely those philosophical grounds.

Mr. Dawkins, on page 289, wants to extract two non-mystical elements from Lamarckism in order to give it a "fighting chance"; but frankly this is stacking the deck more than a bit. Lamarck's theory runs on the mainspring of his organicist view of Nature; taking his ideas out of that context and injecting them into a fully mechanistic view of Nature for 'fair' comparison isn't quite fair. After all, it's not as though Mr. Dawkins has bothered to _prove_ or even really to _argue_ (in any sense) that Nature is utterly mechanical. He _assumes_ this as a starting premise. I don't think we should be surprised in the least if Lamarckism seems to knock while burning this fuel. Still, since some 'neo-Lamarckians' have made a go of this themselves (apparently), maybe he can compare apples to oranges (instead of onions to cans of Mountain Dew) sufficiently to take Lamarckism out. Let's see what he does from here.

There are two (non-'mystical') elements to Lamarckism, generally:

a.) "the inheritance of acquired characteristics"
b.) "the principle of use and disuse"

p 289, "The principle of use and disuse enables [individual] animals to become better at the job of surviving in their world, progressively better during their own lifetime as a result of living in that world."

So, for instance, Mr. Dawkins gives us such examples as a progressive tan (my grandfathers both had one of these);

horny, tough callouses on the hands and feet after a life
of hard manual labor (ditto); and, of course, body-
building. These characteristics are _acquired_ (one way or
another) by particular individuals. Lamarckism says that
such characteristics will then be passed on to future
generations.

Now, contrary to what Mr. Dawkins says next, Lamarck did
not "simply incorporate the folk wisdom of his time" (p
290) to come up with Lamarckism. Either that, or Mr.
Dawkins is contradicting himself again because he said not
much more than one page earlier that Lamarck used "the
best theory of the mechanism of evolution that
anyone could come up with at the time". (p 289)
"Anyone" presumably includes the best and brightest
thinkers working with what was available to them, not
merely the... shall we say... "backwoods" people, whose
image Mr. Dawkins conjures up with the term "folk wisdom".
(He even provides a pithy autobiographical example of the
sort of "folk" he means. Shortly afterwards he puts "folk
wisdom" on the same par with "fairy tales".) What Lamarck
did was apply this prevalent idea to the burgeoning theory
of evolution. He himself probably got it from a neo-
Platonic scholarly background; and granted, that's a pretty
old tradition. Then again, a purely mechanistic philosophy
(such as the modern sort advocated by Darwin and Mr.
Dawkins) has been around consistently at least since the
time of Democritus and Archimedes. It had been extremely
popular in physics, even in the Middle Ages. Darwin's own
philosophical presuppositions (which he attached to biology
with a persuasive argument) stretch back a long, long,
dusty, "woolly" way; quite a bit before Christianity, I
might add. The Good News itself is fairly recent news,
comparatively. If we really should reject a general
philosophical tack purely on its relative longevity in
Western history, well then, I suppose we must. I expect to
see y'all in church, Sunday...

Well, maybe not. Why is it I suspect that the tendency to
trashcan "woolly" philosophical beliefs will suddenly melt
away, if this little fact ever becomes widely known? How
cynical of me...

Here's a bit of interesting trivia about the theory of
acquired characteristics:

p 290, "Darwin himself believed in it, but it was not a part of his theory of evolution so his name is not linked to it in our minds."

Hmmm... maybe he's alluding to racist assumptions of white superiority, from back on pages 113-114?

At any rate:

p 291, "All evolutionary advancement, according to pure Lamarckian theory, follows this pattern. The animal strives for something that it needs. As a result the parts of the body used in the striving grow larger, or otherwise change in an appropriate direction. The change is inherited by the next generation and so the process goes on. This theory has the advantage that it is cumulative--an essential ingredient of any theory of evolution if it is to fulfill its role in our world view, as we have seen."

Though its cumulative-ness hardly increases the probability of the total process occurring, as we have also seen. (Of course, I do agree that biological evolutionary theory works best with a cumulative process. That's virtually what makes it 'evolutionary', come to think of it...)

Obviously, Lamarckism will tend to be attractive to certain people for _philosophical_ reasons, even if there isn't any hard evidence for it. Mr. Dawkins gives us the example (on page 291) of his colleague the Marxist historian, who knew all the facts seemed to be against Lamarckism, yet still wished it were true because "it seemed to offer such positive hopes for the betterment of humanity". (One of the Marxist philosophical pillars is either the presumption or the conclusion--depending on whom you listen to--that humanity's drive to perfection is an inevitability thanks to social dynamics and historical pressures.) Mr. Dawkins also references George Bernard Shaw, a popular pantheist of the of the neo-Platonic tradition (when it came to biology--curiously, as far as physics was concerned he was a mechanist) who embraced the theory of acquired characteristics and rejected Darwinism on philosophical grounds. Rather ironically, given his admiration of Newtonian physics, Shaw wrote of Darwinism (quoted by Mr. Dawkins):

p 291, "But when its whole significance dawns on you, your heart sinks into a heap of sand within you. There is a

hideous fatalism about it, a ghastly and damnable reduction
of beauty and intelligence, of strength and purpose, of
honor and aspiration."

Some readers will, I suppose, see some parallels here with
the book you're now reading! But make no mistake: I am not
a pantheist. Furthermore, it is not the "ghastly and
damnable reduction" in and of itself that I consider the
problem; but that naturalists like Mr. Dawkins are highly
inconsistent about to what extent their own theories imply
this statement. Note: in a bit of further irony from Mr.
Shaw; despite the fact that he could have realized that a
rigorous mechanistic physicism leads to the same "ghastly
and damnable reduction", he continued to advocate it until
the advent of quantum physics shattered this foundation as
well, plunging his perception of an ordered world into one
of chaos. In a crowning bit of irony, Isaac Newton--whose
physical 'determinism' Shaw so greatly admired, and which
Shaw used for scorning Protestants and Catholics alike--was
himself a deeply devout orthodox Christian, who used his
experiments and calculations for apologetic purposes as a
defense of the faith.

Mr. Dawkins does allow that Shaw, and Arthur Koestler whom
he mentions as an advocate of "an obscure version of
Lamarckism" (remember Koestler's name from waaay back on
page 38? He's one of the nefarious cads Hugh Montefiore
referred to; now we know why Mr. Dawkins considered this to
be a bad thing), are at least "individuals who thought for
themselves." (p 292) Compared to T. D. Lysenko (the
director of the Soviet Union Institute of Genetics whose
"fervent, dogmatic belief in the inheritance of acquired
characteristics" crippled the U.S.S.R.'s genetic research--
partly by crippling and killing its geneticists), these
fellows' "eccentric views on evolution have probably not
been very influential", Mr. Dawkins says. (p 292) I suppose
compared with Lysenko, they weren't. (And by the way, were
we supposed to be feeling moral outrage at the thought of
those scientists unjustly imprisoned and killed? That's
some of Mr. Dawkins "apparent altruism" kicking in again, I
guess...) On the other hand, Mr. Dawkins thought
Montefiore's book (which relies somewhat on Koestler's
arguments) was potentially influential enough to spend
quite a bit of time on it, earlier. Unless he was merely
picking on a straw man, of course. (Gasp. No.)

Having discussed a bit of the history of Lamarckism, Mr.
Dawkins proceeds to make a rather odd statement:

p 292, "It is not possible to prove that acquired
characteristics are never inherited. For the same reason we
can never prove that fairies do not exist."

Yet, Mr. Dawkins seems pretty confident about another
entity, the belief in Whom he would probably equate to the
level of belief in 'fairies': "Why the Evidence of
Evolution **Reveals** a Universe **Without Design**" is
pretty straightforward.

Zipping past the discussion of faked fairy photographs and
the Texas dinosaur/human footprints (there _they_ are
again; you'd think in a book of this sort he might deign to
explain _why_ they must be fake, if they're supposed to be
so important to the creationists), and their relation to
supposed evidence for acquired inheritance (as we see, his
strategy of avoiding examining the evidence pro and con
doesn't prevent him from simply asserting the cons--how
convenient); we scoot into a somewhat more in-depth
discussion concerning Lamarckism's relationship with
embryology. (Remember back in Chapter 4, he promised to
return to this topic. Here it is.) But first he makes a
preliminary case for how we should be leery of overturning
well-establised discoveries of science. (Hindsight note:
Although I agree with a large part of it, I'll still have
to turn aside for a rather lengthy discussion of it before
we get to the discussion about Lamarckism with embryology.)

He starts this preliminary by noting that there are certain
questions of fact which, though their existence might be
odd, he would in principle be prepared to accept, provided
sufficient evidence. For instance:

p 293, "I have seen no good evidence for the theory that
plesiosaurs live today in Loch Ness, but my world view
would not be shattered if one were found. I should just be
surprised (and delighted), because no plesiosaur fossils
are known for the last 60 million years and that seems a
long time for a small relict population to survive. But no
great scientific principles are at stake."

I thought this was rather refreshingly fair of him! There
have been so many scientists who are prepared _in advance_
to scoff at cryptozoological claims (note: cryptozoology

means the study of officially 'undiscovered' animals), that
taking a stand like this back in 1985 would have been brave
indeed. (For what it's worth, my own opinion about the
matter mirrors his precisely. You may feel free to debate
whether I consider that opinion 'fair' because I happen to
share it, or because I agree that this is an example of an
objectively responsible attitude toward the data.)

p 293, "On the other hand, science has amassed a good
understanding of how the universe ticks, an understanding
that works well for an enormous range of phenomena, and
certain allegations would be incompatible, or at least very
hard to reconcile, with this understanding."

I totally agree with this. However, I think sometimes
people misinterpret exactly what it means to understand how
"the universe" (that is, _nature_) ticks. And sometimes the
misinterpretation takes the form of a conclusion with a
hidden circular premise. For example, the statement "a good
understanding of how the universe ticks" might have hidden
behind it the premise 'There is nothing except the physical
universe'. There are certainly a number of allegations
which, _given_ this premise (that the physical universe
equals 'everything'), would be incompatible with our
understanding of "the universe". And rightly so, given the
premise. However, a conclusion reached by this method is no
argument _for_ the premise, because it depends on the
premise for its own strength. This shouldn't be very
difficult to grasp. The sceptic need only remember that, as
a similar example, the supernatural resurrection of Jesus
does not prove God's existence, because the proposition
"supernatural resurrection" contains properties of
definition that beg the question in advance. In either case
we are dealing with an improper procedure reaching an
improper conclusion. I think there _are_ proper procedures
by which you may reach (potentially, at least) positive
conclusions on these subjects; I am not advocating a
necessary (and ultimately inexcapable) agnoticism. But I
want you, the reader, to be wary about potential
misunderstandings as we follow Mr. Dawkins through this
point.

p 293, "For example, this is true of the allegation,
sometimes made on spurious biblical grounds, that the
universe was created only about 6,000 years ago. This
theory is not just unauthenticated. It is incompatible, not
only with orthodox biology and geology, but with the

physical theory of radioactivity and with cosmology
(heavenly bodies more than 6,000 light-years away shouldn't
be visible if nothing older than 6,000 years exists; the
Milky Way shouldn't be detectable, nor should any of the
100,000 million other galaxies whose existence modern
cosmology acknowledges.)"

Now there are quite a few points I wish to make regarding
this fragment.

a.) For what it's worth, I'm not out to defend this view;
in some cases for reasons which I'll shortly discuss below.

b.) I agree that allegations can be made spuriously on
biblical grounds. Before I'm lynched by my brethren, I'll
ask them to remember that this is one of the chief grounds
for the concept of a 'heresy'. Thus, I think we can all
agree on this principle, since virtually all of us theists
who use Scripture recognize the existence of heresies
(though obviously our lists of particular heresies are
going to vary somewhat.)

c.) That being said, I do not consider _all_ allegations
made on biblical grounds to be spurious. (Mr. Dawkins
doesn't come right out and state that they are, but I want
to head off an implication at the pass.) For instance,
allegations of the Bible that fall into the class of
archaeology have been verified again and again. (In fact,
the Bible has a spectacular record in this category.)
Therefore, I do not recognize some sort of inherent
property of Scripture which renders all its allegations
necessarily spurious.

d.) Furthermore, I am entirely prepared to acknowledge, in
principle, that particular allegations drawn from Scripture
by particular individuals may be spurious thanks to faulty
argumentative procedure (vicious circularity, beggings of
the question, etc.) Such examples must be judged on a case-
by-case basis, of course. You will notice that I've worded
this in such a way as to include allegations from _anyone_,
sceptic, orthodox believer, or what-have-you.

e.) Concurrently, I also wish the reader to recognize that,
in principle, particular allegations of spuriousity may
themselves be spurious, thanks to similarly faulty
argumentative procedures. Again, this has to be judged on a
case-by-case basis.

f.) Even among the flat creationists, not every theory requires the total creation of all the universe 6,000 years ago. Some only put Man's creation, as such, at that date.

g.) Even among flat creationists, not every theory requires that Man's creation was accomplished 6,000 years ago. I have seen dates pushing back between 10,000 and 25,000 years. (I've found several of the arguments for the principle behind a combination of this and f. rather ingenious, though I do not officially advocate this set of positions, yet. I think some bugs still need to be worked out.)

h.) I agree that, barring how we interpret Scripture (including our estimate of what it means for Scripture to be 'inspired'), there are no solidly authenticated grounds for advocating any of several degrees of literal Genesis interpretation. (Note: I say 'solidly' authenticated, because I do recognize one or two clever arguments on limited points as having merit; but as far as I'm concerned the jury is still out on how much to make of these points.) On the other hand, I'm not sure what sort of _positive_ evidence would be left by such an event (or events) along those lines, so this is not necessarily as much of a problem as Mr. Dawkins implies. After all, the actual _positive evidence for_ evolutionary development presented in TBW doesn't seem very substantial to me either, once I've kept track of exactly how Mr. Dawkins' argument progresses!

Obviously, someone who holds Scripture's inspired character will put more weight on it than Mr. Dawkins does; but Scripture's inspiration and the various degrees of it are rather complex subjects dependant on a number of other complex subjects--so for this particular purpose I am leery of putting much weight on 'inspiration'. I think absolutely _everyone_ will agree, from Mr. Dawkins to the most ultrafundamental creationist, that the positive confirmation claim (in an extremely literal sense) from this part of Scripture does not begin to match, say, the plethora of accurate socio-political details of 1st-century Mediterranea recorded by the author of Luke and Acts. The claim of St. Luke's 'inspiration', with regard to confirmable details, puts its money where his mouth is. I bring this up mainly so that my allies can understand that Mr. Dawkins is not, in general, acting irresponsibly by

wanting some solid confirmational evidence before accepting
a particularly literal interpretation of the first chapters
of Genesis. After all, most of my allies apply _precisely_
this line of reasoning when disputing the purported
inspiration of, for instance, the specifically Mormon
texts. I think we should agree that the principle, as such,
is a sound one.

i.) Be that as it may, assuming for the moment a defense of
total creation 6,000 years in our past, I find Mr. Dawkins'
list of incompatibilies to be uneven in strength.

i1.) I would (and do) accept the refutational evidence
provided by cosmological observation, up to a point. That
is, I acknowledge that it is metaphysically possible for
God to have set up our universe _such that_ lightspeed
observation of galactic entities was a going concern. (In
other words, at the moment He said 'Go!', He had strung the
appropriate streams of photons from the appropriate
cosmological entities to Earth so that these entities would
be visible.) However, such a metaphysical possibility, by
its character, entails nonconfirmability. There's no way to
tell _whether_ this is true, and I think an appeal to the
Bible for support will falter on the range of potentially
valid interpretations that would be acceptable even in
orthodoxy. (I don't mean to imply that there is an infinite
range of such potentially valid interpretations; only that
at the moment I see no overwhelming reason to choose from
among the limited selection available.) My understanding of
Christian metaphysics, soteriology (that's the study of
redemption and/or salvation), ethics and history has
vitually no bearing on this issue. Keeping in mind, then, a
similarly cautious understanding of the limits of
cosmological dating, I'm just as willing to accept a 10
billion-year-old universe as a 6,000; whichever way the
data seems to point best.

Speaking of the limits of cosmological observation, modern
cosmology may acknowledge the existence of "100,000 million
other galaxies", but I don't think this has been confirmed
by observation. More properly, the existence of this number
of galaxies is not improbable under modern cosmological
theory, and their proposed existence may help
speculatively to account for some cosmological data at
second-hand. I myself see no reason that there could not be
(and are not) hundreds of thousands of millions of
galaxies; but that's not the same as asserting their

definite existence. Strictly speaking, science can only assert the definite existence of entities we can definitely detect (the history of the study of black holes, or the Oort Cloud, or the outermost planet of our solar-system are perfect examples of this.) It's easy to slip into bald statements of fact out of solid (and even sometimes rather speculative) _theory_, even in science.

i3.) I'm ready in principle to accept radiometric dating, but I wonder about the application of the homogeonous diffusion assumption--that is, it seems to require a rather unnaturally even spread of radioactive-to-inert isotopes, across widely divergent times, climates, geographic and ecological zones, as a baseline for making these judgments. Perhaps there is some principle involved that offsets the counter-intuitiveness of this concept; however, it would make me more than a little leery of using long-range radiometric dating.

i4.) The geology issue has some strong points in favor of Very Old Earth positions, even insofar as early-emergence of animals is concerned. As far as biological evolutionary theory is concerned, I agree that geology helps out the theory to some degree. But then, some of its 'assitance' requires that long-range radiometric dating be reliable (see above); and in TBW, at least, some of its purported assistance of biological evolutionary theory requires full-blown evolutionary theory as a given _premise_ for interpreting the conclusions, which limits its use in arguing _for_ biological evolution.

i5.) On the other hand, I've seen nothing presented in TBW that lends credence to Very Old Earth (or Universe) theories from "orthodox biology"; so the fact that Young Earth (or Universe) Theories are incompatible with it doesn't mean much. Think about it: how exactly, in principle, would Terran _biology_ argue for any _universal_ dating above and beyond the Earth's own age? The most it could hope to accomplish would be to establish that the universe is _at least as old_ as the Earth. And how does "orthodox biology" help establish the Earth's age? From the fossil record? But that depends on the _geology_; as Mr. Dawkins himself pointed out, when people were ignorant of what the geology implied, they were ignorant of the dating we now ascribe to the fossils. From the vast amount of time necessary for evolutionary theory to have 'designed' creatures as complicated as us? This is vicious

circularity: it requires evolutionary theory to be true, yet evolutionary theory itself requires Very Old Earth theories to be true. "Orthodox biology" is incompatible with Young Earth (or Universe) theories mainly as a secondary effect, as a rider on other conclusions from other observations. (Note: To be fair, Mr. Dawkins doesn't claim here that "orthodox" biology lends credence to Old Earth Theories; he only notes that the two sets of theory are incompatible. However, since the other three branches of science mentioned _do_ have some positive arguments for Old Earth Theories, I didn't want you, the reader, to be misinformed by mere grammatic proximity.)

Hmmm... something just occurred to me. Remember back near the top of this same page of TBW (p 293) when Mr. Dawkins was discussing the Loch Ness Monster? He noted that the creature's existence (assuming it was a clutch of plesiosaurs, or something of that sort) would not be incompatible with his "world view" (by which he seems to mean both the biology of evolution and the philosophy of evolutionism). A paragraph later, we see him discussing and promoting another set of positions (Very Old Earth and/or Universe Theories) which I think we'd all agree are certainly not incompatible with his "world view". And on the previous page (292), he briefly discusses fairies, the existence of which (given their traditional supernatural character) I think would be fairly described as anathema not only to philosophical naturalism but probably to biological evolution and philosophical evolutionism as well. (Trying to account for them by either method would probably be, shall we say, an exercise in incompatibility.) He doesn't exactly discuss what sort of evidence he'd accept for the existence of fairies, but he heavily implies that he'd have to see one for himself before he even got close to believing they exist. Well, that's a common (and relatively commonsensical) approach to take with respect to something, the existence of which would be contradictory to the foundational principles of reality he accepts. But what about a living plesiosaur? That wouldn't contradict any principles of his. It would simply be (as he says) a question of fact. What sort of evidence would he be willing to accept for it? The only category he mentions is the same as what he heavily implies concerning the fairies: 'the evidence of his own eyes'.

Isn't that odd? After all, he seems to accept the existence of "100,000 million galaxies", yet neither he nor anyone

else can possibly have seen them. He accepts an ancient age
for the universe and the earth, yet the evidence for this
is hardly tactile. He accepts the existence of the
evolutionary process, yet as he himself seems to admit in
TBW, no one has ever _seen_ it working. He positively
advocates the non-existence of God (which means even more
than saying 'I will believe in Him when I see Him'); yet
the very character of this claim excludes the possibility
that he could verify it in such an immediate way as seeing
a plesiosaur with his own eyes. Presumably he accepts all
these positions because it's possible to argue abstractly
from the implications of other evidence (or, in the case of
God's non-existence, purely from the implications of
abstract argument!) to the conclusions he advocates; the
other evidence being such that at face-value it says
nothing about the universe's age, or evolutionary process,
etc.

I'm not exactly sure what to make of this; but it seems
like some sort of hidden double-standard is at work here.
Perhaps I'm only being naive, but I have no problem
believing in a currently living coelacanth despite the fact
that I've never actually seen one (I've seen some pictures,
of course, but we all know that photos can be faked.) I
guess I believe in the existence of live coelacanths thanks
to a converging net of otherwise circumstantial evidence;
including Mr. Dawkins' own expert testimony (for however
much that's worth.) I would certainly be delighted to see,
with my own eyes, a living plesiosaur; but I could imagine
in principle some other methods by which I might be
convinced of its existence. Ditto the fairies, come to
think of it!

I'm bringing this up because religious sceptics often
employ an arbitrarily truncated standard of belief-criteria
on certain topics; yet accept a level of evidence and
argumentation in other arenas which approximates the
quality of scholar-level apologetics (both metaphysical and
historical). I'm not sure there's anything that can be done
about this; but you, the reader, might at least find it
interesting and self-instructive to reflect on the various
qualities of belief-criteria which you employ, and _why_
you've chosen to do so. Are you _quite_ sure you are
allowing a fair standard of criteria for the acceptance or
rejection of particular propositions? Application of fair
standards won't come automatically, or even stay

automatically; it requires a certain amount of active upkeep.

(Let me add that I mean this to apply equally well to my fellow believer as well as to my sceptical reader. We often challenge sceptics to put their beliefs to a harshly fair, uncompromising test; when we ourselves, brought up from childhood as Christians, have never given five minutes serious thought to the question of whether we ourselves are making clear and fair judgments of the data. Furthermore, a lack of stringent discipline in checking our own beliefs leads to the propagation and acceptance of heresies. We may trust in God and Christ that we need not get everything right; I remember no promise from Him that we need not try our best.)

p 293, "[W]e naturally, and rightly, demand a higher standard of authentication before accepting a fact that would turn a major and successful scientific edifice upside down, than before accepting a fact which, even if surprising, is readily accomodated by existing science."

I agree completely with this, as far as it goes; but I do not share two of the key (hidden) propositions behind this statement: that 'science' forms the real 'edifice' of our valid beliefs, and that the vast interlocked reaction and counterreaction set of physical material (including matter and energy) which we call Nature is necessarily the final and ultimate reality. The process of 'science' depends on the formal application of (otherwise) abstract logic--and that means science necessarily relies on philosophy. (This can be confirmed by studying the historical contexts of the development of science.) And, of course, I happen to think there are good reasons for (at the very least) suspecting the existence of a supernature; some of which I've presented throughout SMB. I don't mean to say that both of these considerations combine to completely undercut the authority of scientific study and conclusion; but they do put something of a limit on how far that authority extends. This can be illustrated by the next part of Mr. Dawkins' paragraph, same page:

"If I saw a man levitating himself, before rejecting the whole of physics I would suspect that I was the victim of a hallucination or conjuring trick."

Now, I certainly agree that, before I rejected the whole of physics, I would suspect hallucination or trickery-- assuming those were the only two possible options. But, as I've argued earlier in SMB, a man _actually_ levitating himself would not entail anything like "rejecting the whole of physics". It might (barring trickery, of course) very well mean rejecting the concept that physics are the whole of everything, but that's a completely different proposition! This is not an either/or situation: it is entirely possible and coherent to propose that physics are not the whole of everything (i.e., that naturalism is false) while at the same time accepting physics as a whole. It is a logical fallacy to maintain that the recognition of System A as a subsystem requires the outright rejection of System A _as_ a system.

You should be able to see, though, why a naturalist would be tempted to advocate this sort of false requirement: given a choice between 'all' or 'nothing', and given that we obviously know 'something', the only logical choice would be to accept 'all'. I deny that the choice is between all or nothing; I say that it is technically possible for 'something' to equal 'something' and not 'everything'. Any given part is not necessarily the sum of the whole. (The supernaturalist would still, of course, have to establish that the something is not everything. But denying that technical possibility before the discussion even gets going is, to speak bluntly, cheating.)

Mr. Dawkins brings up the concept of 'successfulness' several times, as a sort of yardstick to how we should interpret further data. For instance (p 293):

"[S]cience has amassed a good understanding of how the universe ticks, an understanding that works well for an enormous range of phenomena... [W]e naturally, and rightly, demand a higher degree of authentication before accepting a fact that would turn a major and successful scientific edifice upside down... There is a continuum, from theories that probably are not true but easily could be, to theories that could be true at the cost of overthrowing large edifices of successful orthodox science."

Nevertheless, what we now call 'orthodox' science was once not 'orthodox', and the prior theories (though perhaps not quite as successful as the newer theories seem to be) were nevertheless quite successful in their own right. Who could

have predicted the rise of heliocentrism--the belief that
the earth orbits the sun? It arose at a time when _all_
observations and measurements pointed the other direction.
Geocentrism 'worked', and worked very efficiently, given
the data we had at the time. Who could have predicted in
advance the discovery of a spherical Earth? Flat-earth
navigation and mapmaking 'worked' very efficiently and
successfully for a long time; almost all the available data
pointed to it. (If I recall correctly, we deduced it
eventually from the Earth's shadow on the moon, and from
the way islands seemed to rise out of the sea over the
horizon; long before we confirmed it experimentally.)
Newtonian physics seemed enshrined forever as the pinnacle
of natural study; it collapsed as we discovered wave
functions 'collapsing'.

Or did it? Here's another point; the real progresses in
science rarely, if ever, _overthrow_ the old theories
completely. Heliocentrism took over all the useful parts of
geocentrism (and there were plenty), and applied them in a
new direction. (The underlying philosophies behind both
sciences were far more different than the sciences
themselves.) Spherical circumnavigation added some new
twists (literally!) to the old flat-earth navigation
principles, but overthrew very few of them. Newtonian
physics still works just fine for almost every practical
purpose. Modern chemistry superficially 'looks' much
different from its medieval counterpart, but mainly it's
more effective at applying "woolly" old principles
discovered centuries ago. Modern mathematics, with its
imaginary square roots of negative numbers and non-
Euclidian geometries, still applies virtually everything
that came before. Biology, perhaps, has jumped and jinked
more sharply than other sciences; I suspect this is because
it still relies more than the other sciences on underlying
philosophies for interpreting its data.

I therefore suggest that recognition of 'success' does not
necessarily entail out and out scepticism of any other
position, before we check the data; and in the case of
biological evolutionary theory, I think Mr. Dawkins should
at least give us a better idea of exactly _how_
evolutionary theory has been 'successful'. What have we
actually accomplished with it that really _required_ it?
I'm asking this with a certain amount of ignorance; I
really want to know. I think it would make Mr. Dawkins' own
book a bit stronger to spell something like this out. The

main advantages to the biological theory (as I've gathered
from TBW, at any rate) seem to be: a.) the data requires
less shoehorning to fit into it, compared with other
theories (including, admittedly, flat creationism, as far
as I can tell); and b.) on the face of it the theory seems
to work given naturalistic philosophy--which is important
to proponents of naturalistic philosophy! I think I can
argue that, concerning its links to naturalistic
philosophy, biological evolutionary theory actually ends up
a liability rather than an asset; but I would consider
point a. to be an advantage of sorts. I myself doubt that
this is enough of an advantage to necessarily require
incredulous scepticism as a default for considering any
other option. Of course, by 'successful', Mr. Dawkins may
only mean 'It has been extremely successful at becoming
extremely prevalent in scientific circles, particularly
biology.' This might be a factor of any number of causes,
though; including a prior committment to an overriding
philosophy, which must be established and debated on its
own grounds. Efficiency at actually accomplishing something
may help explain its prevalence, but then we're back to
'accomplishing _what_, exactly?'

Mainly I want the reader to understand some of the
constraints involved in erecting any given scientific
system as an 'unum necessarium'. I don't think Mr. Dawkins
qualifies the caution we should have in such matters,
particularly with respect to dialogue with adherents of
other theories. It's one thing for me to stand on the Rock
and preach to the choir--we're all pretty much agreed on
how we stand on most matters, and aside from some minor
buffing and polishing and readjustment, we're mostly
content to feed on the truth. Even then, it only behooves
me not to set my audience up for trouble later on with
claims that are too grandiose; the warning about causing
the simple to stumble can be applied all sorts of ways!
When the time comes to dispute the matter formally, though,
I think I'm serving everyone's interests better if I (at
least in theory) ante up my own beliefs (the way I'm asking
my opponent to do) rather than set up a fortress mentality.
An M1A2 battle tank is pretty tough to crack, whether it's
in a fortress or not; so I might as well send it on to the
battlefield. That's one way I verify it's a tank, and not
the tricycle I rode as a kid.

My discussion of the first part of p 293 has been a rather
dense one, relative to the material actually covered; but I

needed to get some things in perspective before we
continued on to Mr. Dawkins' discussion of Lamarckism and
embryology. So, for instance:

p 293, "I want to make a case that, while not in the same
class as levitation by the power of prayer, Lamarckism, or
more specifically the inheritance of acquired
characteristics, is closer to the 'levitation' end of the
continuum than to the 'Loch Ness monster' end."

I consider this an example of the fundamental
misidentification between improbable (or implausible)
natural events and supernatural events which has haunted
Mr. Dawkins' discussion of the matter throughout TBW--and
which, as we saw back on p 288, he apparently intends to
rely on later in this chapter to 'doom' creationism as a
live option. Lamarckism is certainly not in the same class
as levitation by the power of prayer; but not for the
reasons Mr. Dawkins gives. More precisely, levitation by
the power of prayer is the odd-man out here; qualitatively,
it bears no intrinsic resemblance as a proposition to
Lamarckism or the Loch Ness Monster. Levitation by the
power of, say, an unknown element more dense than anything
we've yet come up with, fused into a ring and affecting us
by radiation (i.e., the flight rings of DC Comics' old
Legion of Superheroes series) would be a better example.
This would be principly the same _type_ of claim as
Lamarckism, or the Loch Ness Monster, or even biological
evolutionary theory: a purportedly scientific claim made
about the natural behavior of materials found in nature on
other natural entities. In other words, a flight ring with
radioactive levitation powers is _not_ one of those things
that easily could be true but probably isn't--and we can be
sure of this thanks to the very grounds by which its
proponents would wish us to judge it (the laws of nature).
What we know (or at least think we know) about the laws of
nature so far, _does_ provide strong grounds against
levitation from the radiation of a previously unknown
natural (or even synthetic) element. This is comparing
apples to apples.

And now we are ready to deal, on its own terms, with the
question:

p 294, "What, then, is this widely accepted and succesful
embryological principle that would have to be overthrown
before Lamarckism could be accepted? [...] And remember

that this is all before we start the argument that
Lamarckism, even if it _were_ true, would still be
incapable of explaining the evolution of adaptive
complexity." [italics his]

To explain why embryology doesn't back Lamarckism (even
aside from the question of what Lamarckism itself could
accomplish as far as development), Mr. Dawkins takes the
time to give us a very interesting history of the study of
embryology--bringing us up to speed, if we happen not to be
familiar with these ideas.

One theory is preformation, and it has ancient and modern
variations. The ancient preformation theory suggested that
a tiny underdeveloped body (but otherwise complete, like a
baby) existed in either the sperm or the egg of all given
species. (Mr. Dawkins uses humans as the example species
here, and I'll follow his lead.) Obviously, you couldn't
have two bodies merging from sperm _and_ egg, so the theory
(of whichever variation) ran into the problem that
characteristics of _both_ parents--and/or characteristics
of both parents' own immediate ancestors--tended to be
passed on to the children. Also, there was the problem of
infinite regress (which, by the way, haunts some
philosophical propositions, too): it requires that the
baby's sperm (or egg) also contain ultrasmall babies, whose
sperm (or egg) also contains ultra-ultrasmall babies, etc.,
ad infinitum. For what it's worth, (and contrary to Mr.
Dawkins' implication) I think that given a philosophy where
nature is infinite and everything is nature, this might
actually be feasible in principle; but we've experimentally
discovered, of course, that this isn't how it works. The
parts of sperm or egg which comprise a human can be reduced
to elements which are not themselves not little humans. And
this leads us to modern preformation theories.

Mr. Dawkins uses a very good example of how the description
of a house may be reduced to two-dimensional sets (like a
blueprint) or one-dimensional sets (binary electrical
impulses--the impulses themselves occupy 3-D space, of
course, but he's thinking in terms of how the information
is stored or communicated.) Granted, such reductions as
_we_ make tend to leave out information which cannot be
intrinsically restored by re-inflating the information as
such--reducing a house to a series of 2-D line drawings
will probably obliterate, say, the color of the
windowshades which must be reproduced by a separate method-

-but in principle (barring quantum indeterminancy, of course) we could one day perfectly reduce information about the states of a given house, or birthday cake, to a one-dimensional stream of impulses. This scan and save method of reproduction, in fact, seems to be the principle behind science-fiction devices like the transporters from _Star Trek_ and the various permutations/sequels of the movie _The Fly_. As Mr. Dawkins noted earlier, the arrangement and composition of DNA lends itself to encoding information in this kind of general format; and so a modern preformationist would say that the DNA strand is a point-for-point representation of a human body in genetic code.

p 295, "This [point-for-point representation of a human body in genetic code] doesn't happen but, if it did, it would be fair to say that modern molecular biology had vindicated the ancient theory of preformationism."

Of course, modern molecular biologists have an understanding of heat requirements in chemical reactions, electrical requirements for structure and transmission, and the use of key gases in organic chemistry; and this understanding stands approximately to the ancient theories about fire, warm breath and sparks of life as modern genetic point-for-point data compression would have stood to ultraminiature 'homunculi'. Yet I noticed back on p 112 that when it comes to _actual_ discoveries and their parallels with ancient theories, Mr. Dawkins was willing to grant much less credit.

So much for what preformation theory's about. The other "great theory of embryology" is known as epigenesis; or, as Mr. Dawkins aptly calls it, the recipe theory.

The recipe for the cassarole I made the other night (or the currant and crumb cake Mr. Dawkins uses) is not a point-for-point description of what that food is; but instructions for how to make the food--materials to use and procedures to follow. But the genetic information is even more complicated than that; it's more like what would happen if I gave 50 copies of the same cookbook to 50 people in my church and asked them to contribute 52 weeks of after-service lunches from recipes in the cookbook. Each week we'd have a certain number of ladies (nothing against the guys in our church, but as it happens most of us can't cook very well and we know it) in the kitchen, each of them using some common ingredients (eggs, flour, water); each of

them using some unique ones (chicken gizzards, perhaps!);
each of them using the same cookbook; some of them using
the same recipes sometimes (but never the same day, of
course); all of them using the same language with the same
alphabet and gramamtic rules. On different days, different
parts of the cookbook would be used to make the meal (not
every part every Sunday); and the ingredients could either
be the same or different, but not in any necessarily
binding overarching sense.

Similarly, all the cells in my body (barring a few
specialized ones like red blood cells) hold the same
genetic information; but what each individual cell does
depends on which part of the genetic code inside that cell
is turned on or off. As Mr. Dawkins says,

p 296, "Precisely which genes are switched on in any one
cell at any one time depends on chemical conditions in that
cell. This, in turn, depends on past conditions in that
part of the embryo."

Note that this would be true under normal conditions even
if God exists and acts in nature; and even if He were to
occasionally alter the process directly, He would not
thereby be completely overthrowing the general rule. (This
is my clarification, not Mr. Dawkins'.) Moreover, as Mr.
Dawkins notes, a gene turned on at the base of the spinal
cord in the third week produces a cell with a totally
different relationship to the body if the same gene is
turned on in the shoulder during the seventeenth week.
This, as he says, is what "makes nonsense of the idea that
the genes are anything like a blueprint for a body."

Although this complicates the life of the geneticist, it
doesn't undercut her task at discovering single-gene
effects. It only means that the factor of time and position
must be taken into account along with everything else. As
Mr. Dawkins notes (and I thought this illustration a
particularly good one):

p 297, "'Baking-powder does not correspond to any
particular part of the [finished] cake: its influence
affects the rising, and hence the final shape, of the whole
cake. If 'baking-powder' is deleted, or replaced with
'flour', the cake will not rise. If it is replaced by
'yeast', the cake will rise but will taste more like bread.
There will be a reliable, identifiable difference between

cakes baked according to the original version and the
'mutated' versions of the recipe; even though there is no
particular 'bit' of any cake that corresponds to the words
in question. [...] To simulate the 'baking' of a baby, we
should imagine not a single process in a single oven, but a
tangle of conveyor belts, passing different parts of the
dish through 10 million different miniaturized ovens, in
series and in parallel, each oven bringing out a different
combination of flavours from 10,000 basic ingredients."

Now, on page 298, Mr. Dawkins says that if preformation
were true:

"If the genes were a blueprint, it would be easy to imagine
any characteristic that a body acquired during its lifetime
being faithfully transcribed back into the genetic code,
and hence passed into the next generation."

Mr. Dawkins' refutal of this, later on this page, is
essentially, "But the genes are not a blueprint." Although
I agree with him, this would seem to be a place for
demonstrating _how_ we know they aren't 'blueprints' per
se. Ironically, I found a rather concise and useful summary
of how we know this, in that book by Pearcey and Thaxton I
referenced a little while back (pp 222-228, with a helpful
diagram of proteins and DNA, if you'd like to look it up.)
I thought he might even refer to something basic like, 'We
don't actually find callouses in the right places on the
newborn babies of a line of blacksmiths'. (That is, the
evidences for something as supposedly basic as acquired
characteristics seem few and far between). I even thought
he might point out that no one, to my knowledge, has
managed to come up with a workable mechanism whereby the
acquired characteristics of each parent is scanned back
into either every gene, or the genes we find in sperm and
eggs. (That is, _I_ at least don't find it particularly
"easy to imagine" any acquired characteristic "being
faithfully transcribed back into the genetic code".) His
argument (to this point) against Lamarckism boils down to
the following positions:

a.) All attempts to demonstrate the effect have simply
failed. (Note: as far as I can tell, he doesn't mean that
attempts to replicate the underlying genetic writing
process has failed--he means that experiments where these
processes might at least be assumed have failed.) So have
attempts at generating life in a lab, for that matter; I

wonder what the relative probability comparison between the two would be? (Maybe it's just as well he hasn't tried to tell us, all things considered!) However, he gives no examples of particular attempts and their faulty methodologies (or even their proper methodologies despite which they failed), aside from a brief remark about some frog of Arthur Koestler's which I can hardly presume the general reader will be very familiar with in detail.

b.) Acquired characteristics wouldn't work for recipe genes, only for blueprint genes. Therefore, acquired characteristics must use blueprint genes. However, there are no blueprint genetic structures in Terran embryology. We know this because... <crickets chirping from Mr. Dawkins' direction> ...because Mr. Dawkins says so, as far as we readers are supposed to be concerned, I guess. I keep going over the last few pages, looking for something other than implied and explicit assertions that blueprint coding is false because blueprint coding is false. This is a situation where we're being asked to trust Mr. Dawkins for all practical purposes as sole authority; and while I have no particular inclination to dispute him on this, I also find it hard to work up much confidence in him, either. And either way, we're still looking at a circular extension of a flat assertion: he would have told us just as much had he stopped with the statement 'There is no such thing as blueprint genetics.' I suppose I shouldn't be too surprised at the lack of more grounding than this; but maybe his next stage of refuting Lamarckism will be better. He certainly seems to think it will be, considering what it's supposed to accomplish (and at this stage, I hope it does for his sake):

p 299, "All that I have shown so far is that Lamarckism is incompatible with embryology as we know it. My claim at the outset of this chapter was stronger: that, even if acquired characteristics _could_ be inherited, the Lamarckian theory would still be incapable of explaining adaptive evolution. This claim is so strong that it is intended to apply to all life-forms, everywhere in the universe. [Sidenote: to paraphrase Mark Twain, _That's_ a sufficiently broad statement!] It is based upon two lines of reasoning, one concerned with difficulties over the principle of use and disuse, the other with further problems with the inheritance of acquired characteristics."

He discusses the further problems of acquired
characteristics first, and as far as I can tell, he
actually makes good (for once!) on his far-reaching agenda.
The argument is a clever development of the principles of
Lamarckism itself, though he may go a bit too far
analogically in his attempt to illustrate that Lamarckian
development would result in more and more decrepit species.
Specifically...

p 299, "Obviously evolution is not going to proceed in the
general direction of adaptive improvement if acquired
characteristics are inherited indiscriminately: broken legs
and smallpox scars being passed down the generations just
as much as hardened feet and suntanned skin."

So far, so good; and we do not in fact find those sorts of
things, for what it's worth. But I think he stumbles a bit
in the following analogy:

p 299, "Most of the characteristics that any machine
acquires as it gets older tend to be the accumulated
ravages of time: it wears out. If they were gathered up by
some kind of scanning process and fed into the blueprint
for the next generation, successive generations would get
more and more decrepit."

This seems to ignore the basic fact (which I would suppose
as a zoologist, Mr. Dawkins would be far more aware of even
than I am) that most successful matings and childbirths
occur when the parents are still more-or-less in their
physical prime. Otherwise, the mother dies in labor, or
either (or both) of the potential mates gets outfought for
the chance to reproduce, or something of that sort happens.
Granted, you could expect _some_ wear and tear on the
animal; and maybe what Mr. Dawkins means here is only that
in an _ongoing process_ of this sort, the tally would
quickly (geologically speaking) pile up. Even so, that
doesn't seem to be exactly what his analogy is referring
to. Some clarity or revision here might make his point
better.

Mr. Dawkins admits that it's theoretically possible to
imagine some sort of underlying process or principle that
ensures that _beneficial_ acquired characteristics get
passed along to future generations more efficiently than
the _deleterious_ characteristics. Mr. Dawkins' rather
clever reply to this is that such a process is, in fact, in

place to accomplish this--and it's Darwinian biological evolution! In fact, Darwinism provides just the process necessary for those few agreed-upon positive adaptive characteristics to have actually occurred (callouses on the feet, etc.)

p 300, "In other words, the Lamarckian theory can explain adaptive improvement in evolution only by, as it were, riding on the back of Darwinian theory. Given that Darwinian selection is there in the background, to ensure that some acquired characteristics are advantageous, and to provide a mechanism for discriminating the advantageous from the disadvantageous acquisitions, the inheritance of acquired characteristics might, conceivably, lead to some evolutionary improvement. But the _improvement_, such as it is, is all due to the Darwinian underpinning. We are forced back to Darwinism to explain the adaptive aspect of evolution."

Very clever. Of course, depending on how attentive you've been, you'll probably recognize that my appreciation of this maneuver resembles my appreciation of a similar maneuver I've been inflicting on Mr. Dawkins all book-long: that the actual implications of biological evolutionary theory could only result in creatures like Mr. Dawkins and you and I (who all assume we have potentially valid reasoning and moral capability, and who all generally speak as if humanity were in some basic sense separate from natural process) _if_ the God of Judeo-Christian theism (and, I presume, Islam as well) exists.

Wait... what's this? Can it be? Finally, after 300 pages, he's going to discuss 'learning' and 'evolutionary progress' in the same paragraph? Should I be afraid? Let's see what he proposes here...

The first thing I notice is that Mr. Dawkins isn't really concerned (at this point) with explaining 'learning' evolutionistically. He's only bringing it up now, in these two paragraphs, for a limited purpose; to offer another example of how Darwinism beats Lamarckism at offering an explanation for a class of acquired improvements. But in doing so, we see once more the 6=16 paradigm being brought into play to smooth over qualitative difficulties. Let's see how he plays fast and loose with the concept of learning in the next two paragraphs, spanning pages 300-301:

p 300, "During the course of its life, an animal becomes more skilled at the business of making its living."

As you can see, Mr. Dawkins starts by offering a description of the animal's behavior which we know from previous discussions in TBW he _must_ be counting as a 'mere metaphor'. We must remember that, as far as Mr. Dawkins is concerned, the animal is purely an automatic, unconscious biological machine. What he should be writing here is something like, 'During the course of its life, an animal becames more efficient at reacting to its environment in a survivable fashion.' What's the harm of keeping the fence-straddling metaphorical language here, you ask? Look at the next two sentences:

p 300, "The animal **learns** what is good for it and what is not. Its brain stores a large library of memories about its world, and about which **actions** tend to lead to desirable consequences and which to undesireable consequences." [italics mine]

The fence-straddling metaphor of "becoming more **skilled* at the **business** of **making its living**" has opened the door for Mr. Dawkins to treat the animal as if it were _NOT_ an unconscious, automatic entity: now it can initiate _actions_. And he completes the bridge of this gap merely by applying the term "learns", so that you and I will equate (thanks to the magic of English grammar) the blind, automatic, non-purposive, unconscious reactions of an animal (say, an echolocationistic bat) with the sort of active cognition we not only recognize in ourselves but _require_ to exist in our own lives for arguments to get going. There have been many example of the 6=16 shuffle in TBW, but this is one of the purest.

And it's a throwaway! He makes the switch as a matter of course, not even worth a chapter of discussion, purely so that he can agree that:

p 300, "If parents could somehow transcribe the wisdom of a lifetime's experience into their genes, so that their offspring were born with a library of vicarious experience built-in and ready to be drawn upon, those offspring could begin life one jump ahead."

Which, in some cases, is the sort of thing the Lamarckists
(whom he's arguing against here) propose. What he _doesn't_
tell you here is that Lamarckists are trying to account for
instincts, not reason, by this method--for example, how
birds are born capable of spherical navigation and
nestbuilding (once they've grown, of course.) The
Larmarckist would say that earlier ancestors had either
actively discovered this and biological mechanisms had
passed this knowledge genetically to their descendents; or
that (properly regarding the vast majority of animals as
biological machines) earlier ancestors had had sensory
experiences, both positive and negative, connected with
successful survival, that somehow were encoded via neural
reactions not only into the brain (where other sensory
impulses might reactivate the proper reactions in that
individual later) but into the genetics. And unless the
experiment has been disproved somehow (Mr. Dawkins hasn't
brought it up yet), the Lamarckists have at least one
interesting bit of evidence to back this up: a flatworm
which successfully navigates a maze can be ground up and
fed to another flatworm, which then can somehow navigate
the maze successfully from a blind start.

Now, for Mr. Dawkins to accomplish his immediate task of
arguing (as he did fairly effectively earlier on p 300)
that the existence of such instinctual behaviours "forces
[us] back to Darwinism to explain the adaptive aspect of
evolution", he's going to have to produce a Darwinian
explanation that is different from _and_ better than the
Lamarckian explanation. But remember, as we continue onto
the top of p 300, he has sort of whiffled past the actual
Lamarckian contention (existence of wired-in instinct) and
seems (on the face of it) to be discussing actual learning
(except that it must actually be something other than
active learning.) So what is his refutal process example?

p 300, "Animals do, as a matter of fact, learn to do what
is good for them, rather than what is bad for them, but
why?"

Slurring the learning part again, we see.

p 300, "Animals tend to avoid **actions** that have, in the
past, led to pain." [italics mine]

And continuing to slur the meaning of 'action', we see.

p 300, "But pain is not a substance. Pain is just what the brain treats as pain. It is a fortunate fact that those occurrences that are treated as painful, for instance violent puncturing of the body surface, also happen to be those occurrences that tend to endanger the animal's survival. But we **could easily** imagine a race of animals that _enjoyed_ injury and other occurrences endangering their survival; a race of animals whose brain was so constructed that it took pleasure in injury and felt as painful those stimuli, such as the taste of nutritious food, which augur well for their survival." [italics mine]

But, on the Lamarckian scheme, I myself cannot imagine a race of animals existing in that fashion. Mr. Dawkins 'refutes' his opponents here using the same general methodology by which he's been 'refuting' creationism throughout the book: by flatly misrepresenting the implications of his opponents' stated positions and presenting as 'possible' circumstances, conditions which are not considered possible under his opponents' theories. Ask yourself this: _WHY_ could we "easily imagine" such a race of animals? The Lamarckians aren't saltationists; as far as underlying general processes go, they're as gradualistic as the Darwinians. They also believe in cumulative micro-step development of animal species in response to the interaction of individuals with their environment. Mr. Dawkins' own descriptions of their theory, stretching back to the bottom of page 288, makes this abundantly, perfectly, crystal-clear. He even specifically notes that Lamarckism has the _advantage_ of being a cumulative process on p 291! Why, after 13 pages of in-depth discussion about the process features of Lamarckism, does Mr. Dawkins expect us _now_ to suddenly ignore all that and pretend that under Lamarckism something like an entire masochistic species _could_ possibly come into being? Because, dear reader, _THIS IS HOW HE WORKS_!! He relies on you and I being incapable of following the implications of a train of thought from one page to the next. His whole methodology is steeped to the gills in this strategy. As far as I can tell from TBW, his awards and laudations and ovations and applause don't reflect the excellence of his ability or arguments, but the sad state of modern analytical thinking. From a fairly well-thought out rebuttal to Lamarckism in the first paragraph of page 300, he turns immediately to the following statement, which works only by bluntly suppressing the voice of the opposition crying 'Us, too!'

p 301, "The reason we do not in fact see such masochistic animals in the world is the Darwinian reason that masochistic ancestors, for obvious reasons, would not have survived to leave descendants that inherited their masochism."

Or the Lamarckian, or even creationistic, reason that masochistic ancestors would not have survived to leave descendants that inherited their masochism (provided that sort of thing could happen.) Yet somehow, despite the fact that there is _no distinction_ between the three types of theory on this score (and this is even ignoring, for the moment, the concept of theistic evolutionism)...

p 301, "We have again arrived at the conclusion," claims Mr. Dawkins, "that there must be a Darwinian underpinning to ensure that acquired characteristics are advantageous."

Since Mr. Dawkins is now about to leave in limbo the issue of "the changes that we call learning" (p 301), let me speculate for a moment about why Mr. Dawkins, after arguing fairly well against Lamarckism earlier on p 300, should include immediately afterwards this tissue tossed over our heads while we (presumably) aren't paying attention, as an excuse for an 'argument'. He's obviously capable of stringing together a useful argument. Why didn't he improve this one, or leave it out altogether?

I'm only speculating here, but I have to wonder if these two paragraphs are really a smokescreen. What did I say earlier? That he starts this particular rebuttle attempt by presenting a progressive slur between unconscious reaction and conscious action. By bridging them with the 6=16 paradigm, and discussing 'learning' behavior as if that case were closed in a throwaway fashion, he could be sidestepping the issue that I've been bringing up in one form or another throughout my book: that the principles themselves of biological evolutionary theory do not provide us a working system that allows conscious, active thought-- the sort of thought necessary to develop and defend biological evolutionary theory itself. An ocean of ink has been spilled by evolutionists and evolutionismists (the proponents of the science and the philosophy respectively, though the same person may of course be both) trying to deal with this problem.

The mere proponent of evolution (the biological theory) has less of a problem with this, because she's only working with a scientific theory and is interested in discovering the limits as well as the expanse of its coverage. If that's how the data and the principles come out, then that's how they come out. Revise the principles, recheck the data, or meanwhile apply to a supervening philosophy which logically provides the missing piece if necessary; she's flexible because she can afford to be. But the proponent of evolutionism (the philosophy) doesn't have this luxury. He needs the results to fit his supervening philosophy. He knows full well that the philosophical opposition makes certain claims about our relationship to physical reality. He may not understand the claims, or even have thought about them particularly deeply, and he may in all fairness be able to see some correctives to the opposition; but he knows they're there. For him, biological evolutionary theory is a weapon in the philosophical war; it gives him a plausible option. The evolutionismist is a naturalist. He believes (or wants to believe) that the automatic, reactive, nonpurposive, nonrational, nonmoral physical universe is everything; that there is no God. And that means he's restricted to accounting for absolutely _EVERYTHING_ via natural process. If certain entities seem well-designed, they can only _seem_ well-designed--it must be an illusion, because there is no designer. The watchmaker is blind. So he looks for a process which can explain these facts. Biological evolutionary process seems to fit the bill admirably--at least, at first it does. But it has to continue fitting the bill. And (to be fair) nothing better has come along since for the naturalists; that's why almost all naturalists who know anything about biological evolutionary theory are evolutionismists. If biological evolutionary theory doesn't cover _EVERYTHING_ about humans and human behaviours, then they're up a creek. They can't just take a neutral outlook about the science. I often see an 'all-or-nothing' approach to evolutionary science from them, and I think we've seen it again from Mr. Dawkins at earlier spots in the book (most recently on page 293, this chapter). They've bet the house--I believe at least some of them have literally bet their souls--on whether that pigskin clears the uprights or not. The mere proponent of biological evolutionary theory knows that, win or lose, the game itself still goes on, and there are things more important than the game. The mere fan will be annoyed if the ball doesn't clear the goalposts, but also knows it isn't the end of the world. The man who just bet

his house and soul has a different perspective. And it doesn't take much imagination to figure out what sort of actions that fellow will take (if he can) to ensure that everyone believes the goal is good. What sort of tactics and strategies have we seen from Mr. Dawkins in TBW? What sort of tactics and strategies have we just seen him apply to the _Lamarckists_, even??

Mr. Dawkins now turns to a further discussion of the principle of use-and-disuse in Lamarckism, where I think he makes some fairly good points; actually, I think he makes better points than he seems to realize!

His error here stems once more from his peculiar strategy of drastically restating the opposition in ways which not only force their claims to look silly (that might be a legitimate result from a reduction to principles), but which they themselves aren't really at bottom claiming. In this case, he rephrases the principle of use-disuse like so:

p 301, "The rule says simply, 'Any bit of the body that is frequently used should grow larger; any bit that is not used should become smaller or even wither away altogether'."

But this isn't quite what a Lamarckist would claim (or at least it seems to me.) She would probably say that any bit of the body that is frequently used should grow _more efficient_. That might mean larger, but I can think of several instances where it doesn't necessarily mean that. My muscles didn't get significantly larger when I learned to swordfight (though they did get a little larger.) What mainly happened was that the links between muscles, tendons, ligaments, bones and nerves in my arms and body (including certain neural clusters in my brain) became more efficient in terms of reflex. A gunfighter's hands and arms become faster and steadier. All these improvements put together could be represented in a fighter pilot. The increase in efficiency in cases like this, though perhaps attended by a not-completely-inconsequential increase in a body-part's size, is _disproportionately_ more effective compared to increase of that size.

Furthermore, there doesn't seem to be any need to reduce use-and-disuse to a mere size change. As Mr. Dawkins himself points out (introduced, by the way, with what

ironically seems to be a variation of the Argument from
Design methodology!), the sort of things that happen to the
human eye during an individual's natural life don't tend to
make it _better_ during that lifetime:

p 302, "The lens [for instance] is transparent and
corrected against spherical and chromatic aberration. Could
this have come about through sheer _use_? Can a lens be
washed clear by the volume of photons that pour through it?
Will it become a better lens because it is used, because
light has passed through it? Of course not. Why on earth
should it? Will the cells of the retina sort themselves
into three colour-sensitive classes, simply because they
are bombarded with light of different colours? Again, why
on earth should they?"

This sort of thing being the case, we should probably
conclude that Lamarckism can't account for the structure of
organs like our eyes--assuming, of course, that Mr. Dawkins
is correct and researchers _haven't_ in fact discovered
that eyes go through a development-through-use process like
this one. After all, our eyes do seem to be a bit different
when we're born. Is that change in any fashion dependent
upon the actual use of the eye? It may not be; but if so
then the Lamarckist might be able to claim that changes
made at that stage could be the point at which acquired
characteristics are fused into the genes (given, of course,
the ability to somehow scribe the change into an
individual's genetic code, which we have no evidence for at
present I'm aware of.)

However, in lieu of any experimental data along those
lines, I would be willing to accept _this_ particular
argument as being valid against Lamarckism. I cannot in
fairness, though, accept Mr. Dawkins' actual presentation
of the argument, which even after a pretty good example
like this goes right back to a cariacture of the
Lamarckian's position:

p 302, "The coupling between the explanation, and that
which is to be explained, is direct and detailed [in
Darwinism]. The Lamarckian theory, on the other hand,
relies on a loose and crude coupling: the rule that
anything that is used a great deal would be better if it
were bigger. This amounts to relying on a correlation
between the size of an organ and its effectiveness. If
there is such a correlation, it is surely an exceedingly

weak one. The Darwinian theory in effect relies on a correlation between the _effectiveness_ of an organ and its effectiveness: a necessarily perfect correlation!" [italics his]

Yet I note one last time that the Lamarckian position does not seem to _necessarily_ require such a "loose and crude" coupling: it might also attempt a correlation between effectiveness and effectiveness. And I have the best possible reason for thinking so: Mr. Dawkins himself has told me, back on page 291: "As a result the parts of the body used in the striving grow larger, **or otherwise change in an appropriate direction.**" [italics mine] So (until he conveniently forgets it), Mr. Dawkins himself does not claim that Lamarckism requires the "loose and crude" coupling of a mere increase of size: there might be other changes of an appropriate type!

All this being the case, then, I think we should take Mr. Dawkins literally (and not sarcastically modest) in his conclusion from page 303:

"Our refutation of Lamarckism, then, is **a bit** devestating." [italics mine]

Only a bit, though. He has some good points; they may even carry the day. But they seem to do so in spite of Mr. Dawkins' own efforts in their favor! Even on Mr. Dawkins' own valid arguments (ignoring for the moment his invalid ones), I think it's slightly unfair to claim that Lamarckism "is doomed from the start as a potential rival to Darwinism." (p 303) Mostly it is doomed _after we've been studying biology for a while_ as a potential rival to Darwinism. Once we began studying lifeforms looking for acquired characteristic traits, we found few or none. Once we had discovered DNA and studied long enough, we decided we were only finding recipes and not point-by-point chemical representations of Terran animals. The conclusion that light and muscle don't improve an eye's efficiency over an individual's life comes (if at all) from study of the eye, not as a foregone conclusion stemming from principles of Lamarckism itself (except under the cariactured version of Lamarckian use/disuse principles presented by Mr. Dawkins).

The only way in which Lamarckism might be considered doomed from the start, thanks to its underlying principles, would

perhaps be its failing to take into account the fact that
wear-and-tear are also acquired characteristics (rather
drastically more acquired, actually!); and getting around
this seems to require a process which ends up being
Darwinian in detail. In this one particular instance, I
might well agree that Lamarckism was doomed from the start;
the amusing thing is that Mr. Dawkins seems to imply that
the other issues doomed it from the start as well! I
disagree; in those cases, Lamarckism's principles did not
intrinsically require Darwinism--the data had to be sifted
through and analyzed before the tally was in. On those
cases, Lamarckism had a fair shot (for all we knew to the
contrary up till then); it just happened not to work out.

Having more-or-less disposed of Lamarckism (despite his own
tactics), Mr. Dawkins turns to neutralism, perhaps with a
bit more immediately plausible case that its principles
will undercut it as a rival against Darwinism in the case
of adaptive development. (As Mr. Dawkins noted last
chapter, and I think at least once earlier in TBW,
neutralism may in fact work side-by-side or within
Darwinism to help account for some things--what Mr. Dawkins
here calls the "boring" things! (p 303))

p 303, "The idea [of neutralism], you will remember, is
that different versions of the same molecule, for instance
versions of the haemoglobin molecule differing in their
precise amino acid sequences, are exactly as good as each
other. This means that mutations from one alternative
version of haemoglobin to another are _neutral_ are far as
natural selection is concerned. Neutralists believe that
the vast majority of evolutionary changes, at the level of
molecular genetics, are neutral -- _random_ with respect to
natural selection." [italics his]

I'm not entirely sure about whether they'd consider them
'random' or not as an _equivalence_ to 'neutral'.
'Ineffective' might be a better word; it works just fine in
his brief discussion about neutralism (summing up a page of
discussion, neutralism is not a competitor to Darwinism
because by default the neutralists are not trying to
account for development and apparent design). Of course, a
major chunk of Mr. Dawkins' argument against a Designer
(something which has intent) has relied on requiring
definitions of random and non-random mutually stripped of
all relation to intent--which is another way of excluding,
before the game starts, the Designer from ever getting on

the field to play. So he has a vested interest in bringing
up this peculiar distinction again in this chapter, like
so:

p 304, "Everybody on both sides [of the debate over whether
most mutation change is neutral] agrees that neutral
evolution cannot lead to adaptive improvement, for the
simple reason that neutral evolution is, by definition,
random; and adaptive improvement is, by definition, non-
random."

However, as I've already argued extensively (and even
extended some credit) concerning his use of 'random' at
those earlier places in TBW, I'll pass it by with no more
ado here.

Up next, 'mutationism': an actual rival to Darwinism in the
early part of the twentieth century. In a way, mutationists
were perhaps half-Darwinians; they attempted to discount or
minimize the function of natural selection, and focused
almost entirely on the mutation side of the process. There
were some very influential people who were mutationists,
including Wilhelm Johannsen (the fellow who invented the
word 'gene'), Thomas Hunt Morgan (who developed the
chromosome theory), and Hugo de Vries and William Bateson
(who rediscovered Mendel's principles of heredity.) Mendel,
you'll remember, was the fellow in the monastary, whose
principles eventually ended up being a "central plank" of
Darwinism today. (Mr. Dawkins' own laudation, p 305. Pretty
cool for a theist!)

p 304, "It is extremely hard for the modern mind to respond
to this idea [that the really creative force was mutation
itself] with anything but mirth..."

Well, I don't know about _that_; presumably those early
twentieth-century guys, and their nineteenth-century
predecessors, were pretty 'modern' themselves; that's why
they rejected flat creationistic theism, right? Modern is
as modern does, I suppose. I wonder sometimes how long it
will take before our own age is spoken of with this sort of
flippant--and ungrounded, when automatic--contempt.
Furthermore, I find it extremely hard to believe that Mr.
Dawkins' target audience (who all live in the same decade
he does and are presumably not very familiar with
biological evolutionary theory, which is why he's writing
TBW to begin with) would find anything automatically funny

or ludicrous about this idea simply by being members of the
culture of the surrounding few decades. Isn't it more
likely that we'd just go, 'Hm. So why did they think that?'
and then wait for an answer before suppressing fits of
laughter at these fellows' naiveity? Actually, I think this
is only another tactic to play on any snobbishness we may
have; 'Why, yes, I _do_ think of myself as a "modern"
fellow... Hah! Those early 20th century rubes! Tell me what
they were obviously wrong about!'

Of course, given some of his earlier antipathy, we might
suspect that Mr. Dawkins sets the deck against these guys
from the getgo because they had a different kind of
philosophy, which he's going to reject but not really
argue against--flippant dismissive attitude substituting
for brainwork. There's a bit of evidence along this line
supplied by Mr. Dawkins himself as the concluding part of
this sentence, starting right after "anything but
mirth...":

p 305, "... but we must beware of repeating the patronizing
tone of Bateson himself [note: though being quite the
baroque operator, Mr. Dawkins repeated that patronizing
tone anyway in the first part of this sentence]: 'We go to
Darwin for his incomparable collection of facts [but...]
for us he speaks no more with **philosophical authority**.
We read his scheme of Evolution as we would those of
Lucretius or Lamarck.'" [italics mine in Bateson's quote]

Well! _That_ is extremely interesting to me! We know where
Lamarck's philosophical base lay (and what Mr. Dawkins'
dismissive opinion was of it, too). Lucretius was an
ancient Greek mechanistic philosopher (that's ancient as in
pre-Christian, and maybe pre-fully developed Judaism).
Bateson is dismissing Darwin's _PHILOSOPHICAL_ authority;
unless Mr. Dawkins has taken him out of context (and he has
supplied no correctives in TBW, so I can only go with what
he's saying) I'd say Bateson equated Darwin's
philosophically mechanistic principles with Lucretius'. Of
course, that's the overriding philosophy that drives
evolutionism (the philosophy, not the science--some other
philosophies can still run the biology of evolution.) It's
pretty clear where Mr. Dawkins stands on that issue (check
TBW's subtitle again for a quick refresh, in case you've
forgotten.) "Vewwwwy Cuwious!", as Elmer Fudd might say...
Let's see if anything else crops up along those lines, and
whether Mr. Dawkins intends to make a fair argument against

mutationism. I think he's got a good chance, if he'll take it...

And, he does!

p 305, "The problem with mutation as the sole evolutionary force is simply stated: how on earth is mutation supposed to _'know'_ what will be good for the animal and what will not?" [italics his]

Yes! Just like in what I consider to be his key (successful) rebuttal against Lamarckism, he's going to zap mutationism on a similar weakness.

p 305, "Anybody who wants to argue that mutation, without selection, is the driving force of evolution, must explain how it comes about that mutations tend to be for the better. By what mysterious, built-in wisdom does the body choose to mutate in the direction of getting better rather than getting worse? You will observe that this is really the same question, in another guise, as we posed for Lamarckism."

Am I good, or what? Seriously, I didn't read ahead!

Mr. Dawkins says here on page 306 that the mutationists "never answered the question" and "left open the question of how the body 'knew' what changes would be good for it in the future." But I also notice in the very next sentence he states that we "write this off **as mystical nonsense**". [my italics] Well, again! I'm starting to suspect that they didn't quite "leave the question open" of how it happened; they filled in the blank with a philosophical position, which Mr. Dawkins isn't going to bother to actually _argue_ against, but _presume_ against. However, I have my own skirmishes to tidy up here, so I'll leave their defense to someone else who wants to take a crack at it.

Meanwhile, Mr. Dawkins proceeds on (presumably) more scientific grounds to argue against mutationism by launching a discussion of the definition of randomness with respect to mutation. Perhaps I'll be excused for thinking, at this late date, that we're about to see the 6=16 paradigm again:

p 306, "There is randomness and randomness, and many people confuse different meanings of the word. There are, in truth, many respects in which mutation is not random."

Tell me about it... Well, actually, he does! Not a bad discussion of it, either. Like some of his other discussions of randomness, it only suffers by the quietly selective tactic of excluding an option from the getgo. He provides a nice summary on page 307:

"If you take 'random mutation' to mean that mutations are not influenced by external events, then X-rays disprove the contention that mutation is random. If you think 'random mutation' implies that all genes are equally likely to mutate, then hot spots show that mutation is not random. If you think 'random mutation' implies that at all chromosomal loci the mutation pressure is zero, then once again mutation is not random. It is **only** if you define 'random' as meaning 'no general bias towards bodily improvement' that mutation is truly random." [italics]

Well, not quite. It is also only truly random if God doesn't exist or never bothers to tamper with it (for whatever reason.) The possibility of intent is quietly excluded... and ta-daaa! The Evidence of Evolution Reveals a Universe Without Design! It's the Argument from Quiet Exclusion, featured prominently back in Chapter 6, and stretching at least as far back as page 7!

However, let me fairly note that the next several pages feature (by and large) a well-constructed reply from Mr. Dawkins to a class of opponents who try to redefine the evolutionist's term 'random' to mean "_All_ changes are held to be possible and all _equally likely_." (p 307, Mr. Dawkins quoting from P. Saunders and M-W. Ho, italics his.) I know; it sucks when the opposition takes one of your key definitions and redefines it for you into a state that you weren't advocating so that they can win. Really bites.

p 308, "It is clear that a kind of caricature of a Darwinian has been set up, whose notion of randomness is an absurd, if not actually meaningless, extreme. It took me a while to understand this caricature, for it was so foreign to the way of thinking of the Darwinians that I know."

Sing it, brother; I'm sympathizing big-time...

Apparently, the tactic of this sort of opponent is to paint a Darwinist as a hyper-anti-mutationist; mutation is virtually nothing, selection is everything. Aside from being grossly unfair it can't really be said to be dealing with the Darwinian issue (discreetly amused cough!). Mr. Dawkins provides an imaginary dialogue between a real-life Darwinian and a hyper-selective caricature, to illustrate the differences between them. Of course, in the process, he can't quite resist appealing to a few caricatures himself:

p 309, "We shall [illustrate the difference between the real-life Darwinian and the caricature] in terms of a particular example, the difference between the flight techniques of bats and of angels."

Snort! First off, angels are not always portrayed as having feathery wings sprouting from their backs. In fact, in Scripture we get either rather more mundane images (young men with faces like lightning and super-bright clothing, which are the only forms they appear in when on active duty on earth, as far as Scripture is concerned) or far more bizzare images (the angels in the dreams of Isaiah, Ezekiel and John of Patmos). The closest Scriptural image to the 'traditional' view would be the crane-winged women carrying the wickedness-filled basket in one of Isaiah's dreams (I think), and I'm not entirely convinced they were supposed to be angels per se. Second, only caricatured Christians would consider an angel's "flight techniques" to have anything to do with wings; they're a symbol of unimpeded spiritual speed translated into biological terms for purposes of imagination. Angels don't fly with them. Third--why _angels_ and bats?? Why not demons and bats? Why not angels and birds? If he's going to make fun of us, at least get the imagery straight and do it right. Why not dragons and bats? Some (not all) of _them_ have been portrayed with a third set of winged limbs, and they fit into the psuedo-science criteria nice and cleanly; as he himself notes when he gets to the fire-breathing example! Answer to all three questions: because why waste an opportunity to make your chief opponent look goofy at any cost? Counter-answer: "It is clear that a kind of caricature of a [theist] has been set up, whose notion of [angels] is an absurd, if not actually meaningless, extreme. [...] Unfortunately some people _think_ [this sort of cariactured theist] exists, and think that, since they disagree with him, they are disagreeing with [theism] itself." (paraphrased from the top of p 308 and p 311, italics his.)

And, in passing, I note that Mr. Dawkins tosses a "Rank
mysticism! Get back in the last century where you belong"
from both sorts of Darwinians to the Mutationist. (p 310)
Maybe 'last century' was a poor choice of phrase, though,
since after all, Darwinism _was_ developed during that same
'last century'! Meanwhile, would you say that Mr. Dawkins
is properly dealing with the rank mystics, or simply
discarding them out of hand with appeals to us of snobbish
flippancy?

At any rate, he spends the next page (311) illustrating
that mutation is non-random "in the sense that it can only
make alterations to _existing_ processes of embryonic
development." (p 312, italics his) He continues to use
angels' wings for some reason (well, I guess we know why),
but otherwise does a pretty good job.

Ah-hey! Here's a fifth category of potential non-randomness
for mutations:

p 312, "We can imagine (just) a form of mutation that was
systematically biased in the direction of improving the
animal's adaptedness to its life. But although we can
imagine it, nobody has ever come close to suggesting any
means by which this bias could come about."

No means _strictly within the mechanistic science_! He's
talking about 'intent' here, folks--he's just being cagey
with his wording. After all, it would be rather a shock to
come straight out and say 'There is no such thing as cosmic
intent (be it vitalistic pantheism, or creationistic
theism, or whatever), therefore this basic level of
mutation must be random, therefore only naturalistic
evolution remains standing, therefore there is no such
thing as cosmic intent.'

In a way I'm surprised, and in a way I'm not. It turns out
after all that Mr. Dawkins' ultimate argument against the
mutationists boils down in essence to "Rank mysticism! Get
back in the last century where you belong." Mutationism
cannot be right ("never could have been right", p 312)
because it would necessarily imply some kind of cosmic
intent, and there is no such thing as cosmic intent--
presumably because it's a woolly old idea! However, he did
give us a useful corrective concerning misrepresenting

Darwinians as hyper-selectionists. Amusing in its context, but useful and interesting.

Next-to-last (guess who has the distinction of being up to bat on the final play?) Mr. Dawkins discusses something not featured on the opening list in this chapter: "molecular drive" theory, as championed by the Cambridge geneticist Gabriel Dover (though at this point I'm a tad sceptical as to whether we're really going to get Dover's theory.) Mr. Dawkins engages in a wry bit of (appropriate, as far as I can tell) humor:

p 312, "[S]ince everything is made of molecules it is not obvious why Dover's hypothetical process should deserve the name _molecular_ drive any more than any other evolutionary process; it reminds me of a man I knew who complained of a gastric stomach, and worked things out using his mental brain."

At any rate, this particular theory looks like the mutationist theory (selection is worth practically nothing, mutation sets up everything), but attempts to account for improvements by positing that once any species has mutated, it will just change its habits to conform to its new relationship with the environment. I guess the theory is that if the soles of the feet get a bit more tender thanks to a mutation, the species just won't walk as hard on them. If the tender spots get a bit more light-sensitive, the species will survive a bit better in some fashion and change its habits accordingly. Over evolutionistic periods of time, the species could grow eyes in the soles of its feet.

As presented by Mr. Dawkins this theory looks like bosh--which makes me immediately suspicious that he hasn't represented it fairly. Taken as it's presented, though, it leaves some open holes. Mr. Dawkins really only brings up one--the number of livable environments necessary for this sort of thing to work is prohibitively large. I can think of at least one more: mutations happen to individuals, not to species, and if I can trust the sort of genetic bloops that happen to humans, not every alteration results in a condition which the individual simply adapts to. When the gene for muscular dystrophy happens to be on the primary chromosome, then the recipient is hardly likely to survive to replicate, or even be a mating prospect. It only gets

passed on at all by sometimes going from a recessive
chromosome to another recessive chromosome unseen.

However, I'm not terribly inclined to argue against Dover,
because I get the impression that Mr. Dawkins is
caricaturizing his theory, too (meaning I don't have a fair
shot, even assuming I wanted to.) I don't get the
impression from even Mr. Dawkins' abbreviated version of
Doverism (to coin a phrase) that Dover is anything other
than a gradualist; he allows a large number of steps
between, say, plain skin and an eye. Mr. Dawkins agrees
that this seems an acceptable assumption for the sake of
argument (p 314); so two gradualists find some common
ground. One of them promptly accuses the other of actually
being something like a saltationist: once mutation #1
occurred (according to Mr. Dawkins' version of Doverism),
the species "searched the world for a new place or a new
way of life in which they could use this new random feature
that had been imposed upon their bodies."

Well, really, that's kind of extreme for one little change,
isn't it? Maybe Mr. Dawkins only means something like 'the
species had to struggle to fit into its current environment
in a new way'? Nope, after mutation #2 the species is out
"scouring the world" again! (p 314.) Now, come on--when
Dover says that the species "locates that member of the set
of all environments that best fits its imposed nature", it
doesn't necessarily mean the poor species is left
"scouring" the planet looking for it. If the soles of its
feet get a little more tender, it doesn't walk as much on
sharp rocks. Maybe Dover really does mean something as
extreme as Mr. Dawkins is providing us here; but frankly,
how am I supposed to tell? I should think that in a book
like this I could trust him to be fair and honest, but I've
hardly gotten that impression from him in places I _could_
check him. Rather than tossing Doverism as a live option
(which is what Mr. Dawkins wants us to do), I think I'm
justified at this point in witholding my assent to
rejecting Doverism until I see more information on the
subject from a more reliable source.

In a brief side-detour by Mr. Dawkins, before we get to the
Mack-Daddy finale, he explains why Darwinian natural
selection isn't derailed by the sort of 'large-numbers
argument' he applied against Doverism (be it a valid
application or not, who can say at this point?) In the case
of Darwinian evolution, the difference (assuming for the

moment the validity of his argument against Doverism) is
that all possible future permutations of a given species
don't have to exist as possibilities for it to work. He
tells us (rightly or wrongly) that Doverism _requires_ the
actual existence of 1x10^301 viable environments (capable
of being reached by the species before it goes extinct, of
course) for it to work. But Darwinian evolution threads its
way through the 1x10^301 technically possible animals
involved in a 1000-step eye without requiring that all of
them exist. Thus, the same argument cannot be held against
it. I'm just as willing as Mr. Dawkins to bring this up,
not only to be as fair as possible to Darwinian biological
evolutionary theory, but also so I can point out that this
has no bearing whatsoever on some of the problems I've
uprooted in Mr. Dawkins' presentation using large numbers
myself. This is a response to a completely different
potential complaint; and I've got no problem with the
response.

Two and 1/4 pages to go in TBW! Yayy!! Here we are: we can
put it off no longer. The oft-spoken-of-in-"doom"-laden-
voice rebuttal to creationism! And we're not just talking
about the flat creationism held by those backwoods
fundamentalists! He means:

p 316, "This is the theory that life was created, or its
evolution master-minded, by a conscious designer."

Yep, it's time to step up to the on-guard line. Tank-or-
tricycle time...

p 316, "It would obviously be unfairly easy to demolish
some particular version of this theory such as the one (or
it may be two) spelled out in Genesis."

Not that he's going to let that stop him from giving it a
shot anyway in the rest of this paragraph, I notice!
Frankly, up to this point, I've been surprised how little
of TBW actually _affects_ the theories from that
"particular version"! I may actually need to revise my
estimate of the ultraliteralist versions _up_ a notch or
two... who'd'a'thunkit?

p 316, "Nearly all people have developed their own creation
myth, and the Genesis story is just the one that happened
to have been adopted by one particular tribe of Middle
Eastern herders. It has no more special status than the

belief of a particular West African tribe that the world was created from the excrement of ants. **All** these myths have in common that they depend upon the deliberate intentions of some kind of supernatural being." [italics]

Gosh, where to start on _this_ little tidbit? This could take a whole book unto itself! Let me see if I can keep this pertinent while not providing a full course in comparative theology...

a.) Not unsurprisingly, we get another disparaging remark calculated mainly to appeal to our own sense of superiority. _We_ are not ancient Middle Eastern herders, therefore _they_ must be wrong enough that we can safely discount them. Of course, _they_ managed to figure out that eating pork and milk-boiled baby goats in that environment was a Bad Idea, but they're ancient Middle Eastern herders who never heard of cysts, so _we_ can safely ignore them using the same logic.

b.) Behind this sort of blow-off lies an unstated (but quite necessary) belief that I've discovered lurking beneath similar statements by correspondents: God would have provided full scientific information (along the lines of what we get nowadays) to those ancient Middle Eastern herders if they really wrote under His inspiration. The modern details obviously aren't there; we obviously have better science; therefore we can safely ignore the parts that _don't_ make potentially verifiable scientific statements. Now try to keep this in mind for a moment: assuming for purposes of argument that biological evolutionary theory (as opposed to flat creationism) is true _and_ that God designed, instituted and runs it, what kind of explanation would you expect Him to give to those people?

They're not going to understand interstellar (or even intrasolar) astrophysics, but they got the order of (non-picturable) creation correct: heavens, and earth, in that order. From the vantage point of someone on the surface, we've got land, water, and darkness (heavy cloud cover while the water cycle is being set up.) The next noticeable thing from the sensory angle would be the emergence of the lights (sun, moon, stars) and the institution of a noticeable night and day (now that the thick cloud-cover has gone). True, the language there can be read to mean that God created the lights at that point, but you'll

notice that the actual phrase reads something like "Let there be light!" (not "created" like heavens and earth.) Once you know the _answer_ (the lights would have to have been created first back in verse 1, and just not visible during the point in time when the first life was getting started--during the early ocean days, with the clay-arches and RNA strands and first bacteriums, even before plants were developed that needed sunlight), then the language can allow the corrected impression. Then follow the plants, then the animals, then humans, etc. All told, it's a pretty impressive sequence. Even kids today can get the important points (God designed and created it all with a specific sequence, still maintains it, was pleased with the design, set humans up with a special divine ability.) The rough _details_ admit an increase in the scientific knowledge. Hey, if Cairns-Smith is correct, they even managed to get the _clay_ right! This is more accurate even in the literal details (much less the increase in detail it can placehold) than giants birthing people from armpits or the ant-excrement tale.

c.) It's got a different set of metaphysics, too. There may be another ancient creation story out there where a rational entity, who is qualitatively different from nature, creates nature (and subordinate supernatures, though those aren't brought into the Genesis story--not really necessary at that point) out of pretty-much nothing (ex nihilo is the theological term). However, _I_ haven't seen it yet. (The Egptian Hymn to the Sun from Akhenaten's monotheism may qualify, though I'm not sure it counts as a creation _story_ as much as a theological manifesto in poetry form.) Usually, either the Creator turns out to be qualitatively the same sort of thing as the nature He (or She or It) creates (the ant-tale would belong to this category); or there's a _non_-sentient system already in place which spontaneously births sentient beings and the natural order (the Greek Chaos or Norse fire/ice/north/south would be good examples of this category). True, the first class of story sometimes has the innate ability to be read in a more rigorously metaphysically theistic manner; then again, the second class of story has the innate ability to be read in a more rigorously naturalistic manner! Should I toss evolutionism because some of its key concepts happen to be embodied (with what we'd consider faulty scientific details) in, for instance, Greek and Norse religions? Sauce for the goose again.

d.) This particular Middle Eastern herder myth, whatever
else we can say about it, has _one_ extremely important
"special status"--its presuppositions formed for centuries
the bedrock of ethics and natural law out of which we
developed the sciences themselves (including virtually all
the mental disciplines used by Darwin in his scientific
endeavors), and by which Mr. Dawkins can arguably be shown
to adhere today. I don't mean technologies, per se--China
beat us to gunpowder, for instance. I mean the disciplinary
outlook of scientific process.

I could go on about this a while longer, but I trust the
point has been sufficiently made for the moment: that
particular paragraph illustrates only enough familiarity
with the data to be dangerous. Otherwise it's outright, and
rather snotty, ignorance. There's a ton about comparative
theology I don't know; but I apparently know more than Mr.
Dawkins does, and that paragraph as it stands is almost
totally a crock of... well, ant-poop.

Having 'dealt' with the "naive Bible-thumper" (p 316), Mr.
Dawkins turns his attention (such as it is) to the
"theologians of sophistication"--the ones who've given up
believing in instantaneous creation and accept some variety
of biological evolution. (Mr. Dawkins particularly has in
mind the Bishop of Birmingham from back in Chapter 2.) As
far as Mr. Dawkins is concerned, we sophisticated types:

p 316, "...smuggle God in by the back door: they allow him
some sort of supervisory role over the course that
evolution has taken, either influencing key moments in the
evolutionary history (especially, of course, _human_
evolutionary history), or even meddling more
comprehensively in the day-to-day events that add up to
evolutionary change."

Rather than engage in a standup fight, then, Mr. Dawkins
prefers to use loaded description, hidden presumption and
outright suppression to 'deal' with the sophisticates. (Not
much of a different strategy than he deemed fitting for the
thumpers, come to think of it!) I have several points to
make about this as well.

1.) Mr. Dawkins has flatly ignored any theistic argument
other than the Argument from Design, which admittedly
smuggles God onto the field as a referee before the game

starts. By simply not mentioning any of the other arguments (including the devestating arguments from reason and morality which have more than a passing relationship with evolutionary theories) Mr. Dawkins apparently hopes to befuddle readers into thinking that one straw man burning takes out all the King's Men. This can hardly be said to be dealing with the 'sophisticates'. In fact, I can reproduce several arguments in favor of the existence and character of a supernatural God from Mr. Dawkins' _own positions and arguments in TBW!!_ Think I'm kidding? We'll get back to this in chapter 13...

2.) A good deal of what strength this description has, depends on how convinced you are by this point that Mr. Dawkins has set up a viable argument not only in favor of biological evolutionary theory, but its ability to sufficiently account for all human characteristics, in both cases without self-contradiction. Given the massive number of errors in methodology and procedure which I've tagged in TBW, I don't think I'm obligated to grant Mr. Dawkins any slack in this regard.

3.) Duh! Of _course_ theologians would be particularly interested in whatever actions God has taken in _human_ history (provided we could discover them.) After all, we _are_ human; we not only have a vested interest, we don't have many options concerning a real other-species perspective. We study wolves, for instance, from the vantagepoint of our own humanity, not from an actually achievable lupine vantagepoint. It's unfair to flay the theologians for taking a perspective _none_ of us can help taking--unless of course Mr. Dawkins wishes to agree that sufficiently objective conclusions may be reached _despite_ our common humanity. But if he agrees with this (and I can't see how he'd avoid it without gutting his own book as being cripplingly humanocentric thanks to his own unavoidable humanity), then the theologians cannot be simply dismissed either. For all we know _before_ we seriously listen to their claims, they might have also reached objectively true conclusions about reality despite their necessarily human perspective.

4.) "Meddling?" Gosh, theologians must be proposing and defending the existence of a annoying old half-incompetent busybody, puttering about casually in affairs which are really none of His business! It seemed to me we had been proposing Someone rather different, but I suppose I should

trust Mr. Dawkins' description--because he's been so very
fair and accurate up to this point with his representation
of the opposition, right? Pah!

Having so thoroughly described the position of the
'sophisticates', Mr. Dawkins admits once more that TBW's
subtitle thoroughly misleads (I'm getting a lot of milage
out of that subtitle, eh? Perhaps he should revise it in
future editions...): "We cannot disprove beliefs like
these..." (p 316). But he's got a _very_ particular set of
"these" beliefs in mind:

p 316, "...especially if it is assumed that God took care
that his interventions always closely mimicked what would
be expected from evolution by natural selection."

Ah, but the 'sophisticates' whom _I_ am familiar with argue
precisely that there are some necessary aspects of the
human condition which cannot _in principle_ be explained by
natural selection (with or without random genetic
mutation.) And I'm not talking about complexity of physical
structure, either; by this time you should be quite
familiar with what I mean (though if you need a refresher,
wait until chapter 13--I'll let Mr. Dawkins himself argue
my own points for me!) Therefore I obviously deny the
charge that a belief in God (and in God's role in human
development, at the very least) is "superfluous". (p 316)
There is a great deal more "that we can say about such
beliefs" (p 316) than Mr. Dawkins presents in TBW.

In perhaps the most staggering example of short-sighted
irony in the entire book, Mr. Dawkins proceeds (after
reducing all apologetics to circular AfD methodology) with
the following description:

p 316, "[S]econdly, [beliefs in God] _assume_ the existence
of the main thing we want to _explain_, namely organized
complexity. The one thing that makes evolution such a neat
theory is that it explains how organized complexity can
arise out of primeval simplicity."

Aside from the fact that he relies on just this same sort
of circularity himself to get several levels of his
argument off the ground (see Chapter 12 for an overview
along this line), Mr. Dawkins smooths over several sorts of
characteristics, not only of God, but of Nature _as he
himself presents Nature_ in order to draw a 'conclusion' of

this sort. Here are several things to remember as we
analyze this final salvo in Mr. Dawkins' attempts to
convince his readers to reject God as a viable theory:

a.) As I pointed out back in Chapter 1, the universe itself
has _never_ been simple, even in its 'primeval' state.
Biological evolutionary theory does _not_ explain how
complexity arises out of simplicity, but how particular
sorts of physical complexity arise out of the general
overall macro-complexity that is Nature itself. It is
philosophical evolutionism, not biological evolutionary
theory, which requires that true complexity arises out of
true simplicity--for example, that the laws of entropy are
regularly transcended at a fundamental level; that
reactions can become actions; that from nothing
(specifically the nothing of blind, purposeless, automatic
nonrationality) can come something (specifically real,
insightful, truly intent, initiative rationality,
sufficiently free from nonrational causality to be
considered something really other than nonrational
causality.) It is philosophical evolutionism which requires
that 0 (or 1) becomes 16 under its own intrinsic
properties, which probably explains why 6=16 is such a
popular tactic in TBW--the principle that something really
is itself but is really something completely different from
itself, is not just a clever way to make an otherwise
unworkable statement seem to work, but also trains its
accepter to further accept all sorts of violations of the
law of noncontradiction, including 'From nothing comes
nothing'. A biological evolutionary theorist would be
content to work out the different ways of stating that
16=16: the particular effects of ultracomplicated nature
under certain conditions, within its own framework--which
includes the sort of fundamental transfer of its ultimate
properties (like nonintentionality in the beaver-dam
example) within its systemic processes.

b.) The use of the term "organized complexity", coming
where it does in Mr. Dawkins' statement, implies that
theism doesn't explain organization at any level (including
the divine), while evolution does. (It's the "one thing
that makes it such a neat theory".) However, this
distinction can only succeed by reducing the definition of
the term 'organized', and even then the distinction reaches
mere parity.

What does 'organized' mean here? Complex versus simple?
Then the term is redundant (complex complexity), and under
either set of theories (naturalism or theism) something
with ultimate complexity (Nature or God) is posited and not
explained as proceeding _to_ complexity.

Does 'organized' mean particularly _efficient_ complexity
(with regard to certain effects?) Then a stalemate is
reached again--_both_ theories have ultimately efficient
Independent Facts in a non-reducible state (Nature or God),
and presumably either sort of IF can provide the particular
efficiencies in _dependent_ entities. (Obviously I'm
setting aside any questions about evolution's success at
explaining something like real reason as a _dependent_
effect of nonrational properties.) Under this definition,
there's no reason to choose (or reject) one over the other.
Other arguments would have to be recoursed to.

Does 'organized' mean that _all_ complexities must proceed
from ultimate simplicities? But this begs the question: no
self-consistent theist claims that God developed His own
complexity, or that His complexity was developed by
something else; _and_ the only way a naturalist avoids
fundamentally violating the law of noncontradiction is by
positing that Nature is eternal (and thus eternally
complicated, though the form of complexity may of course
change.) Of course, some naturalists _do_ propose that
total reality 'developed' from absolutely nothing; but
biological evolutionary theory certainly has no ability to
help explain _that_. At best, mated with philosophical
evolutionism, it merely would take that principle (a
violation of the law of noncontradiction) and make it the
cornerstone which all its arguments ultimately use. So
again, either it's a wash, or biological evolutionary
theory actually falls _short_ of theism's ability to
explain processional development of Nature as a whole.

Or does 'organized complexity' mean _intended_ (or
designed) complexity? Then the tables are turned
dramatically, for only theism can offer an explanation of
truly intended complexity! God's own complexity (not being
strictly designed) would not be at issue. Of course, such
an 'explanation' for the complexity of anything other than
God would be the circular Argument from Design again (this
designed thing proves that there is a Designer, but only by
assuming a Designer with the adjective 'designed'.) But
philosophical evolutionism fares no better, for it can only

offer an explanation for _merely apparent_ design--and the
'merely apparent' part must also be presumed! (Or, at best,
argued from the philosophy, not the biology.)

And this highlights again one of the key discrepencies in
this philosophy--its adherents claim (whether validly or
invalidly) that anything that looks like design in nature
is not really design, yet they also claim that real design
(like their own argument) is possible _from within_ that
system. So far I've only seen them 'accomplish' this by
shuffling definitions whenever the position becomes
difficult to defend (as Mr. Dawkins exemplifies in TBW). To
me it seems more logical to accept that the final ground of
reality must include sentience as a fundamental property,
which it may or may not transfer as a property to its
dependents, than to believe that a system automatically
produces entities capable of transcending the qualities of
the system's fundamental properties.

You'll recall (p 293, this chapter) that Mr. Dawkins is
prepared to reject out of hand any report (even his own
eyewitness account, should it occur) of a man levitating
himself. Why? Because such an event (if it were what it
claimed to be, and not a trick or hallucination) would not
be fully describable by natural law. Mr. Dawkins insists
that accepting such an event would require rejecting all of
physics. This is another way of saying that such an event
would be a contradiction in terms in a naturalistic
universe; it would entail rejecting the proposition that
physics is all, and so for someone committed to that
proposition it would entail the rejection of all of
physics. The supernaturalist would also insist that such an
event (if it were what it claims to be) would illustrate a
rejection of the proposition that physics is all, but since
she already holds a philosophical belief that physics is
not all, then she is not thereby committed to the wholesale
rejection of physics.

The naturalist, as much as the theist, ends up committed to
the proposition that natural law can be transcended
(typically by the naturalist's own thinking and ethical
judgements); but unlike the theist, the naturalist is also
committed to the proposition that Nature is everything and
all events _must_ be exhibitions of natural law. This
discrepency, in a nutshell, is why I am not a naturalist.

Now, keeping in mind the notes I presented earlier
concerning the issues of 'complexity', let's follow Mr.
Dawkins through his line of attack:

p 316, "If we want to postulate a deity capable of
engineering all the organized complexity in the world,
either instantaneously or by guiding evolution, that deity
must already have been vastly complex in the first place."

True; but then, so is Nature as a going concern. Whatever
the IF happens to be, it will be the most real, articulated
and 'complex' entity in existence; all other entities will
be derivations of (or expressions of) its own complexity.
The strict naturalist should have no problem with this; and
the philosophical evolutionismist ignores this fact at the
peril of his own theory's internal consistency.
Evolutionism (the philosophy) offers no advantage on this
score.

p 316, "The creationist, whether a naive Bible-thumper or
an educated bishop, simply _postulates_ an already existing
being of prodigious intelligence and complexity."

In the case of the Argument from Design, this is entirely
true; and this is what makes the AfD circular (and thus
useless as primary argumentation.) But not all theistic
apologetics are the AfD.

p 316, "If we are going to allow ourselves the luxury of
postulating **organized** complexity without offering an
explanation, we might as well make a job of it and simply
postulate the existence of life **as we know it!**"
[italics mine]

Although this sentence is technically true, it only
functions as an argument against _accepting_ theism (and
not even an argument against the _truth_ of theism, which
is a different sort of argument) by surriptiously
redefining the characteristics of a theistic God such that
He requires development Himself _and_ counts as life _as we
know it_ (which in Mr. Dawkins' mouth presumably means
'life as biologists know it'.) Otherwise, there would be a
significant difference between simply positing the
existence of biological life and positing the existence of
God--whatever else we say about biological life (including
us), it is _dependent_ and the 'life' of God is
independent. But of course, the best apologetic theories do

not start with the simple posit of God's existence to
argue for God's existence; so it's almost a moot point.

And with this, Mr. Dawkins considers his much-ballyhooed
argument against theism 'in principle' to be completed. But
as someone whose own expertise (such as it is) focuses on
the applications and analysis of an argument's principles,
I can only regard the following statement from Mr. Dawkins
to be an example of utter incompetence on the subject:

p 317, "The theory of evolution by cumulative natural
selection is the only theory we know of that is in
principle _capable_ of explaining the existence of
organized complexity." [italics his]

My evidence for the rather sharp label 'utter incompetence
on this subject' has been provided throughout SMB. Mr.
Dawkins provides, over the conclusion of this chapter, his
own summary of positions in the book, but rather than
replying to his summary, I've provided my own in-depth
summary of his positions (both sensible and nonsensical) in
the next chapter.

Chapter 12: The Cracks of Doom

I ended the last chapter, and my analysis of Richard
Dawkins' _The Blind Watchmaker_ with the rather invective
verdict: "utter incompetence on this subject" ("this
subject" being the use of principle analysis as a basis for
arguing for and against a proposed system). Actually, I'm
surprised about that--I had supposed from his reputation,
awards, etc., that Mr. Dawkins had at least _some_ good
arguments against theism. Instead I find a book so riddled
with systemic flaws, shoddy methodology and purile
argumentation that I can only regard its widespread
acceptance and honoration to be a symptom of either our
society's burning desire to reject God, or our fundamental
incompetence at teaching cogent analysis methods--or
perhaps both. There are some arguments in favor of God
which only the most fervently devoted fanatic will accept;
but there are similar arguments _against_ God. Mr. Dawkins'
strongest advantage is the thin patina of sensible science
with which he veils the crumbling edifice for presentation.
And even here, I find that in his efforts to present a
convincing philosophical argument, he must rip the validity
of some of his science. Actually, in methodology (and on
occasion even in tone of presentation) TBW resembles, to
me, the ultrafundamentalistic arguments which Mr. Dawkins
so despises. I've seen this before, and I'm becoming
convinced that such tactics make up much more of the
atheistic side of the debate than I ever previously
suspected. I call it 'fundamentalistic atheism'; and I
suspect that more often than not, a fundamentalistic
atheist hails from a fundamentalistic theist background.
(Not that I know enough about Mr. Dawkins' past to suggest
he falls into this category; he may be an exception.)

Such a person grows up indoctrinated in rigorously (and
admittedly not often very sensible) fundamentalistic
'argumentation' techniques. Then this person becomes
exposed to oppositional arguments. Not being trained well
enough to adequately analyze a position, this person may
find a poorly designed oppositional argument (or series of
them) to be persuasive; particularly if she is already
looking for loopholes in her beliefs--going through normal
teenage rebellion phases, or coming under fierce social
pressure, or perhaps even responding with (an otherwise
perfectly valid) righteous indignation to hypocrisy and
injustice in the Church (be it her local congregation or
history of her denomination, or what-have-you.) In these

circumstances, a person may reject theism altogether and embrace atheism (or other oppositional belief.) But in the process, she is very likely to port her methodologies (both emotional and cognitive) to her new belief. But a faulty methodology doesn't suddenly become valid merely by changing the overall topic under consideration. (A faulty methodology might become valid by paring down the topical scope, but even that cannot be guaranteed.) An atheist has just as much responsibility for polishing and refining and self-critiquing her position as a theist does.

Now, I find it extremely obvious that Mr. Dawkins has never bothered to polish, refine or self-critique his own position sufficiently; there are far, _FAR_ too many holes in his argument for me to believe this. (I am charitibly assuming that this is not merely indicative of naturalism, and philosophical evolutionism's, generally poor ability to coherently account for reality--though I'm not discounting that possibility, either!) At the same time, he does present what I have called a "thin patina of sensible science"; and in fact (every once in a great while) he even scores a few points which some of my more volatile brethren should fairly acknowledge!

So before I present a summary of the mistakes I have found in TBW, let me spend half a chapter tallying up the sensible and useful material I found in Mr. Dawkins' book. (Note: These are only the parts that struck me as being _particularly_ sensible, well-written, accurate, etc. There were some large swatches with mainly average writing that I do not want counted against the book, as average writing can still be true and useful. When an otherwise good section contains some weak particulars, I try to give a short warning without going into great detail.)

The Strong Points
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p 2, If we know beforehand that entities like cars and computers cannot develop without intention, then we are justified in concluding the prior existence of designers should we find cars and computers. Much of Mr. Dawkins' point in TBW will be that complicated biological entities can develop without intention, and therefore we are not justified in concluding from the evidence of their existence that a Designer exists. In a general sense, I agree that this is a sensible point; though I disagree when

it comes to particular attributes of particular biological
entities, which I think even Mr. Dawkins shows cannot be
the result of nonintentional reaction and counterreaction
(biological or otherwise. See Chapter 13 for details.) Note
that this good report softens what I consider to be
improper use of the car/computer analogy, as I list below
in the Cracks. Or, you can put this the other way around--
the improper usage listed below undercuts the strength of
this point.

p 3, An understanding and application of general principles
allows us to puzzle out which directions are viable and
which are not; thus allowing us to apply with better
efficiency the far more difficult and complicated
discussions of extremes (in size, complexity, or what-have-
you). I thoroughly agree with this; in fact, discovery and
application of the principles of theories grounds virtually
all of my logical belief in a supernaturalistic
Christianity! I don't think Mr. Dawkins has paid as much
attention to the implications of the principles of his own
theory as he should have; nor that he implements those
principles very fairly; nor that he represents the
principles of his opponents very cogently. But that's
beside the point here.

p 4 and following, Mr. Dawkins presents (here and
elsewhere, up through his 11th chapter) a decent refutation
of the Argument from Design as exemplified by Paley. I
think he overrelies on his success at refuting this weak
apologetic argument, but at the same time he deserves at
least a little credit for the success. He's correct to
refute it, and (usually) refutes it correctly. To that
extent, his refutal is indeed a contribution, as there may
be people who haven't seen it refuted. Although this
refutal isn't the earth-shattering news he seems to think
it is (very many expert supernaturalist theologians have
long refused to use the AfD as primary argumentation), the
fact is that theologians have been lax getting this news to
the nonprofessional churchgoer--if it takes an opponent to
get the news across, then it's a black mark on _our_
record, not a strike against our opponents.

p 7, Mr. Dawkins' discussion of the properties of
'uniqueness' has some merit. He doesn't use it very well,
even within the context of his own argument (noting that
the uniqueness of a lock exists because of the intent of
its designer seems an odd illustration in a book dedicated

to arguing _against_ a cosmic designer!). But taken by itself it's interesting and useful.

p 9 and following, Mr. Dawkins introduces and develops his discussion of replication ability as the distinguishing characteristic of 'living' objects. I thought this was (even as it stands) one of the strongest positions of his whole book, and capable of being even stronger if he didn't hamstring it constantly by trying to tie it through a convoluted series of vague definition-usage to 'simple' vs 'complex' objects; from there to a game-rigging defintion of cumulative step vs. single step events; and from there to a game-rigging redefintion of miracle as a vastly improbable natural event. Remove or (if possible) revamp all that, and reposition replication as the key process underlying any understanding of evolution, and I think he'd have a simpler, tighter, more effective biological argument.

pp 16-18, Mr. Dawkins gives us a nicely detailed account of the complexity of the (presumably human) eye.

p 22, I thought his theory about the development of mammalian physiology from nocturnal to diurnal had some merit, though he produced no reports of evidence to help confirm it. Pages 22-23 contain some generally well-thought out biology, I thought. On page 23 I learned that pandas are carnivorous, though I had thought they lived primarily on bamboo shoots. (I'm still not quite sure about that one, though perhaps he means the red pandas which look more like their raccoon relatives.)

pp 24-36, contain some good information about missle- and torpedo-seeker technology and their biological counterparts; particularly this section contains loads of good information about bats and echolocation. This was one of my favorite sections.

p 39, I agreed with Mr. Dawkins that "Even if the foremost authority in the world can't explain some remarkable biological phenomenon, this doesn't mean that it is inexplicable." However, I would change that slightly to say 'this doesn't _necessarily_ mean that it is inexplicable'-- it would depend on why the foremost authority in the world couldn't explain it. (i.e., can he not explain it because a fair explanation would require data which we don't have access to yet, or can he not explain it because the

position to be defended is inherently self-contradictory?)
Fair's fair, and I want my side to recognize that; but I
want the other side to recognize it as well.

pp 40-41, Mr. Dawkins concludes chapter 2 with what I
thought was a fair and useful description of the amount of
time evolutionists bring into play for their biological
theories. I don't think he _ultimately_ makes sensible use
of these swatches of time, but I thought he did a good job
here.

In the same place (end of chapter 2), I thought Mr. Dawkins
was right in his correction of the impression of
'randomness' which some of his adversaries have tried to
attach to evolutionary theory for purposes of discrediting
it. (We'll see this again in his final chapter.) I found
him to be seriously inconsistent at other places in his
uses of 'randomness', but at this point I thought he spoke
well in defense of his theory. (In fact, as I'll note
later, I generally thought he discussed 'randomness' best
when refuting some of my side's attempts at repositioning
biological evolutionary theory into something it's not!)

pp 46-48, Though I ultimately had some problems with his
interpretation of the experiment (and even used it against
some of his later arguments!), I thought the computer-
simulated monkey typing METHINKS IT IS LIKE A WEASEL was
pretty clever. Definitely something to keep for a revision,
though I think he will have to _revise_ it (not just port
it over whole.)

p 49, Mr. Dawkins makes yet another good point against
opponents who want to misuse probability estimates against
evolutionary theory, in this case opponents who treat
evolutionists as though they are defending single-step
processes rather than cumulative-step processes.

p 50, Despite some of his elegaic descriptions of how the
computer-monkey experiment illustrates the wondrous power
of "the blind forces of nature", Mr. Dawkins (to be fair)
temporarily qualifies himself here by noting that his
experiment is misleading because it worked toward a goal he
himself had given it (along with restriction, parameters
and instructions he'd given it too, but he doesn't mention
those.) Also, to be fair, Mr. Dawkins doesn't straight-out
claim in his monkey-example that the computer program
represents something other than a designed result (though

he sure leaves us open to draw that implication from his
parallel discussion on p 49 about cumulative-step
processes, after having just demonstrated one.) However, he
qualifies himself much better here than shortly afterwards
with the biomorphs.

pp 50-51, Parts of these pages give a good description of
the physical processes of cumulative-step selection as they
operate in biological entities. (They also, as it happens,
help ratify my interpretation of the computer-monkey
example, though Mr. Dawkins may not have intended _that_!)

pp 53-56, Here Mr. Dawkins gives (as far as I can tell) a
useful extended description of how genes work and they
affect the body.

pp 66-74, Mr. Dawkins illustrates the concept of multiple
'dimensions' in a useful and colorful way, particularly
with respect to cumulative-step processes. I had only one
or two problems within this section, none of which affected
the overall _biological_ lesson here.

pp 77-78, Mr. Dawkins discusses what he means by "walking a
large distance across animal space". It seems logically
correct to me, as far as it goes. It's another good
illustration of the principles of cumulative-step
selection.

pp 80-81, Mr. Dawkins (assuming he's presented their
argument fairly, which in hindsight I'm a bit leery about
accepting as an assumption) pretty thoroughly crushes a
misuse of possibility, probability and certainty from
Hitchings and Gould.

pp 82-83, Discounting a few minor blips, Mr. Dawkins
continues with a fairly good reply to Goldschmidt, though
it could be better (he disposes of some options with flat
assertion and no discussion of corroborating evidence).

pp 83-84, This reply, on the other hand, is much better; in
fact, it's one of the best pieces of writing in TBW, in my
opinion. Mr. Dawkins reminds us that there is no such thing
as a staic, standard 'situation' where a predator sees a
potential meal; and works out the implications of this
concept within the contentions of biological evolutionary
theory.

pp 84-86, These pages contain a good discussion on the implications of mutation and embryology, with respect to the nautilus. p 86 also contains a worthwhile discussion of some more misused "anti-evolution propaganda", as he calls it.

pp 86-87, This is the amusing bombadier-beetle refutational example/experiment, against Hitching's _The Neck of the Giraffe_.

pp 87-89, Setting aside a few peculiar (and fairly minor) gaffes, this is the extremely useful refutation against the 'what use is half-a-lung' argument.

pp 89-92, Just more good biology-in-general; including air-bladders in water-going animals (for buoyancy), and the tracing of the development of wings from skin.

pp 92-109, Ignoring some ethical inconsistencies with the contentions of his own theory, some anti-creationist propaganda (no Designer would create something as "monstrous" as a flatfish, though an objective definition of "monstrous" that would serve this assertion is lacking), and similar bon mots; this section finishes out Chapter 4 with a discussion about trends in 'genetic space'--parallel evolution, for instance, or reversal of general trends. This section also contains a good technical description of how fish electrosense their environments (particularly in muddy river waters) on pp 98-99.

p 111, Mr. Dawkins uses a very clever and colorful metaphor involving trees raining 'programs' or 'algorhythms'.

p 113-114, Mr. Dawkins presents a good argument concerning how simple examination of data confirms that inherited blending doesn't take place (at least not in the way pre-Darwinians and early anti-Darwinians envisioned it.)

pp 114-119, Mr. Dawkins discusses genetic information storage. Several goofs (at least one of them very serious), but nothing impinging on the actual progression of the _argument_ itself, at this point. Mostly better-than-average textbook-style writing. The use of the New Testament as a data-storage example is funny (though a bit cloying taken in context with the general tone of TBW), and I particularly liked his clever rephrase of the old "How many angels can dance on the head of a pin" question.

pp 119-123, More good work with very few gaffes, this time comparing genetic information storage with RAM and ROM.

p 128, The use of Ezekiel's vision of dry bones clothing themselves is a clever analogy to primordial biological (or pre-biological) processes leading to self-replicating compounds.

pp 130-131, He provides more good examples of the basic processes of genetic replication, though he slips and calls virus "devilish" (apparently forgetting that their behaviors don't really strip humans of any real dignity, nor violate any real sacredness of human life--those concepts being merely unquestioned speciesist assumptions!)

pp 131-134, some good descriptions of the behaviors of RNA, including the results of the Eigen group's RNA-growing experiment.

pp 135-136, This is the nicely detailed analysis of the direct chain of cause and effect from result of a chemical misprint in gene replication to the eventual spread of that gene throughout the gene pool of a species of beavers, resulting in a better-built dam. I liked this example so much that I used it myself in several places to expose some weaknesses in _other_ parts of Mr. Dawkins book!

p 140, Mr. Dawkins takes some effort to detail a potential problem for his theory: "[W]e cannot escape the need to postulate a _single-step_ chance event in the origin of cumulative selection itself." [italics his]

p 141, For what it's worth, Mr. Dawkins offers up yet another fairly good argument against using the Argument from Design (AfD) as a primary tool in theistic apologetics.

pp 142-143, In a (relatively rare) burst of fairness, Mr. Dawkins illustrates perfectly well that he cannot logically use a position based purely on assumption to help his argument--in this case, the position that life must almost certainly exist elsewhere in the universe 'because' there are 'probably' 100 billion billion planets and the emergence of life on this one planet doesn't 'seem' quite _that_ improbable. Rather than use this position, he explicitly sets it aside to try another tactic.

p 143, In a similar vein, Mr. Dawkins refutes a position
which relies purely on emotive perception for its strength;
he clearly sees that "empty rhetoric" about backwaters does
not lend strength to the position 'there must be other life
in the universe'. Ironically, as I'll point out in the list
below, TBW is nevertheless quite ripe with positions which
similarly depend entirely on emotionalistic appeals and
presumed conclusions. However, fair is fair: he did tag
these two!

pp 149-157, Despite a few serious problems with
interpretation of conclusions here and there, Mr. Dawkins
produces a nice, detailed summary of Cairns-Smith's
silicoid replicator theory in this section.

p 165, A quick but probably sufficiently thorough defense
against the lack of laboratory success in reproducing
spontaneous formation of life. Mr. Dawkins points out that
we really don't know what the proper environmental
conditions were at that time; and that even if we hit upon
the right combination the odds that it would actually
happen are so low that it would be surprising if a lab
did succeed in reproducing the effect. As Mr. Dawkins
points out, none of this means that it _didn't_ happen; so
the lack of success cannot be fairly held against the
theory (a conclusion which, unfortunately, I see my allies
trying all the time.)

pp 169-179, The beginning of a relatively good chapter on
"arms races", starting with some grounding discussion
concerning how genes respond to one another in their
microenvironment. This section also includes Mr. Dawkins'
fragmented hard-drive analogy; informative discussion about
dormant genes and the rise of eukaryotic cells (i.e. any
non-bacterial cell); a tidy little discussion on the
effects of inorganic environmental pressures on evolution;
and, of course, plenty of the cool 'arms-race' analogy.
(Not that there aren't some minor 'plonks' here and there,
but I covered those in my detailed analysis.)

pp 181-182, Mr. Dawkins forestalls some misunderstandings
by qualifying himself regarding the 'arms-race' anaolgy.
One of the qualifiers relies a bit on chronological
snobbery for its strength, and he seems to fudge a little
in his discussion about 'progressive improvement' but
otherwise the three qualifications seem to work well.

pp 184-187, The clever Red Queen concept is discussed; some parts of which are so good I end up using them _against_ other parts of Mr. Dawkins' argument! Included in this section is the fun and useful analogy with real human arms races, specifically missle systems vs. guidance jammers.

pp 188-190, An extremely interesting look at the Encephalization Quotient, as used by Harry Jerison.

pp 190-191, Mr. Dawkins discusses limits to arms-race development; his fox and rabbit analogy doesn't _quite_ represent the point he's trying to make, but it's not hard to figure out a slight extension to the analogy which allows it to represent his point better.

pp 195-196, In a useful (and slightly humorous) prelude to his eighth chapter, Mr. Dawkins discusses analogies; and cautions us readers that the topic of that particular chapter may or may not be helpful to us; and if not, to leave it alone (thus fairly qualifying himself.)

pp 196-198, This is the section where Mr. Dawkins introduces the concept of positive and negative feedback loops, which he illustrates fairly well using two good examples. (His Scriptural example is also clever, as far as it goes, though the way he leaves it hanging invites readers not familiar with the contexts to attribute unfairness to Jesus, the speaker of the line Mr. Dawkins uses.)

pp 200-206, Mr. Dawkins presents some well-thought out ideas from Charles Darwin's theories of natural selection; specifically that selection need not necessarily entail better _survival_ capability (in terms of the individual.) Mr. Dawkins uses R.A. Fisher's African widow-bird example to bolster this section. This was one of my very favorite sections of TBW.

pp 208-212, More good widow-bird discussion, as Mr. Dawkins introduces and examines the concept of a balancing series of constraints in male widow-bird tail development. (I do have one caveat about his use of the term 'choice discrepancy', though, taken in context with the rest of his work here and elsewhere. 'Taste discrepency' seems a safer and more accurate term, to me.) Mr. Dawkins even indulges in a bit of self-conscious criticism on the possibility

that the Lande/Fisher widow-bird theory might be circular
in character; whereupon he suggests a clever alternative
theory from Alan Grafen and W.D. Hamilton (which happens to
fit in nicely with positive feedback development loops, the
balancing equilibria line, and a competitive arms race
factor.)

pp 213-214, Mr. Dawkins cogently summarizes the experiments
of Malte Andersson involving male African widow-birds,
which provide a certain amount of verification to the
Lande/Fisher theory. (Mr. Dawkins also plays fair here and
qualifies how far the experiment can be taken.)

p 225, Mr. Dawkins scores a valid point against the
contention that biological evolutionary theory is an
unfalsifiable tautology.

pp 227-228, Mr. Dawkins skillfully begins distinguishing
between cariacturized gradualists and real gradualists, in
order to defuse a line of argumentation against biological
evolutionary theory.

pp 229-232, Although he intends to eventually argue against
punctuationism, Mr. Dawkins takes the time to defend the
theory (as far as he can) by removing several
misunderstandings.

p 234, Mr. Dawkins notes that older, simplistic attempts to
refute evolutionism (like Sir Fred Hoyle's) actually ended
up arguing against saltationism instead.

p 238-240, Mr. Dawkins goes to some trouble to detail a
working example of 'speciation'; particularly in terms of
punctuationist interpretation. It's so good, in fact, that
I refer back to it later when I charge Mr. Dawkins of
selectively misrepresenting what the punctuationists are
claiming (since they build their theory off of orthodox
speciation theories.)

p 242, Mr. Dawkins again points out that 'constant
evolutionary speedism' is not orthodox gradualism and so
arguments designed explicitly against c.e.speedism would
not work against the orthodox theory.

p 244, Mr. Dawkins engages in a clever bit of textual
criticism to defuse a punctionationist's claims about
Darwin.

p 250, Mr. Dawkins shows again how Eldredge and Gould
(assuming we can trust his presentation of their views)
have managed to position themselves as anti-Darwinians. He
then highlights the illegitimacy and unfairness of this
process.

pp 256-259, Mr. Dawkins begins his discussions on taxanomy.
Aside from a few minor blurbs (which didn't harm his
discussion at this point, as far as I could see), he pretty
fairly distinguishes between systems with no correct
classification scheme, and systems (notably gradualistic
evolution) which must have one correct classification
scheme--in terms of development, at least. His 'perfect
nesting' concept was particularly well thought-out.

p 261, Mr. Dawkins calls for some fair-play from
creationistic opponents who would misrepresent gradualistic
Darwinism as predicting "grotesque chimeras" like a dog
with a horse's hindquarters. That's not what the
Darwninists predict.

p 261, Mr. Dawkins also begins his thorough qualification
of his assertion that there can be only one true gradualist
taxonomy. This helps explain why some later difficulties in
taxonomic studies arise. (The point being that we would
expect such problems in _any_ case, and so the problems
cannot be used to argue against biological evolutionary
theory.)

pp 264-265, Mr. Dawkins colorfully and usefully summarizes
the differences in viewpoint bewteen punctuationists and
gradualists, by comparing the sort of 'main characters'
each sort of scientist would emphasize if they were writing
a 'story' based on evolutionary development. (Species for
the punctuationists, individuals for the orthodox
gradualists.)

pp 265-269, Mr. Dawkins discusses the implications of
'species selection' theory; specifically what it can and
cannot account for in terms of species _development_.
(Note: he makes a rather massive misstep regarding
"apparent altruism", but it doesn't really affect the
particular argument at hand here.)

pp 270-274, Mr. Dawkins well-describes how the common
genetic 'language' of Earth's lifeforms, and the sort of

proteins this language generates, allows us to determine
with a fairly high degree of accuracy how closely 'related'
any species is with any other.

pp 277-278, Mr. Dawkins illustrates (quite literally,
actually, in an effective little demonstration) how three
different animals--squid, herring and human--could be
imagined in terms of relationship.

pp 280-281, Mr. Dawkins gives what may be his fairest and
best summary position of one of the 'sides' in the debate:
the pheneticists (or 'numerical taxonomists', or as he
calls them, the 'average-distance measurers'.) He manages
to avoid "pejorative" labels; grants that they have some
good points; and generally respects their methodologies and
motives, despite the fact that he disagrees that their
methodologies are necessary (because no one is "seriously
in doubt about the truth of evolution", p 276!)

pp 282-284, Mr. Dawkins provides a fairly good biological
argument against "transformed cladism" (though he tips his
hand moments later by dismissing their philosophical
grounding out of hand with no debate.) His lambasting of
creationistic opponents who try to use a faulty-logic
conclusion of transformed cladism to bolster our side, is
also well-put.

p 287, Skipping past Mr. Dawkins' de rigure opening barb
regarding "serious biologists", he pretty well summarizes
his overall targets for his last chapter, explaining why
he's put them into this particular category (_and_
explaining why previous oppositional/alternative theories
were included in _other_ chapters).

pp 294-298, Mr. Dawkins (assuming we can trust his
representation of ideas by this point) gives us a good
breakdown of modern (and ancient) preformation theories. Of
particular use are some of his analogies where he compares
and contrasts genetic preformation with epigenesis in a
fairly-easy-to-see way: the making of a cake.

pp 299-300, Despite overextending an analogy, Mr. Dawkins
provides a neat principle refutation of development through
acquired characteristics by pointing out that damage to the
body is also an acquired characteristic; yet our bodies
don't appear to be starting with permanently broken bones,

etc. (even if those bones happened to be set or otherwise functioning properly at the getgo.)

pp 303-304, Aside from yet another shuffle of the meaning of the term 'random' (this time standing in for 'inefficient'), Mr. Dawkins pretty clearly explains why neutralism should not be considered a rival to Darwinism. (In fact, the two theories may well be complimentary, though dealing with somewhat different topics.)

pp 306-312, Mr. Dawkins provides a pretty good discussion of types of 'randomness', though it suffers by the quietly selective Argument from Exclusion tactics he's been employing since back on page 7 (as well as suffering from the Argument from Chronological Snobbishness, and a few other things). Of particular note and usefulness is his well-constructed reply to a class of opponents who try to redefine the evolutionist's position to mean "_All_ changes are held to be possible and all _equally likely_."

So, after all's said and done, out of 318 full pages of material taken from the main body of _The Blind Watchmaker_, I thought 204 of those pages (or 64%) had above-average material, in terms of usefullness, good argumentation, particularly high aesthetic quality, etc. And remember that this doesn't mean that I'm throwing the remaining 114 pages into the food disposal. As far as I'm concerned, those pages contain some true and useful material as well; just of more average quality. But, at the same time (as I hint at above), even the _good_ stuff often contains some serious problems; and the remaining 114 pages often contain massive problems.

In order to put the concluding half of this chapter in perspective, let me remind you, the reader, of some of Mr. Dawkins' own commentary about TBW from his Introduction to the 1996 edition:

p ix, "I have been asked to provide a new introduction for this reissue of _The Blind Watchmaker_. I thought the task would be easy. All I had to do was list the ways--there surely had to be many--in which I should reform the book if I were writing it again today. Eagerly, chapter by chapter, I scanned for errors, misguidednesses, out-of-datednesses, incompletenesses. [sic] I genuinely wanted to find them, for science--whatever the frailties of its individual practitioners--is not naturally complacent and pays lip

service to the ideal of progress through falsification. But, alas, details aside, I can find no major thesis in these chapters that I would withdraw, nothing to justify the satisfying catharsis of a good recant."

This is not to say, of course, that in the intervening ten years between the original publication of TBW and the 1996 edition (which I've just perused), Mr. Dawkins has not been exposed to some material which, were he writing TBW over again, he would include reference to: he provides a list of them (as further reading for his readers) on p x. However, nothing written in those books apparently convinced him that he had some problems (ranging from trivial to gigantic) from the first edition that needed correcting. Indeed, the impression he gives the readers is that, if anything, he would have simply used them to _further_ emphasize the points he makes--or attempts to make--in TBW.

That being the case, I think that from his own testimony we can fairly say that he has had a very fair chance to revise portions of TBW through critical (and self-critical) analysis. And, in my opinion, he blew it.

For the sake of providing Mr. Dawkins a future chance at some "satisfying catharsis" (if nothing else), allow me to present, in the following list, as many of the Cracks of Doom as I could gather from a pervasive read-through of my notes.

Although I intend the summary of errors or faults to be inclusive, I will try to be as nonrepetitive as possible. So, for instance, while it may appear that a particular chapter hasn't many errors, or many serious ones (because its page numbers aren't used often in the following list), this may actually reflect the propagation of errors _similar to_ ones which I've already accounted for. That's why I have eleven previous chapters; to follow the argument in detail. I'm not summarizing the chapters here; I'm summarizing the _sort_ of errors which the whole book contains. Also, some of the positions taken below by Mr. Dawkins exhibit more than one type of error category.

The Cracks

Straw Men Burning

A.) Mr. Dawkins focuses on the (admittedly) wimpy general
telelogical arguments (aka the Argument from Design or AfD,
as exemplified by William Paley in his _Natural Theology_),
to the rather noticeable exclusion of other far more recent
and (to my mind, at least) devestating apologetic tools
developed in the last century as a direct response to
theories of human behavior based on naturalism,
philosophical evolutionism, and biological evolutionary
theory. (Note: this is despite Mr. Dawkins' own comments in
his 1996 Introduction: "[I]t is still true that anybody
tempted by the arguments of creationists will find
definitive refutations of them--I think _all_ of them--in
here." p x, italics his) Given Mr. Dawkins' field of
expertise, he would have been better engaged in responding
to those theories rather than to the worn-out, circular
AfD. Such a tactic smacks of irresponsibility, even if it
was aimed purely at the "naive" "backwoodsmen" who might be
presumed to know only the AfD at best. More to the point, I
can easily guess Mr. Dawkins' own reply to a creationist
who argues against modern evolutionary theory by setting up
a useless variant which just happens to be popular among
the naive and ignorant. In fact, I don't need to guess at
all, because Mr. Dawkins gives us his own opinion of such a
tactic in his own words at several places in TBW.
Meanwhile, a mention of the naive backwoodsmen brings me
to...

B.) Mr. Dawkins consistently cariacturizes modern theists
as naive backwoodsmen, or words to that effect. Even when
he allows the existence of "educated bishops", his
presentation strongly implies that they invariably hang
their whole point on the same naive backwards-thinking
arguments used by the yokels.

C.) Speaking of yokels, Mr. Dawkins wishes us to discount
ideas of reality which can be traced back to the "ancient
Middle-Eastern tribesmen" of the Bible. The implication is
that theists have no better arguments today than the
tribesmen did. I happen to know this is patently untrue,
but the reader would never guess it from TBW. This either
bespeaks of more irresponsible ignorance about the
opposition, or a fear of going up against the heavyweights.
Either way, the public can hardly be said to have been
served in the cause for spreading the truth, even if Mr.
Dawkins' final conclusions happened to be correct, by
avoiding the recent arguments which don't use tribesmen
methodologies!

Points B and C above also exhibit game-rigging (and general misrepresentation) tendencies which I'll explore in a separate category below. The point for this group is not to consider the extent to which his portrait of these theists can be considered fair or unfair; but that even if they _were_ fair, picking on _those_ particular straw men hardly counts as a ringing refutation of "I think _all_" theistic arguments by which someone "might be tempted" to accept some form of supernatural creationism.

6=16 Positions

A.) Mr. Dawkins becomes upset when lobsters are boiled alive, and is even prepared to get worked up about it ahead of time (in his nonprofessional life), despite his later assertions that animals are unconscious, automatic biological machines. Lobsters, we may thus conclude, are really capable of conscious suffering, but are really unconscious biological machines.

B.) Mr. Dawkins knows perfectly well that he cannot introduce something other than physical laws (he makes abundantly clear near the bottom of page 10 that doing so lets in supernatural force, or the "life-force", or something of that ilk); yet the sort of work accomplished by 'higher' organisms (like, presumably, himself when he wrote TBW) must be considered to be qualitatively different in some basic fashion from the sort of 'work' done by, for instance, a protein molecule. The second kind of work is describable by physics in terms of mass multiplied by accelleration multiplied by physical distance moved. Mr. Dawkins' authoring of TBW can, of course, be described (in theory at least) in these sorts of terms, expressed by additive vectors perhaps; but the logical grounds of his argument as such are not qualitatively expressible in those terms. In other words, the physical behaviors which comprise Mr. Dawkins' composition of TBW may be described (in principle) by physics relations; but the application of the logical law of noncontradiction or the rejection of a circular theory (for instance, rejection of the Argument from Design) are not reducible or expressible in terms of physical movement--at least not without destroying the presumed rationality of the exercise. Attempting to express such issues as the product of ultimately nonrational physical movements explains _away_ their existence as

'arguments'. But a philosophical naturalist, like Mr.
Dawkins, claims that the physical universe is all that
exists and that it is ultimately nonsentient (against
theism and pantheism.) His own argument must thus be
explainable (not merely describable) in principle (if only
we could trace the complexities) as the reaction and
counterreaction of nonsentient physical entities according
to nonsentient physical relationships between those
particles (be they influenced by equally nonsentient
quantum behavior or not.) Yet it must also be the product
of an entity, composite or otherwise (i.e., he himself),
which is sufficiently free of natural causation that the
argument may be judged on its own merits as something
qualifiably _other_ than a set of physical movements within
his brain; and these presumed judges (including himself
self-reflectively, and us as his readers) must themselves
be sufficiently free from nonrational causation to render a
potentially valid estimate of his argument's success or
failure. (You will notice that Mr. Dawkins and/or his
publishers did not bother getting positive recommendations
of his book from the inmates of an insane asylum, whom most
of us consider to be clearly so _irrational_ as to impair
the validity and trustworthiness of their judgements!) Mr.
Dawkins' 'work' must be, at bottom, the 'work' of
nonrational physics and nothing else; yet it must also be
something thoroughly _different from_ such 'work'.

C.) Mr. Dawkins gets bored when people talk about something
being _more_ than the sum of its parts, and annoyed when
people talk about it being _only_ the sum of the parts. (pp
12-13) In fact, he's quite willing to switch back and forth
between the two principles in an exclusive manner whenever
it benefits the flow of his attempted argument. Given his
remarks about the character of written literature (and the
reflective implications of his remarks for the literature's
author), we may conclude that as an author a biological
entity (such as Shakespeare, or Mr. Dawkins himself) is
really more than the sum of his physical parts; but
(according to Mr. Dawkins' presentation of evolutionary
theory) as a biological entity the author is _really only_
the sum of his physical parts.

D.) On page 14 we are told that the "fundamental original
units" which we must postulate "in order to understand the
coming into existence of everything" are either "literally
nothing"(!), or are "units of the utmost complexity, far
too simple to need anything so grand as deliberate

Creation." The concept that 'x' can be so complex that it's
too simple to need anything "so grand" as 'y' to exist,
makes me laugh uproariously every time I read it. The fact
that TBW has received numerous _literary!_ awards while
containing that sentence thoroughly boggles my mind. At any
rate, the 6=16 paradigm is abundantly clear here: those
"fundamental units" must really be extremely complex, but
they must also really be extremely simple.

E.) Mr. Dawkins switches back and forth with little warning
between a concept of design without intent (which frankly
is an oxymoron) and design with intent. Thus, for instance,
"We... shall conclude that, when it comes to complexity and
beauty of design, Paley [the advocate of an ultimate
Designer] hardly even began to state the case," (p 21), yet
this design, according to Mr. Dawkins, isn't _really_
design. More to the point, I think we may conclude that Mr.
Dawkins considers his own argument in TBW to be well-
designed; yet it must (under his philosophy) be ultimately
the result of the non-intentional interaction of physical
entities which cannot actually 'design' anything. Design
must really exist, but it must really be something other
than design.

F.) After describing the sort of "non-randomness" which
even a simple sieving process provides, Mr. Dawkins states
two paragraphs later (p 44) that simple sieving would be
the equivalent to the sheer luck of a purely random jumble.
In other words, sieving must really be capable of providing
'ordering'; but it must not really be capable of providing
'ordering'.

G.) The functional difference between the single-step and
the cumulative-step Shakespearean monkeys illustrates even
more clearly than _I_ could, that when Mr. Dawkins assigns
the label of 'single-step product' to a cloud (or the solar
system, or Mount Blanc) he either is _really_ using another
means of distinction from the one he _claims_ he's using
(since compared to the monkey example all these entities
would also be cumulative-step), or he's arbitrarily
switching his defintions as he feels like it to keep the
argument going. In other words, Mont Blanc must _really_ be
a product of a single-step process; but it must really
not be a product of a single-step process.

H.) Mr. Dawkins admits that his biomorphic program gets its
results because he chooses the shapes--he even admits that

if we used a pattern recognition computer program instead
of a 'by-eye' method, we would still be the ones setting
the parameters, and so in principle the program would not
reflect automatic, unintended natural selection processes.
This didn't stop him from rhapsodizing about how those
little insect-monsters were "undesigned and unpredictable"
(middle of page 60.) In other words, the insect biomorphs
must have been really undesigned and unpredictable, but
they must have really been the result of his own
intentional efforts (_as opposed to_ 'real' natural
selection processes which are undesigned and reach
unintended results.)

I.) Mr. Dawkins admits, and even insists on, a real
distinction between "artificial" and "natural" processes
(for instance, he admits that his biomorphic process is
actually artificial, as opposed to natural, because he
intentionally interferes with it to produce his results.)
However, he also insists that he himself is completely a
product of blind, automatic, nonintentional natural
processes; put another way, he would deny that there is any
supernatural characteristic about himself for the simple
reason that there is no such thing as a supernature, nature
being everything (i.e., a one-level reality.) In other
words, at least some of his behaviors must _really_ be
"artificial" _as opposed to_ "natural"; but they must all
really be "natural" _and nothing but_ "natural".

J.) Mr. Dawkins claims that truly creative processes exist,
and that working our way to a target in biomorph land
really is a truly creative process; but it only feels like
a creative process, because what we are _really_ doing is
finding the creature. (p 65) Real creativity exists, but
it really is something else.

K.) Mr. Dawkins, at many different points in TBW, implies
heavily that ethical codes are human inventions with no
overarching objective weight; that ethical behaviors are
genetic artifacts which happen to benefit the survival of
individuals and/or the species (for example, I love my
brother because genes which produce such feelings of
affection in me toward close relatives will, on average,
have a higher probability of spreading themselves through
the gene pool); and that such concepts as "_human rights_,
human dignity, and the sacredness of _human_ life" (p
114, his italics) are unquestioned speciesist assumptions.
On the other hand, he apparently believes in real human

responsibility toward each other, and toward other natural
entities. For example, it apparently doesn't occur to him
that his opinions about the mistreatment of Australian
aborigines are themselves unquestioned speciest assumptions
about the sort of respect they (as humans) _deserve_. Or
again, when he asserts that people deserve to know the
truth (whereupon he indicts 'creationists' for spreading
falsehoods), it apparently doesn't occur to him that he has
unquestioningly adopted one of those speciesist assumptions
of 'human rights'--namely, that people really do _deserve
to know the truth_. On the contrary, he treats these sorts
of ideals as if they were _not_ merely speciest assumptions
which he just happens to be exhibiting. He treats those
opinions as if he were objectively perceiving and reporting
something independent of human whim (i.e., they don't just
depend on _his_ aesthetic taste, or the combined average
aesthetic taste of humanity in general, which may change in
50 years), and as if they were not reducible to non-moral
behaviours. More to the point, he expects _us_ to accept
such positions _as truly ethical_ positions--as positions
which are what they claim to be. He apparently doesn't
expect us to treat his opinions merely as facts about
himself, in which case his passion would be at best merely
comical. (Hey, look, Mr. Dawkins is venting about the
thalycides again!) In other words, an ethical judgment must
really be (or at least potentially be) a perception of an
objective moral truth; but it must really not be a
perception of an objective moral truth (even potentially.)

L.) Mr. Dawkins goes to some trouble (near the end of
Chapter 6) to illustrate that, if we happen to have a
subjective impression that a theory is not a "good bet",
this provides us no grounds for rejecting that theory. He
illustrates this by detailing how natural development tends
to instill subjective perceptions of 'probability' in
creatures; and continues by demonstrating that these
subjective impressions are not valid data upon which to
base conclusions about accepting or rejecting a theory
(even if the impressions happen to reflect actual reality).
Nevertheless, Mr. Dawkins claims throughout TBW (including
a few times right at this spot) that _he_ can form
objective and (at least) potentially valid probability
estimates--and he provides absolutely no means (in TBW,
anyway) for the emergence of this ability from nature. In
other words, nature apparently must only be able to provide
the ability to subjectively estimate probability, but
nature apparently must also be able to provide the ability

to objectively estimate probability (since Mr. Dawkins must
be purely a product of natural events.)

M.) Perhaps working out some ideas from his book _The
Selfish Gene_ (and combining several of the 6=16 categories
already listed above), Mr. Dawkins would have us accept
that an individual can really 'choose' (say, a widow-bird
choosing a mate), but that it is really the nonrational
influence of genetic pressure _making_ her do the
'choosing'. That is, choice really exists, but it isn't
really choice. (The widow-bird example is on p 209.)

N.) Late in TBW, Mr. Dawkins briefly touches on the topic
of 'learning' for purposes of illustrating Darwinism's
superiority to Lamarckism. During this attempt, he states
that an animal 'learns' and can initiate 'actions'; even
though everywhere else the same sort of animal is described
by Mr. Dawkins as an unconscious _automatic_ biological
machine. By playing fast and loose with the terminology,
Mr. Dawkins leaves the reader with the impression that
evolution must really provide real learning and initiative
in animals; but that what it provides must really be
something other than real learning and initiative.

Circular Argumentation

A.) Cars and computers are allowed to count as real
evidence for designers because of their obvious 'design';
but their strength as evidence relies on our knowing
already that such things must be designed. (p 2)

B.) Mr. Dawkins presumes, as the necessary condition for
any process he's discussing, that there _must not_ be
anything other than physical laws at work in nature. Yet
the point of TBW is supposed to be that he's arguing _to_
that conclusion, not requiring it as a precondition for
analysis of the data. This flat presumption includes a
routine denial of God's existence as a prerequisite for
analysing any data (not as a conclusion drawn _from_
analysis, despite what the subtitle of TBW implies to the
prospective reader.) This sort of thing happens pretty
consistently throughout the entire book, and probably
represents the chief circular argument of TBW. The earliest
example seems to be page 8: Mr. Dawkins' definition of
relative complexity, which he intends to use as part of an
argument against the existence of God (he intends to

'reveal' a universe that has no designer, according to his subtitle), requires as a necessary premise that God not exist.

C.) Mr. Dawkins' argument includes this overarching strategy (among others): he hammers on plausibility and probability, which requires the possibility to be presumed to even work. Then later he discusses possibility-issues and bolsters their strength by using their high (or higher) probability as a support for accepting their possibility. Aside from being circular, it's also just generally bad argumentative methodology: possibility-issues should be discussed first, and _then_ probability issues. (Remember the example of whether my brother has won the Tennessee State Lottery: the _first_ question is, 'Do we even _have_ a Tennessee State Lottery?')

D.) Mr. Dawkins himself admits (finally) that if he assumes evolution throughout the _doing_ of his taxonomy, he can't then use the results of his taxonomic work to support the truth of evolution: the argument would be circular. However, his attempt to escape this dilemma ("This argument would have force if anybody was seriously in doubt about the truth of evolution") merely reinstates the circularity one stage further back. In other words, his acknowledgement about the circularity of his strategy makes no problem if evolution happens to be true to begin with; therefore, he can use it to help convince people that evolution is true. This reminds me of the 'glorious circularity' used by Reformed Presuppositionalists, though I doubt Mr. Dawkins would appreciate the comparison (or accept their conclusions.)

Use of Argument from Design Methodologies, (or similar Appeals to Nature's Magnificence)

A.) The complexity and obvious design of cars and computers are allowed to count as good evidence for the existence of 'designers'. (p 2) Complexity and design are the only two features counting as evidence here.

B.) Mr. Dawkins' use of the human eye as an example of "the sheer hugeness of biological complexity and the beauty and elegance of biological design" (p 15), which any theory of creation and/or development will have to account for, veers dangerously toward a purely emotional appeal. By itself I

wouldn't consider it particularly problematic--it does
present a general bar over which his theory will have to be
capable of vaulting, so to speak--but we learn a few pages
later that part of his tactic in such descriptions is to
increase our awe prior to explaining the solution (also
refer to page xiii, in his Preface, near the bottom of the
page.) Worse, the thing he's supposed to be increasing our
awe of, is a "veil of illusion" (it only _seems_ to be
well-designed, it's actually not designed at all.)

C.) Mr. Dawkins occasionally (particularly in early
chapters) will assert something to the effect that
"[L]iving things are... too beautifully 'designed' to have
come into existence by chance." (p 43 as an example) He
uses this as grounds for suggesting that we are justified
in looking for an answer to the existence of living things
which does not rely on 'chance'. Except for the very
different concepts of what it means for something to have
not developed 'by chance', this is equivalent to a
religious use of the Argument from Design (merely plug in
your own definition of 'not by chance'.)

D.) One way of stating a fallacious Argument from Design
would be thus: assuming that God exists and is omnipotent
and omniscient, and assuming that He designed and created
human beings (by any sort of method), is it _plausible_
that our eyes would work sufficiently well? The answer is
'Of course'. Our eyes do in fact work sufficiently well;
therefore the prior assumptions may be considered to be
verified as true. Mr. Dawkins and I would both agree that
this argument cannot lend justificational strength to
theism. However, Mr. Dawkins goes on to use a principly
identical argument (in Chapter 4) to lend apparent strength
to _his_ contention!

Game-Rigging Definitions (and general misrepresentations)

A.) Biological entities are complicated; physics studies
simple things (says Mr. Dawkins). "We" are only "tempted"
to invoke design for biological entities, not other
physical entities. (p 1) This just flat ignores huge
swatches of theistic (even polytheistic) thought throughout
the millenia, reducing theistic claims to what he probably
considers to be a 'manageable' state.

B.) In an almost sublime display of ignorance about his
opposition, Mr. Dawkins insists that the creation story in

Genesis has no qualitative differences from other ancient
creation stories. He doesn't even give any specific
arguments or details for this blanket assertion.
Recognizing some real differences need not even entail
accepting its story as being 'true'; his tactic here merely
reflects a general Appeal to Snobbishness found throughout
TBW, plus a staunch refusal to allow any real credit to
ancient thinkers (or adherents of 'ancient' ideas). This
brings me to...

C.) Mr. Dawkins betrays a constant bias against any set of
ideas with a long influence on our history, in favor of
supposedly 'modern' ideas. I thought one of the most
amazing examples of this was his casual disregard for
ancient thinkers who believed that the principle building
blocks of life were 'warm breath', fire or electricity--
when the 'blocks of information' _he_ suggests as a
replacement image depend specifically on warmth, gases and
electricity at fundamental levels! However, perhaps more
telling is his constant implication that theism is a
"woolly" outdated belief rendered obsolete by modern
atheism--despite the fact that the philosophy of non-
sentient mechanistic materialism which underlies any modern
atheism can be traced back at least as far as Democritus in
the millenia _before_ Christianity! The view of reality as
a non-sentient machine running without setup or
interference from God or the gods is as old as (or older
than) any currently surviving religion--possibly excluding
pantheism, which also has deep historical roots. Monotheism
is a relatively recent development compared to either of
its main competitors. (Unless, of course, Genesis is
literally true, which I'm guessing Mr. Dawkins denies!) All
three main branches of philosophy have undergone
modifications and improvements since their inception--
modern atheistic arguments work better (as far as they go)
than Democritus', for instance. But this is also true for
monotheism. (And I'm willing to bet it's true for
pantheism, too.)

D.) As part of this bias, Mr. Dawkins wishes us to
generally discount any beliefs of "ancient Middle-Eastern
tribesmen" as erroneous and irrevelant, (apparently because
we are not ancient Middle-Eastern tribesmen) despite the
widespread contributions to ethics and legality those
tribemen handed down to our generation--traditions of
ethics and legality which Mr. Dawkins can be shown to still
adhere to, rather vehemently at times! For instance, Mr.

Dawkins can thank those tribesmen (and the people influenced by those tribesmen) that he cannot be forced by the American government (and some others as well) to be legally incriminated by his own self-testimony. Similarly, Mr. Dawkins labels the geocentrism of the Middle Ages "absurd presumptiousness", despite the fact that _at the time_ the theory fit cleanly into the accepted philosophies of the day and gelled with the only observable facts. (Calling it _presumptiousness_ also ignores the fact that the centrality of the Earth in medieval Western cosmology was not considered to confer special privilage on the Earth, but to represent a particular _demerit_. 'Crap runs downhill' might be considered the philosophical principle underlying geocentrism.)

E.) Mr. Dawkins suggests that a complex thing has constituent parts arranged in such a way that it is unlikely to have arisen by chance alone. At first glance this seems like a sensible definition (it may even be sufficiently revisable), but the vagueness of the defintion becomes apparent if we ask whether something like Mount Blanc (one of Mr. Dawkins' early examples of a 'simple' object) arose "by chance alone". If "by chance alone" he means 'no intent', then it _and_ the 'complex' object arose by chance alone (as far as Mr. Dawkins would be concerned, anyway, as an atheist). If "by chance alone" he means 'no characteristics determined by a process of interaction with the properties of other entities (even if merely physical entities)', then _neither_ Mount Blanc (as a 'simple' object) _nor_ the 'complex' object arose by chance alone. And Mr. Dawkins is not very clear about his defintion of "by chance alone"--mainly he switches back and forth between these two definitions and merely asserts through force of rhetoric that there is a qualitative difference between 'simple' and 'complex' objects at this level.

F.) Mr. Dawkins hangs a lot of his argument on the distinction between replicators and non-replicators. In and of itself, I agree this is a good point; however, he forces a fallacious parallel distinction between chance and non-chance events (compared to non-replicator and replicator events respectively) to forge an eventual link to his convenient (and illegitimate) redefinition of 'miracle'. I think he could greatly strengthen his early discussion of the biology by rebuilding the argument from the ground up in terms of replicator vs. non-replicator; but I think he

would then have an even more difficult time trying to make the discussion serve his philosophical agenda.

G.) Mr. Dawkins tends to switch back and forth between a loose definition of 'specifiable in advance' (e.g., when he's talking about how complex objects have properties specifiable in advance, which under his own theory can't be literally true) and a strict definition of the same (e.g., when he's asserting that Mont Blanc's properties were _not_ specified in advance--in other words, there was no Specifier/Designer.)

H.) On p 14, Mr. Dawkins tells us that a complicated object could not have come into existence in a single act of chance; which implies an absurd (but noncorrected) corollary--that any given 'simple' object (like Mont Blanc) _could_ have come into existence in a single act of chance!

I.) Mr. Dawkins has a concept of metaphor as a "vague" and inefficient means of conveying real information; when in fact metaphor is _so_ good at conveying information that he actually has to warn us in one description that he's _not_ being metaphorical (lest we inadvertantly draw the wrong mental picture about what he proposes is happening). (p 35) Metaphor and 'literal' language (as far as any language can be 'literal') accomplish different tasks, but both convey real--and useful--information. A metaphor that _isn't_ conveying real and useful information is a _mistake_, not standard-operating-procedure.

J.) TBW is riddled with statements to the effect that situation 'x' is too improbable to have reached condition 'y' by chance. Even setting aside the extremely complicated fallacies Mr. Dawkins tends to build around this sort of statement, the claim is pure nonsense. (It only looks sensible by borrowing grammatic cohesion from our English language.) A condition which cannot be obtained by chance is either impossible or obtainable only by direct action; either way it cannot be validly described in terms of probability. Yet Mr. Dawkins hangs a vast amount of his argument on the concept that events we cannot analyse probabilistically are nevertheless improbable (which implies that we _can_ analyze them in terms of probability.) This could also be filed under the 6=16 category, but he doesn't usually present it that cleanly.

K.) In a similar vein, Mr. Dawkins constantly switches in
an illegitimate fashion between claims of possibility,
probability and certainty.

L.) Although he didn't try this as often as I suspected he
would (he mainly seems to avoid the question of process), I
detected once or twice an implication to the effect that
fundamental physical properties change due to complication.
However, to his credit, he _usually_ sticks to the
transmission of inherent basic properties up the line of
complexity (such as in the beaver-dam example).

M.) Mr. Dawkins has a tendency to treat replicator/non-
replicator issues as though they always fit cumulative-
step/single-step processes (respectively.) So, for example,
on p 49, after giving us a pretty clear computer-monkey
example of what a single-step process _is_ (an event where
the conditions of one iteration have absolutely no
connection to the condition of the next iteration), he
claims that clouds cannot be considered "capable of
entering into cumulative selection" because, in essence,
they are not _replicators_ (they cannot spawn daughter
clouds resembling themselves.) Yet there are plenty of
processes (virtually every process, possibly excepting
quantum events) where prior conditions affect following
conditions, yet do not require such a specialized and
highly-complex cumulative step process as replication.
Although I don't think his discussion and use of these
issues is ultimately unsalvageable, I argue in chapter 6
that he _must_ in fact keep the shuffle going in order to
prevent a straight-up discussion of the issues from
undercutting his key 'argument' (to do it undue justice by
that word) against creationistic theism.

N.) As interesting as the METHINKS IT IS LIKE A WEASEL
computer-monkey experiment is, Mr. Dawkins doesn't play
quite fair with it. Specifically, he trumpets about how
much faster the cumulative-step monkey is than the single-
step monkey; but later we discover that the chances of
single-step mutation are about one every _million_
generations. We are _not_ told what the chances are that
any given iteration of the cumulative-step monkey would
produce a mutation in its population; but whatever those
chances are, it came out to be roughly one (favorable!)
mutation per generation. (For example it took only three
generations to breed a change between an I and an A.)
Furthermore, there was apparently more than one mutation

capable every generation, because the computer was told to search all given species members from a given generation and pick the individual which looked at least a little more like the target phrase. The clear implication is that the computer, for every generation, might have more than one mutation to choose from for a 'closer' fit to the target phrase. Now, a 1-in-a-million chance of mutation per generation (and not necessarily a _favorable_ mutation, remember!) might still be very likely to beat the same computer (using the simple single-step random guess) to the target phrase--particularly if we similarly handicap the single-step process by requiring _it_ to have a similar probability-of-mutation per generation as the cumulative-step process. But the resultant speed difference will have quite a different look than what Mr. Dawkins shows us. (This is not necessarily a serious problem with his argument; but it does show a tendency towards fudging in the sales presentation, so to speak...)

O.) Mr. Dawkins tells us that his biomorphic insects were unplanned, and even tries to explicitly illustrate this with an anecdote concerning what he had to go through to reproduce the effects (not having saved them the first time.) However, despite his specific claim (p 64), his selection strategy is demonstrably _not_ capricious; his opportunism does not invalidate his plan; and even a short-term plan (if guidance over 75% of the breeding program can be considered 'short-term') is still a plan.

P.) Mr. Dawkins paints any proposed supernatural action as a "violation" of natural law; and leans heavily on the implied emotional impact of "violation". Furthermore, he contends that the introduction of such an act into a working interlocked system like Nature would result in some kind of system-wide breakdown, or that to accept it we would have to abandon all of physics, or some such thing. However, his own biomorph program illustrates the fallacy of this contention: the more comprehensive (and, I would say, _better-designed_) a system is, the easier it can accomodate and digest events fed into it from the outside. If Mr. Dawkins is worth anything as a programmer, he should be able to set variables into his program to create (practically from nothing) a biomorph of pretty much any complexity he pleases, and then start the program with that biomorph in place as a 'going concern', so to speak. The fact that his program could never have produced such a creature under its own steam in one immediate swoop like

that (or maybe even at all!) doesn't keep his program from
running the biomorph with no trouble. (That doesn't mean
that any given biomorph introduced flatly into his program
will necessarily survive, of course; the introduction of a
viable biomorph in this fashion would be a factor of the
skill of the programmer and his knowledge of system
parameters. Most theists would agree that God is not stupid
and has some idea of how Nature operates!) In fact, Mr.
Dawkins can easily create a version of his program that
allows _anyone_ to start an already-complex biomorph as a
going concern, to save time. In other words (in terms of
the relative systems involved) Mr. Dawkins' program is
quite capable of accepting and using events and states fed
into it in a 'supernatural' fashion (i.e., not in
accordance with what the program could produce running
under its own specific laws), and even of having such a
'back-door' built into it _from the start_ as a live option
for any relatively supernatural agent (such as you, or I)
to use. If Mr. Dawkins hacks a bit of code to get a
biomorph going, or introduces his own input in any fashion
(above and beyond what the program itself can do, or is
doing), we don't claim that his program has self-destructed
nor that we have to abandon everything it's doing. It
would require abandoning any notion that _everything_
that we happen to see in the program must be an intrinsic
development of the program itself; but that's another kind
of topic altogether! Presenting one result as if it were
another result is misleading in the extreme, and can hardly
be said to be fair play (particularly with regard to people
who might not be able to figure out the switch for
themselves and who are relying on Mr. Dawkins to give them
the straight scoop!)

Q.) Mr. Dawkins sets up as an implied contrast of
efficiency in data transmission (versus Scriptural copying)
an example which he later admits was biased against his
typist subjects (the stand-ins for Scripture copiers in his
analogy), but he doesn't supply the corrective data.
Essentially, he uses the opportunity of discussing genetic
data transmission efficiency (itself a valid topic) to
leave the vague impression in the reader's mind that
'primitive' copying techniques must necessarily be error-
ridden because they're 'primitive'. This flatly ignores
basic (and advanced) textual criticism principles, and
conclusions (from liberal and conservative critics alike)
which suggest otherwise.

R.) Mr. Dawkins' ultimate argument against a Designer is based on the concept that evolutionary development is more 'probable' than a Designer's actions. Since his book's subtitle states (with a grammatic implication of 'certainty') that "The Evidence of Evolution Reveals a Universe Without Design", he must try to functionally equate improbability with impossibility. But this would only be restating point K of the 'Game-Rigging' category; the worse trouble is that in order to convince the reader that any sort of creation is vastly more 'improbable' than blind evolutionary development, Mr. Dawkins must flatly redefine a 'miracle' to mean only a single-step (read: grossly improbable) _NATURAL_ event! But this is utterly and completely illegitimate; as he himself points out in principle more than once when he decries opponents who 'argue' against Darwinian evolution by redefining and misrepresenting Darwinian claims to present a straw-man form of the theory which begins the game already defeated. In other words, Mr. Dawkins' ultimate argument against God requires that we accept _TO BEGIN WITH_ the notion that any claim of miracle can only mean that the claimant wants to posit a purely natural event. So, for example, under Mr. Dawkins' definition of miracle (which he _necessarily requires_ in order to argue against God), if I claim that God raised a man from the dead, what I am _really_ claiming is that some kind of horribly improbable natural event automatically happened. Under Mr. Dawkins' definition, I _cannot_ be claiming that a non-natural sentient entity intentionally acted within the natural system to bring about effects which the natural system of itself could never have produced. Mr. Dawkins' definition of miracle presumes _FROM THE OUTSET_ not only that a naturalistic universe must be true, but that even the backwoods supernaturalists presume there is no God and nothing outside the natural system to affect nature--that the supernaturalists by default accept naturalism. And of course, once we grant _that_ sort of defintion for 'miracle', then virtually any other option becomes a better 'bet' (and for Mr. Dawkins, a better 'bet' apparently means a rigorous definite certainty, even if the 'better' bet happens to be so thoroughly improbable itself that it only looks good compared to the most thoroughly improbable option of all.) I am far from denying that there are, and have been (particularly in the 19th and early 20th centuries), 'closet naturalists' who publically profess some kind of supernaturalism but whose arguments obviously presume the denial of the concepts they supposedly

represent. This sort of person is (and has been) just as common among the untrained "backwoods" layman as the "educated bishop". However, that is not supposed to be the sort of person Mr. Dawkins is arguing against in TBW; he's supposed to be presenting arguments against people like (for instance) myself who really _do_ accept supernaturalism. This is the key "Argument from Game Rigging" (as I've called it) in TBW; even now I cannot tell whether to laugh all the harder at the vastness and impudence of the central fraud of Mr. Dawkins' book--or sigh for the people who, lacking the skill to figure out such things for themselves, trusted him to play fair.

S.) Although he doesn't hang a lot of his argument on this misconception, Mr. Dawkins uses a tactic (very common in philosophical debate on all sides, unfortunately) of painting an oppositional belief as 'irrational'. In this case, he casually asserts (more-or-less in passing as a settled issue) that a theory which includes miracles cannot (by default, apparently) satisfy a 'rational' mind as efficiently as a theory which avoids miracles. Aside from the fact that no argument whatsoever is presented to back this (which makes this assertion a tacit game-rigging presumption against theism), such a view also ignores the possibility that a proponent of miracles might only be merely _mistaken_--a condition which requires rational argument and judgment of evidence. An honest mistake (or even a dishonest rigging) is still, as far as it goes, a rational action. Mis-adding a group of numbers need not be a result of irrationality; it might be a result of lack of skill, faulty perception (that 1 sure _looked_ like a 7!), or a break in sequence through distraction (I'm adding up 326 figures; I have to leave suddenly to answer the phone; I get back and continue from the wrong position.) The good news is that Mr. Dawkins barely relies on this sort of tactic; however, it's still present in at least one place (p 141).

T.) Mr. Dawkins has little compunction against using bald speculation--for example, the existence of 100 billion billion planets--as a hard figure for building important probability-estimates. Sometimes he expresses this tactic as a variation of the Argument from Personal Credulity (e.g., "My personal feeling is that... we need to postulate only a relatively small amount of luck [for such-n-such]." p 146)

U.) In a bit of game-rigging against another set of opponents (the punctuationists), Mr. Dawkins presents them as claiming that evolutionary change is concentrated during the times of upheaval. However, this goes against the grain of an _earlier_ description of punctuationist theory by Mr. Dawkins himself: that the upheaval occurs _because_ concentrated evolution has _already_ taken place elsewhere (and that this helps account for the appearance of jerky development in the fossil record.)

V.) In another bit of game-rigging against the punctuationists, Mr. Dawkins identifies one of their chief precepts as "one of the theoretical props of Mayr's inertia idea" for part of his attempt to use selective breeding programs as evidence against intrinsic anti-evolution inertia in species populations (posited by the punctuationists.) However, the key to Mayr's point (as Mr. Dawkins himself explained earlier in the same chapter) was the _size_ of the population; that is, the larger the interbreeding population, the more genetic 'inertia' would exist against the successful spread of mutations through the gene pool. Selective breeding experiments, then, don't function as a fair comparison for purposes of evidentially undercutting punctuationism: the population is relatively very low compared to a natural population; and the breeders artificially cull specific types. This process is explicitly _designed_ to produce the maximum efficiency in the spreading of genetic mutations. Natural populations, by comparison, are much larger (fitting into Mayr's point, which is what Mr. Dawkins claims the punctuationists build on), and have much less efficient culling processes (in terms of time, at least.)

W.) Early in TBW, Mr. Dawkins goes to some trouble to categorize 'single-step' events as being examples of 'randomness', and 'cumulative-step' events as having 'nonrandom' features (as well as having some randomness, of course.) After making quite a bit of hay out of this, he abruptly shifts his position in Chapter 10 and describes a particular process as being "**closer to single-step** selection than to cumulative selection" [italics mine]-- _because_, he says, it is a _nonrandom_ event. I suppose this may be merely poor topical composition on his part (I offer a guess or two to what he may have meant instead); but as it stands he strongly contradicts his own heavily emphasized position--which increases my suspicion that his whole single-step/cumulative-step sturm-und-drang was

arbitrarily fused to the biology for some other purpose
(philosophical, as I've speculated elsewhere).

X.) In a bit of game-rigging against the Lamarckists, Mr.
Dawkins extracts some of their precepts out of context of
their philosophical underpinnings. Supposedly he does this
to give them "a fighting chance"; in reality, it allows him
to dispose of the mainspring of their theory (philosophical
vitalism) without actually arguing against it--a very handy
(though somewhat illegitimate) tactic, since their theory
is _more_ vulnerable extracted from their philosophy. Of
course, he says some neo-Lamarckists have done just this
themselves, so on the face of it this might be a legitimate
tactic (the neo-Lamarckists having opened that avenue
themselves). However, he doesn't stay merely on the
science--a key part of discrediting even the neo-
Lamarckians remains, for Mr. Dawkins, a dismissal of their
philosophy as inaccurate. He attempts to accomplish this on
page 290 by contradicting one of his own statements about
early Lamarckists which he made less than two pages
earlier: Lamarck "simply incorporate[d] the folk wisdom of
his time", which does not gell with Mr. Dawkins' earlier
statement that Lamarck "used the best theory of the
mechanism of evolution that anyone could come up with at
the time". "Anyone" presumably includes the best and
brightest thinkers working with what was available to them,
not merely the proponents of "folk wisdom". Either way, he
airily dismisses this concept by giving it a derrogatory
label and (presumably) hoping the reader is snobbish enough
to similarly dispose of the concept without argument.

Y.) Mr. Dawkins, in order to 'refute' Lamarckism, presents
as a 'possible' option under Lamarckism a particular
situation (a species of animals developing with a sense of
pleasure for activities which hurt them, and a sense of
pain for activities which help them) which even under
Lamarckism could never be produced by natural evolution.
The only possible means by which such a 'species' could
come into existence (barring intentional fiddling from
outside the system, such as we might breed in a species for
our purposes) would be through a saltationistic single-
step jump. Even _then_ the species would very probably
never get going (i.e., we could call one ancestor or maybe
even seven individual descendents a 'species' if we insist,
but it's hardly "easy to imagine" a _viable_ population of
this sort coming into existence even by saltationist
methods.) But the Lamarckists are not saltationists; they

accept and propound a gradualistic development based on
cumulative-step selection (certainly insofar as a species'
response to the interaction of individuals with their
environment.) In other words, after 13 pages of in-depth
discussion about the process features of Lamarckism, Mr.
Dawkins expects us to suddenly ignore all that and accept
that under Lamarckism something like a masochistic species
could naturally come into existence.

Z.) In one last game-rigging against Lamarckism, Mr.
Dawkins reduces their claim from a correlation between
effectiveness and effectiveness, to a (specifically) "loose
and crude" coupling between mere _size_ and effectiveness.
Startlingly, he does this despite telling us earlier that a
Lamarckist would claim that, "As a result the parts of the
body used in the striving grow larger, **or otherwise
change in an appropriate direction.**" (p 291, my italics).

Miscellaneous Cracks

A.) Mr. Dawkins goes to some degree of trouble (for
instance around pages 36-37) to separate two sorts of
biological behavior, which may be typified by the following
example: the behavior of understanding complex mathematical
ideas, and behavior _as if_ the entity could understand
complex mathematical ideas. He gives plenty of
illustrations to the effect that biological development
from non-intentional physics reactions and counterreactions
can produce behavior _as if_ rational (what we'd otherwise
call instinct, though I was surprised how little he seems
to use that word in TBW); but not once does he even attempt
to explain how behavior _as if from_ understanding becomes
understanding. One would think, looking at his examples,
that only behavior 'as if' from reason could develop
biologically in a purely physical nature of the sort he
posits and defends. Yet he constantly assumes and even
requires that you, I, other people and he himself can
reason (not merely behave _as if_ we could reason.)

B.) Mr. Dawkins has a tendency to write as if he has
already accomplished something which, strictly speaking, he
hasn't really touched yet. Choosing one fairly clear
example (out of a multitude), he writes on page 43, "We
have seen that living things are too improbable and too
beautifully 'designed' to have come into existence by
chance." But even within the context of his argument's

structure, we _haven't_ been shown this yet--we've been
told this, and a flat assertion is different from a
demonstration. (And this leaves aside the question of
whether he _ever_ gets around to sufficiently demonstrating
this!)

C.) Despite Mr. Dawkins' own warnings and qualifications,
he has a tendency to describe his computer experiments
using rapturous odes to "the blind forces of nature" (for
instance, p 49)--despite the obvious fact that (unless he
considers _himself_ a "blind force of nature") he
explicitly helped the processes along with overt design
constraints and conscious choice-making. He even describes
his own conscious contributions to the experiments in
detail! A very clear example of this sort of thing happens
on page 59, where Mr. Dawkins specifically says that once
he recognized that one of his biomorphs looked a tad like
an insect, he began to explicitly choose progeny that
looked the most like insects from which to breed--with
strains of _Also Sprach Zarathustra_ running through his
head, even! Yet apparently the result (an insect-shaped
biomorph) took him completely by surprise and he somehow
concluded that it was "undesigned and unpredictable."
(There is a 6=16 conclusion attached to this as well; what
I'm highlighting here is the astonishing naiveity either
being exhibited by Mr. Dawkins--or expected from us
readers!)

D.) Every once in a while, Mr. Dawkins will toss in a
statement which simply _must_ be merely a composition
error, because it's completely against the whole thrust of
his argument. One example of this would be this sentence
from near the bottom of p 81, "Ancestors of stick insects
that did not resemble sticks did not leave descendants."
This sort of thing could be easily fixed with a bit of
rewriting; it's probably just a case where he knows his
topic so well that when he re-reads a sentence like this he
already knows what he _really_ meant (as opposed to what,
in fact, he wrote), and doesn't foresee the sort of
confusion it can engender in critics. (I am, of course,
assuming that this sort of thing is merely a grammatic
accident and that he clearly meant something else, based on
the surrounding contexts. Given some of his other habits,
though, I wish I could be more sure about this.) At any
rate, such blurbs are ripe for revision.

E.) Obviously, quite a bit of Mr. Dawkins' goal consists of illustrating how very simple things become 'organized' (metaphorically speaking) into extremely complex things. When it comes time to discuss the philosophical backings to this concept, he actually misses a point in his own favor: philosophical naturalism does _not_, in fact, have to account for this process at all possible levels. In other words, the physical universe (which, according to the naturalist, is all that exists) is _already_ mind-bogglingly complicated, and has been since the beginning (presuming it had a beginning, which is not quite an ironclad position, either, as far as I can tell: if it obviously did have a beginning, naturalism would be dealt a very serious blow, though not necessarily atheism.) Therefore, the naturalist only has to explain how particular simplicities _within the overall complexity_ have managed to 'develop' into organisms with biological complexity. I consider this an easier task (at least in theory) than trying to present and defend some sort of philosophical principle which describes _ultimate_ simplicity becoming complicated. Mr. Dawkins' own position on this remains unclear (e.g., his infamous units with "utmost complexity, far too simple" to need design!); but he doesn't explicitly take advantage of this stronger philosophical position, and sometimes (e.g., p 141) he seems to be apologizing for an 'ultimate simplicity becomes complexity' stance.

F.) In a similar vein, although Mr. Dawkins rightly points out that "To explain the origin of the DNA/protein machine by invoking a supernatural Designer is to explain precisely nothing, for it leaves unexplained the origin of the Designer," (p 141), he seems unaware that he often does exactly the same thing from the other direction: he commonly explains the origin of the DNA/protein machine by invoking the ultracomplicated interconnected laws of nature as a 'given'. By his own application of principle here, though, he explains precisely nothing when he does this, for he leaves unexplained 'the origin of Nature'. The very _best_ he could claim (by his own testimony here) would be a stalemate; presuming theists have no better arguments (they do) and his naturalism has no other extremely self-damaging properties (it does.)

G.) Mr. Dawkins speaks of using a 'ration of luck', spreading it between (for instance) probability of life arising on any planet and probability that any of that life

should get to our stage. Specifically, since his personal feeling (the Argument from Personal Credulity again!) is that we need only postulate a small amount of luck to the development of life and intelligence, we can "virtually spend our entire ration of postulable luck in one big throw, in our theory of origin of life on a planet." However, this concept falls to pieces if we actually apply it to a working scenario: if I slam-dunk a basketball (with a given 1-in-5 chance) on my second attempt rather than my fifth, do I have some sort of 'ration of luck' left over which I can then apply to make a shattered board more probable? There may be some sort of valid use of probability being tossed around here, but it needs better presentation.

H.) This was a particular probability gaffe that was so unusual it didn't seem to fit anywhere else, but I think it deserves special mention--at least for comedy relief. Mr. Dawkins implies heavily on page 159 that if an event with one chance in 250 trillion were to happen to him (specifically, that if he were struck by lightning in the exact minute he asked for it), he would consider this grounds for believing it to be a supernatural event. He has apparently forgotten that even his best estimates of probability for non-directed purely natural gradualistic evolutionary development are several orders of magnitude _LESS PROBABLE_ than the sort of event he would consider good grounds for believing to be miraculous (however he wishes to define 'miraculous')! By his own standards, then, we should bet on a supernatural Designer rather than naturalism for providing even a gradualistic evolutionary process! Fortunately (in a backhanded sort of way) the principles he uses to underpin his lightning example are already logically fallacious, so this conclusion cannot be used against naturalism. It's still pretty funny, though.

I.) In a general sense, Mr. Dawkins doesn't have quite as much of a grip on his probability conclusions as he would have us believe; particularly if we bother to remember implications from one chapter to the next. In one notable example, for instance, a realistic change from mouse to elephant-sized creature (a fairly real-life example) would take, on average, 60 billion years rather than 100 or 300 million--once we apply some of the implications Mr. Dawkins went to the trouble to provide us in earlier chapters. Of course, even the 100 million year result would still be _possible_ (though highly unlikely), and so in _hindsight_

there might not be a problem; but Mr. Dawkins' arguments
often hinge on our rejecting an option based on hindsight
estimates of probability--and he seems oblivious to the
actual implications of his own mouse-to-elephant example!

J.) Despite a good bit of talk about the fossil record, Mr.
Dawkins stays clear of trying to use the fossil record as
positive evidence _for_ evolutionary theories (scientific
or philosophical.) This illustrates a general tendency
(which greatly surprised me) to shift the burden of proof
from positive evidential claims to a sort of probabilistic
bait-n-switch. Specifically, the fossil evidence, as is,
tends to be a bit of data to be explained _by_ the theory
(which must _on other grounds_ be given some sort of
possibility and plausibility), rather than presented as
evidence _for_ the theory. I don't say this is, in itself,
a misstep--it still has to be done, if possible--but its
downplay in a book with such self-consciously far-reaching
goals as TBW puts a sharp brake on how far Mr. Dawkins can
actually get going.

Now, compare the list of Cracks with the statements of Mr.
Dawkins' 1996 Introduction from which I commented earlier--
and keep in mind that many of these Cracks represent errors
which take place _throughout the book_ more-or-less
consistently! For instance, the majority of TBW's chapters
(perhaps all of them?) contain examples of Mr. Dawkins' own
belief in an objective morality with characteristics
different from what we could derive from his own
(admittedly limited) specific discussions of 'how morality
is produced by Nature.'

As it happens, this particular example illustrates what may
be (to the unsuspecting reader) the most surprising
conclusion possible from _The Blind Watchmaker_. But I'll
need one more chapter to follow the path through the
cracks.

Chapter 13: "Be so kind as to read once more the chapter of
the windmills..."

"The metaphysical proofs for the existence of God are so remote from
human reasoning and so involved that they make little impact, and, even
if they did help some people, it would only be for the moment during
which they watched the demonstration, because an hour later they would
be afraid they had made a mistake." -- Pascal, _Pensees_, 190 (543).

This bit of common sense from another non-professional
Christian apologist always puts a check to any delusions of
grandeur I might at the moment be entertaining! Yet I get
the impression that metaphysical arguments _against_ the
existence of God (whether or not they are dressed up as, or
piggy-back on, scientific arguments) don't suffer quite the
same ambiguous response. If you think otherwise, ask
yourself: 'When was the last time I saw a thorough piece of
Christian--or Muslim or Jewish--apologetic on the New York
Times Bestseller's List?' One may, of course, find some
evangelism on the List; a fairly rare occasion, yet
perhaps as often as anti-theistic works. But evangelism
isn't quite the same thing as apologetics; the mental
emphases are different. Nevertheless, what amounts to anti-
theistic apologetics are fairly well-received in Western
society; and _The Blind Watchmaker_ is an example of such a
work. _Straw Man Burning_ has not been exactly an example
of Christian (or generally theistic) apologetics--certainly
not a full apologia--but it obviously contains a strong
streak of such material at key places; and you may be
curious to know what it is I think I've accomplished, and
why.

I think I have shown there are massive problems with Mr.
Dawkins' methodologies and conclusions. These problems are
not just restricted to one or two key points (though that
in itself could be enough to justify a major revision); but
are spread throughout his book. Although some of the later
problems stem from the fact they are built on unstable
earlier arguments, I think I have shown that (as bad as
that is) very many of the faulty arguments proceed from Mr.
Dawkins' persistant application of a number of faulty
methodological tactics and strategies; which means he's
constantly introducing new errors as well as building on
top of old ones. Let me assume that I'm correct about this.
What are the implications?

Simply put, it means that his protracted argument
throughout the book is persistantly invalid. That means we

have no reason to accept Mr. Dawkins' _arguments_ as true.
You may, of course, have reasons to accept that the
conclusion he tries to reach (which, as I've shown, is
actually a hidden premise, at least in TBW) is true; but
logically the conclusion cannot follow from Mr. Dawkins'
own arguments in TBW. You will have to be apply to other
arguments outside TBW (perhaps from Mr. Dawkins' other
books, such as his 1996 _Climbing Mount Improbable_, or
Daniel Dennet's _Darwin's Dangerous Idea_.) If I'm correct,
you can only hold a logically valid belief in naturalistic
evolutionism (and perhaps even in biological evolutionary
theory) by following _other_ arguments than the ones Mr.
Dawkins presents here.

I realize this looks like I'm trying to 'tell you what to
think'. If so, I apologize, because that's not what I'm
trying to do. I'm trying to explain the necessary,
deductive consequences that follow from the persistant
invalidity of a logical train; and the cold hard fact is
that _if_ I'm correct about TBW's persistant invalidity,
then any belief you hold similar to Mr. Dawkins' attempted
'conclusions' as presented in TBW, you are necessarily
holding _in spite of_ TBW.

This is not necessarily cause for alarm; I myself hold a
belief in conclusions shared by the authors of certain
books whose methodologies, I believe, render their
arguments as presented invalid. I hold these beliefs
despite those books. I hold them _because_ I think I have
good grounds _developed validly elsewhere_ to hold those
beliefs. I do not know your mind; I do not know everything
you've read. For all I know you may have found very good
reasons to believe philosophical evolutionism to be true.
(As I've noted throughout the book, I really have no stake
in trying to refute biological evolutionary theory.) But if
Mr. Dawkins' arguments in TBW are invalid, you cannot be
following a validly logical path to that belief along
those lines. To say otherwise would be a contradiction in
terms. Of course, if I've argued correctly, Mr. Dawkins'
arguments themselves in TBW require numerous contradictions
to get off the ground, so perhaps you're comfortable with
that. But then so much for any claim that you believe one
thing and _not_ another (e.g., that the nonsentient,
physical universe is all that exists and there is _not_ a
God.)

I'm trying to qualify myself here; I don't want to pretend
that by shooting down this one book of Mr. Dawkins' I have
utterly and finally argued against philosophical
naturalism. Mr. Dawkins may have valid revisions to make in
this argument. He may have argued validly to that
conclusion in other books. Other thinkers may have done the
same thing. But there is one necessary consequence from Mr.
Dawkins' invalidity (wholesale and otherwise) in TBW which
logically applies to any other arguments you've heard or
read.

An argument (singular or composite) which has once been
proven invalid may not be part of any other potentially
valid argument. Significant revisions to an earlier
argument are certainly allowable, but then the new argument
will (by default) be significantly _different_ from the old
one in its methodologies, assumptions and/or facts (even if
they reach the same conclusion.) I'm not saying anything
against significant revisions; I'm saying the same
argument, trotted out again under a fresh coat of paint, is
still the same dead horse. This is surely a position Mr.
Dawkins agrees with in principle, as evidenced by how he
traces the Argument from Design (for instance). Well, the
same here. If 6=16 doesn't work here, it's not going to
work elsewhere. And it's not always easy to tell if a 'new'
argument is the same old dead argument. Sometimes it's
blatant: in my own field, people will dig up the
'syncretism' explanation of Christian origins every twenty
years or so, with no better means of supporting it than
when it was first solidly refuted in the very early
twentieth century. Sometimes it's not blatant: Mr. Dawkins'
own use of the Argument from Design methodologies can be
hard to spot because the subjects involved are different.
The only way to be sure is to keep doing the dry, boring
logical math and see what adds up. Check to see what
principles are involved in the argument, and then try to
remember if you've seen the same application of principles
refuted before. Even if you have, I'll grant you that this
time might be different--but don't _assume_ it is. Go ahead
and check it out. Add it up for yourself. The only way it
can be different is if it really is _different_ from the
earlier refuted argument.

How many times does it take to solidly refute the notion
that someone can beat casino house odds from _within_ the
casino's payback ratios? Only once. After that, it doesn't
matter what new gambling systems look like--you can be sure

they _can't_ be true in that fashion. They can only be true
if they're really doing something qualitatively different
from the refuted argument; and sometimes you can tell when
it's simply impossible for the difference to be
qualitative. There is nothing that _you_ can do to
manipulate the house system for roulette in your favor, for
instance. It's a mathematical (and physical) impossibility.
Roulette is a game that forces you to play within very
strict rules set up by the house; and it's not hard to
demonstrate that those rules will eat, on average, 5.56% of
your money. Once you understand the principles involved,
you can be utterly sure that the most complex formula
imaginable won't help you as long as it's _within_ the
house system; because the most complex formula imaginable
within the system _uses_ the system--and the system is
built to take away 5.56% of your money. When the examples
are simple, it's easy to see this; when the examples are
more complicated, the results are still the same, but it's
harder to see. The only way to beat the casino system is to
apply an effect which is independent of the system (though
the system may be dependent on it.) So, for example, there
are people who study casinos to find older roulette tables,
and these people take statistical measurements of the table
results. Over time, the wheel will become slightly
unbalanced due to frictional effects, and return a certain
group of numbers slightly more often than others. Once you
know the frequency of this return, you can calculate to
discover whether it overcomes the 5.56% built-in across-
the-board house odds against you in the casino math system.
NOW you have a procedure which is qualitatively different
from trying to beat the house edge from within the system
(which is logically impossible.) (Before you get too
excited, remember that the casinos know about this and so
replace their wheels whenever possible; it's never a
permanent situation. Modern casinos use computers to track
those wheels far more thoroughly and persistantly than any
observant player ever could, and so they are immediately
alerted when a wheel has become disbalanced. Also, the
return in your favor will only tend to be between one and
three percent.)

You may remember that I've also used this example to
illustrate the philosophical problems inherent in trying to
trump the system; we'll get back to that in a minute. What
I want to point out now is that this is an example of
significantly revising a procedure so that something
really different (and not just _apparently_ different)

can be applied to the problem. This is the sort of thing
you should be looking out for when you survey philosophical
theories from either side. Whenever I hear of a new version
of the telelogical argument (the AfD), I get very
suspicious; and inevitiably I've discovered that nothing
new is going on. (I also know, historically, why the
mistake took place, which helps me understand the mistake.)
That means it still doesn't work. Mr. Dawkins should agree
with me on this. Similarly, I believe there are radically
unsound methodological procedures which are not
themselves terribly hard to understand, yet which
undercut naturalism at its fundamental level. I can be
deductively sure that any argument which applies these
procedures will fail, no matter the target conclusion. If
new, fancy-dress supercomplicated theories mean at bottom
the exact same principle of argumentation as the simpler,
invalid theories, then the application of principle
guarantees that they must themselves be invalid. No matter
how complicated 6=16 gets, it's still an incorrect
contention. It can't be making a true statement. The
problem lies in detecting the fundamental similarities.
That means doing the logical math.

So, if Mr. Dawkins has presented a set of contentions,
a...z; and if I succesfully refute subset µ of those
contentions (possibly including all of set a...z); and if
Author 'Gamma' uses any or all of the subset µ arguments
(or arguments which amount, in principle, to the same
arguments as subset µ), then Author 'Gamma' may be
considered to be proactively refuted by my work.
Specifically, any naturalistic argument which requires an
equivalent version of an argument I've successfully refuted
from TBW will also be invalid and in need of revision. If
every naturalistic argument requires by necessity such
argumentation by default, then naturalism itself may be
considered refuted. I'm not claiming that I've done that,
here in SMB. But you may, perhaps, discover this for
yourself once you begin applying the principles.

And this has momentuous consequences, philosophically. One
means of proving the truth of Contention 'A' is to assume
the falsity of 'A', and then demonstrate that holding the
falsity of 'A' contradicts necessary conditions. Thus, one
means of proving the truth of the proposition that 'the
ultimate Fact of reality upon which everything is based is
Sentient' (i.e., there's some kind of God), would be to
assume that this contention is false (e.g., 'the ultimate

Fact of reality upon which everything is based is _not_
Sentient'), and then demonstrate that this requires a
contradiction of a necessary truth. I think I can do this;
furthermore, I have scattered references to this process
here and there throughout SMB, using Mr. Dawkins' own
positions as a means. Pulling it all together into one
coherent argument (much less an argument that leads to
Christianity instead of a vague theism) would probably
require another two books; but until then let me detail
what I think I can positively argue using the implications
(hidden and otherwise) in TBW itself.

Let me remind you that I did not find one single shred of
positive argument against God's existence and/or character
in TBW. There is a great deal of innuendo; there is a great
deal of presumption regarding God's nonexistence--in fact,
much of Mr. Dawkins' ostensible argumentation to that
conclusion rests upon that presumption! There are serious
misrepresentations of position. And there are, of course,
numerous implications that what is being offered is
nevertheless some kind of positive argument why we _should
not_ accept the existence of God. Even TBW's subtitle
claims that the book _REVEALS_ that the universe _WAS NOT_
designed. But any actual positive argument against God?
Zip. Nada. Zero.

On the other hand, although we certainly never find Mr.
Dawkins presenting 'official' arguments _in favor of_ God's
existence (he is, after all, an atheist), we do find what I
have labelled 'Mud On The Carpet': incommensurate leaps
here and there in his argument which indicate that
something else, which he's not taking into account, is
involved (in a logically prior way) with nature. At times
his own positions indicate that there _must be_ something
else other than an ultimately nonsentient, nonmoral Fact.

On page 38 of TBW, Mr. Dawkins wishes that Hugh Montefiore,
in _The Probability of God_, had used genuine biologists as
his authorities, in the Bishop's attempt to bring natural
theology up to date. Somewhat belatedly, I grant Mr.
Dawkins' wish. Here is a list of the arguments of the
(presumably) genuine biologist Richard Dawkins, where the
hidden implication of God seems to me inexcapable.

Mr. Dawkins presents a comprehensive explanation of how
nature might produce expectations of probability, which he

labels subjective; and (as an explicit consequence of this
subjectivity) the expectations lack proper grounding for
validity. He brings this up to explain why our feelings
about probability are not a valid argument against the
massive improbabilities required of evolutionary theory.
However, here and elsewhere throughout the book, he
consistently evidences a belief that he can rationally
process probability estimates and reach logically valid
answers. Yet his comprehensive explanation of how
nonsentient natural processes produce expectations of
probability contains not the slightest provision for this.
Conclusion: Mr. Dawkins' ability to _really_ estimate
probability was _not_ given to him by nature. Note that it
makes no difference that he himself is, in fact, apparently
inept at actually using probability theory. A mistake
implies that it was at least theoretically possible to
reason cogently to the correct answer, which is not the
same as a subjective impression about probability (which is
all that he allows from nature). Either Mr. Dawkins' own
opinion about probabilities is just as subjective as the
natural impressions he describes, and thus (by his own
argument) are worthless--which guts his immediate argument
and anything he tries to build from probability estimates--
or something other than a blind, nonsentient nature
provided him with his ability to estimate probabilities. If
we say he provided it to himself, then we are still left
with a creature which transcends the very thing on which
(by all naturalistic accounts) he depends. A Sentient
Independent Fact (SIF) could, being sentient, _choose_ to
allow a dependent entity some relative autonomy; a non-
Sentient Independent Fact (n-SIF) would not have this
capability.

Mr. Dawkins describes the most fundamental natural
entities--sub-atomic particles--as non-sentient, amoral,
purely automatic. He insists that this property of non-
intentionality is transfered up through ever increasing
complexity to the macro-scale behaviors of macro-scale
entities, such as beavers. Yet he himself claims to be able
to think, and claims to make ethical value-judgements.
Furthermore, he assumes that you and I (his readers) can,
too. There is literally no possible explanation for this
under his theory (at least as presented in TBW); the
transmission of non-intentionality is regarded as a
fundamentally basic deductive necessity, not dependent on
relative complexities or material properties. This means

that under his theory, humans should behave like driver
ants, beavers, etc. However, he presumes and asserts
throughout his book at key points that we, himself
included, do not in fact behave this way. The consequent
implication is that our ability to think and make ethical
judgements depends in the final analysis on something other
than blind, automatic, nonsentient nature.

Mr. Dawkins makes numerous ethical statements throughout
the book. Taken at face value (and he provides no
qualification), these are statements about his perception
of objective ethical facts. Although he bases no logical
argument on these statements, his treatment of the
statements strikes against the 'explanations' of ethical
behavior which we find scattered throughout the book. This
observation even involves his justification for writing TBW
in the first place: that people _should_ be presented with
the truth. But his explanations about where feelings like
this come from lead us to ultimately nonmoral, automatic
reactions and counterreactions. Thus, under his own theory,
his statements cannot mean what they seem to mean, but are
only statements which describe his condition at the moment
he wrote. He makes it fairly clear that this is the only
sort of explanation for these events that nature offers.
Consequently, if he wants to be taken seriously about his
ethical statements (be he right or wrong), he can only be
validly applying to something other than non-sentient,
amoral nature.

Furthermore, he cannot validly be applying to an ethical
code (universally averaged or otherwise), unless we humans
are getting their impression of this/these code(s) from
something objectively independent of ourselves: remember
his explanation of subjectivistic impressions of
'improbability' which he took pains to undercut based on
the subjective characteristic of the impression itself.
Unless we are getting our impressions of 'should' and
'ought' from something objectively independent of us, then
our impressions are _ultimately_ subjective (instead of
being merely perceptively subjective--we could all have
subjective impressions of an objective truth, but the
potential validity of our impressions depends on there
being an objective truth to compare our subjective
impressions against). Applying Mr. Dawkins' own principle
regarding the validity of ultimately subjective
impressions, our ethical impressions are invalid without an

objectively independent base. Unless the base is itself
inherently capable of producing or providing or reflecting
or representing a real ethical position, then our
impressions of it are not ultimately 'ethical' (though we
may mistakenly interpret them that way). Thus, the fact
that Mr. Dawkins consistently takes his _own_ ethical
judgements seriously, and expects us to either sympathize
or be persuaded by them, yet reminds us constantly that
nature has nonmoral basic properties (and that such basic
properties are transfered up the line through levels of
complexity), all implies only one thing: we can only take
his ethical stances seriously (even if only potentially
valid) if they reflect a non-natural source independent of
humanity--and this source must itself have intrinsically
moral characteristics different from nature's
nonmorality.

Some of Mr. Dawkins' arguments include overt statements to
the effect that something produced by humans (his
biomorphic results, for instance) will be 'artificial' as
opposed to 'natural'. When we read the descriptions of
these two types of effect, the distinguishing
characteristic is the intention and action-ability of the
human, as opposed to the blind, automatic processes of
'nature'. Yet Mr. Dawkins is equally clear that the
property of non-intentionality inherent in natural
processes is carried clear up the chain of complexity to
fully account for the complex behaviors of animals.
Notwithstanding this, he still tends to assume that human
behavior is somehow independent of these blind, nonrational
processes, to the extent of calling human artifacts
'artificial'. He even uses this rationale to provide
grounds for supposing that a planet full of computers and
other mechanical objects necessarily implies rational
designers (be they extinct or otherwise). Ironically, he
doesn't label _this_ an application of the AfD, though it
is. However, the point is that Mr. Dawkins throughout his
book accepts and asserts that human behavior is not
exhausted by natural process. Technically speaking, this
means human behavior has a supernatural element. (There
are, of course, times when he flatly asserts the opposite
of this contention, though rarely applying it to humans.
Any such attempts falter on his own implicit claims of
valid ethical judgments, plus the existence of TBW itself
as a means of argumentation.)

More specifically, his discrepency between artificial and
natural hinges ultimately on rational behavior behind the
artificial; and this characteristic of rationality is not
provided for within the natural process, according to Mr.
Dawkins himself (taking the actual implications of his
stances and arguments into account). Thus, human
rationality must be dependent on some sort of
characteristic of reality which is itself independent of
nature. In essence, Mr. Dawkins himself testifies that
human rationality is a supernatural effect; and the
supernatural source must be something inherently capable of
producing dependent rationality in humans (else we're just
putting the problem one stage futher back).

In short, several of Mr. Dawkins' own contentions, and even
his own basic assumptions (once actually examined and
applied), lead us toward the existence of a supernatual,
rational, ethical, humanity-independent ultimate entity. He
actually leads us _to_ the very sort of God which he so
vehemently denies. He avoids this conclusion mainly by
subterfuge, category errors, outright avoidance of
necessary implications, appeals to emotion, and flat-out
presumption of the opposite position as a starting point
for interpreting any further considerations. Cancel these
out, or otherwise account for them properly, and there are
parts of Mr. Dawkins' own book which provide what I
consider to be powerful (though subtle) arguments for the
existence of a supernatural, ethical creator God. They do
not cover all the issues of a fully synthetic apologetic,
though of course we could hardly expect them to. But they
give us a hint (frankly more than a hint) of what such an
apologetic would look like; and it's a hint compatible with
creationistic theisms like Christianity (whether or not
biological evolutionary theory taken by itself turns out to
be true). Meanwhile, the remainder of Mr. Dawkins' anti-
theological argumentation tends to refute itself so
completely that he effectively helps emasculate the
naturalistic argument which opposes supernaturalistic
theism.

Again, I am not saying such an emasculation is complete;
but I think it behooves a sceptical reader to reevaluate
the naturalistic position. The worst that can happen is
that the dead wood is removed from naturalism, which allows
a stronger, more consistent position. The best that can
happen is...? Well, let's face it: under practically any

conditions, Christianity's truth--even the truth of such a theism which can be gleaned from Mr. Dawkins' own arguments--means more for you ultimately than naturalism's truth. It means that death is not the end; and that you are assured of being utterly, ultimately satisfied, if only you'll take the opportunity. Everyone admits this already; that's why the anti-theist argument from wish-fulfillment has such prima facie plausibility. But if it's really true...? Then the sky is not the limit after all, is it? This is the difference between wish-fulfillment and good news!

But that sort of argument will have to wait for another book; properly speaking I should be fair and note again that one possible result of solidly refuting Mr. Dawkins will be the emergence of a tighter, stronger atheistic naturalism. You may conclude, and even insist in the end, that Mr. Dawkins himself is only a straw man; and that stringing his argument up to burn is, really, no great feat after all. If you conclude that, I'll still be satisfied; as long as you remember that straw men don't suddenly become men of steel merely by changing their clothes. A straw man burning here calls for the ignition of similar straw men everywhere else. The question is: what will be left standing after the fire?

Appendix 1: Some Secondary Considerations

In this appendix, I will attempt to answer some questions
of a relatively minor sort which I suppose some readers may
be curious about. These are in no particular order.

IS THERE A SIGNIFICANCE OF SOME SORT BEHIND THE OPENING
QUOTES FROM LEWIS AND PASCAL IN YOUR FIRST CHAPTER?

There were several minor considerations at work there.
Christians can in some ways be divided into two ostensible
categories; those who start with the presupposed existence
of God and/or of the Bible's inerrancy and work out
theologies from that point, and those who start with other
assumptions and work their way back to God. Pascal is
certainly an example of the former (his apologia largely
requires as a necessary premise the inspiration of the
Bible) and Lewis is certainly an example of the latter (his
apologia requires as its chief formal premise the
rationality of the human mind.) Thus, part of my choice of
introductory quotes was to use Christian thinkers who would
be amenable to one side or the other. I have called this
division an ostensible one, by the way, because I have yet
to see any theory which claims to start from God and work
down that does not actually start (implicitly) with the
potential validity of human cognizance (without which we
would be literally unconscious of God); and despite some
interpretations, thinkers like Lewis do eventually conclude
with the transcendence of God above human reason,
presenting Him as prior in a causal, factual sense (which
is what the presuppositionalists want to preserve.) Thus,
both methodologies are two complimentary sides of the same
coin of Christianity, in my judgment. (To be fair, I should
admit that Pascal is not a complete presuppositionalist; so
I've weighted the scales a bit toward my own preference!)

Another reason for choosing Pascal was that he rejected
(for his own reasons) the teleological theory as being
fallacious as a primary argument for Christianity or God's
existence; and did so in a conclusive fashion roughly 200
years before Paley's _Natural Theology_. This is one reason
I consider Paley a straw man; worth correcting perhaps for
people who have never seen the various corrections, but the
correction of whom doesn't do much for undercutting the
general conclusion he was trying to reach.

Also, Pascal and Lewis are both colorful apologists representing distinctive periods of Christian history; yet Pascal may not be considered so 'ancient' by some readers as to be emotionally discounted (besides which he's widely respected in fields other than religion, such as mathematics, and so might have some prima facie credentials for some people on that score.)

Finally, I have a tendency to quote from whomever I'm currently reading in my spare time, and it happened to be Pascal when I first drafted Chapter 1. Lewis I read more-or-less constantly, so expect to see his tools in my work on a proportionate basis!

YOU WOULD RECOMMEND LEWIS OVER PASCAL?

I certainly would as a systemetician; and it should not be surprising that theologians have a tendency to improve over time. We've had a couple of thousand years to polish the details! Pascal is worth reading to see where we have been, and to detect some of the grounds from which modern theologians work. His chief attempt at Christian apologia, the _Pensees_, was never finished or collated in his lifetime, and remains a rather scattershot effort; also it relies overmuch on what would today be considered grossly outdated Scriptural exegesis (the point being that we have many more reasons today to trust Scripture's historicity, from a historical standpoint, than Pascal did. Pascal would probably agree with me, as he trusted Scripture's historicity primarily on his faith in God, though he apparently thought that its historical claims were self-evident enough to be useful for apologetics to unbelievers.) Pascal also has a tendency to hare off into what we would consider socio-political topics (e.g. anti-Jesuit polemics), though since these involved the Catholic church they were for him religious by default. Pascal's greatest apologetic strength, in my opinion, lies in the frightening clarity with which he perceived and sympathized with human thought processes of various types. Reading the _Pensees_ gives me the impression of a man whose mind is bursting with points that are coming just a little too fast for him to handle. Hearkening back to an earlier metaphor, I consider him a shotgun of Christian apologetics: sure, a bunch of the pellets miss (his understanding of Islam, for instance, is still rather ignorant; though amazingly open-minded and fair when you consider his historical contexts), but the ones that hit are worth paying attention to! Also,

I respect him as an apologist who wants very much to mend
the perceived breach between 'faith' and 'reason'.

WHAT DENOMINATION ARE YOU AND TO WHAT EXTENT DOES IT AFFECT
YOUR ARGUMENTATIVE PROCEEDURES?

I was raised a Southern Baptist in a moderately
conservative church. However, when engaging in apologia I
find what Baxter (and Lewis after him) would have called my
'mere' Christianity coming to the forefront; it is, after
all, more important and I don't want to confuse
intradenominational particularities with the Gospel. The
two particular Baptist doctrines which show up in any
apologetics I write are likely to be my belief that in a
fallen world like ours the Church should not be given the
power of the State, and the State should not be given
powers of the Church; and that all believers are under a
Divine injunction to seek, as part of a relationship with
God, the best understanding of Him that they can (meaning
that in the last resort an individual is personally
responsible for the doctrines he advocates.) However, I try
very hard not to base arguments _on_ these positions; at
least not among non-Baptists.

Meanwhile, I have no particular animosity toward other
branches of Christianity; I am, for instance, always
willing in principle to heed and support the Catholic Pope,
though I do not accept the doctrine of his infalliability.
Obviously, general support does not entail particular
support of all particular Papal positions, or even that I
generally support all Popes through history; some of them
were obviously quite wicked and corrupt, abusing the
authority which God and/or the Church (depending on what
theories of authority transmission hold true) had given to
them. My opinions about authority figures in other
denominations are similar in character, of course; I
generally give them the benefit of the doubt until I have
good reason not to support them, either on particular
issues or as particular individuals.

WHAT WOULD YOU DO IF CHRISTIANITY WERE ONE DAY PROVEN
FALSE?

Deal with it, I guess! It certainly wouldn't be very fun.
As the years go by, my confidence in Christianity's general
validity continues to increase steadily, and I certainly
think I'm having a personal relationship with God; so I'm

not terribly worried about the concept of being proven
cataclysmically wrong someday. Then again, I expect Mr.
Dawkins isn't, either! Sauce for his goose might be sauce
for my gander.

Otherwise, the answer to that question depends on the
extent Christianity were ever "proven false". For
example, if the divinity of Jesus were ever proven to my
satisfaction to be historically invalid, I would still be a
trinitarian monotheist concerned with the divine redemption
of humanity from our sins, since (even minus the historical
particulars) I find this a very defensible logical stance.
If someone could prove logically that God must not be
trans-personal, I might accept some form of Judaism or
Islam. If monotheism were somehow thoroughly tossed as a
concept in some fashion from which I couldn't honestly and
logically recover it, I expect I'd become some sort of
Nature-worshipper, probably along a Celtic line--but by
that point I'd be 'religious' purely for aesthetic reasons,
meaning that at bottom (whatever trappings I adopted) I'd
be an atheist.

However, I'm a long, looonnnng way from any of that! I find
the Christian philosophy (as well as theism in general) to
be very strong; I find the historical arguments to be
increasingly validated; and unless I'm willing to
arbitrarily call my religous experiences 'subjective', I
find myself in a growing personal relationship with what I
can only describe as the God in Whom Christians believe. I
won't be indulging in any fertility orgies anytime soon (as
attractive as some of them might be to my nature!)

DO YOU HAVE ANY PROFESSIONAL CREDENTIALS FOR THIS SORT OF
BOOK?

None in the least. I have no theology degree, no philosophy
degree, no biology degree, nothing to justify. This is the
first book I've ever written. My only credential is that I
suppose I represent a member of the audience for whom Mr.
Dawkins was supposed to be writing TBW. I know this is a
defect in some ways; but on the other hand maybe it will
allow readers and critics to judge my ideas as they are,
and not as being part of so-and-so's class. (I find myself
occasionally prejudging some scholars on that amorphous
ground, so I know it's a live issue!)

DO YOU REALLY LIVE IN THE "BACKWOODS"?

I live in a small West Tennessee town of roughly 2700
people. To me, this is not the backwoods (I live in a nice
house on a well-lit street on the edge of town with
cultivated land and other nice houses all around me.)
However, the label "backwoods" can be somewhat dependent on
perceptions, so it may fit. I know people (and know of more
people) who live nearby in what _I_ would consider the
backwoods--though I expect most of them would claim that
even they don't rate as backwoodsmen compared to isolated
communities in the hills of East Tennessee (much less the
Rocky Mountains in the Western United States.) I think I
can safely assume, however, that I have people in my
immediate acquaintence who would be considered "backwoods"
by Mr. Dawkins and his ilk. I'm certain my parents and
grandparents (and most of their contemporaries) would fall,
or would once have fallen, into that class. The mere fact
that we have a thriving Mennonite commune here in town
would consign us to the "backwoods" in many people's eyes!

Mainly, though, I find it somewhat annoying that Mr.
Dawkins lectures us on the inappropriateness of
cariacturising backwoods Australians; but feels no
compunction against doing so himself by equating
creationistic theists with naive "backwoods"-types--one can
almost hear him adding 'with not much under their hats and
fishing hooks dangling around the brim.' (I suppose, in
that vein, Asimov's praise-blurb for TBW and against
creationistic 'cavemen' is in keeping with the book's
tone.)

AREN'T YOUR OWN CONCLUSIONS ENDANGERED BY YOUR THEISTIC
PRESUPPOSITIONS?

It is, of course, a fact (often overlooked by people who
should know better) that everyone embarking on a work of
this (or any other) sort will have a notion where the work
is going to carry them. We all have an agenda; in and of
itself, I have no problem with this, else I'd be refuting
myself since I am a confessor of (and to) Christ. However,
there is a difference between working toward a target
conclusion, and using as a necessary presupposition the
target which is supposedly being concluded. Given that I am
a Christian, I have at least an epistemological (and I
would also say a moral) duty to argue in that direction. I
fully allow that Mr. Dawkins has an epistemological duty to
argue for what he really believes. All of this is perfectly

fine; even on the realization that we both can't possibly
be equally correct. The question is this: have I, at any
point (or at key points) in my argument _required_ that God
exists, and/or _required_ He have certain characteristics?
For example, when I point out that Mr. Dawkins uses
conflicting meanings of the word 'create' and shuffles
these meanings around as necessary to keep the appearance
of validity in his argument, did I require 'God exists and
has certain characteristics' to make this point? No, I did
not. There are, of course, a few places in SMB where I
broach topics which require, as a premise, God's existence
and (to one degree or other) certain particular
characteristics; but I have tried to flag those explicitly
and I have also tried not to hang any arguments against TBW
(or for theism) on them.

By contrast, when Mr. Dawkins, in chapter 6, explicitly
defines 'miracle' as something purely natural _before_ he
gets to work explaining why he believes Man's existence
does not depend on the miraculous (as against creationistic
theists), he has rigged the game by requiring as a
precondition, without which his argument couldn't get
going, the conclusion he's trying to reach. Creationistic
theists (or at least the vast majority of us) do not claim
that miracles are only vastly improbable natural events; we
think they're supernatural. Mr. Dawkins defines them as
not supernatural, and then (surprise, surprise) concludes
that Mankind is not the product of a supernatural designer.
Furthermore, I don't have to assert God's existence and/or
characteristics to point this out and refute his argument
on procedural grounds.

Therefore, though (being falliable myself) I don't rule out
the possibility that someone will find a place where they
can legitimately criticize me for begging my own questions,
I have at least tried not to give people grounds for doing
so. At the very least I can say that, if you're holding SMB
in your hands as a book right now, I've already vetted the
text past numerous correspondents with specific
instructions to hunt down such instances in my own argument
and alert me to them. I'm as confident as I can be that no
such problems exist in my book.

YOU ACTUALLY ADMITTED MAKING A MISTAKE IN CHAPTER 10! AND
CORRECTED YOURSELF! ARE YOU NUTS? WHY WOULD YOU LEAVE THAT
IN?

Because I'm trying to be fair and honest. I really did
write this book pretty much straight through, with as
little hindsight 'prediction' and 'analysis' as possible--
and where I did, I tried to label it as such. That being
the case, when I realized in Chapter 10 I had made an error
in interpretation, I was obligated to correct it, _and_ to
correct it publically. That's part of the whole point to
critical dialogue.

SOMETIMES IT SOUNDS AS THOUGH YOU BACK CREATIONISM, AND
SOMETIMES NOT; WHAT'S THE DEAL WITH THAT?

This ambiguity stems from several sources. To begin with,
what is called 'traditional' creationism usually means
accepting a literal 6-day creation event taking place
roughly 6000 years ago. Certainly, when Mr. Dawkins wrote
TBW, he was arguing against this theory to the best of his
ability. However, in the last chapter he makes clear that
he opposes any theory of origin wherein a transcendent God
designs and creates the universe. Mr. Dawkins' actual
remarks in TBW do not seem restricted to young-earth
creationism; he advocates against any theory requiring a
Designer. Since I obviously back the side which advocates a
Designer, I would fall by default into his "creationistic
theist" category, no matter what my particular opinions,
theories or beliefs about the matter are. I have tried to
design my refutation along lines that almost any
creationistic theist would accept, though I doubt I can
please everyone; and concurrent with this I have allowed as
much leeway for valid scientific discovery as possible. To
that end, I have tried to point out that even if the
universe is umpteen billion years old, even if the earth is
four or five billion years old, and even if the human race
is more than one million years old with more than one pair
of original species members--even then, a fully
supernaturalistic theology featuring a loving, judging,
omniscient, omnipotent creator God is not discredited. As
far as this general strategy goes, Mr. Dawkins seems to
agree--he can't just refute creationism carte blanche
merely by using radiometric dating. Otherwise his book
would be only three pages long!

My own opinion on the matter is somewhat in flux; I haven't
found scientific arguments for recent-creationism
particularly persuading, though they do at times make some
very interesting points so I'm not flatly rejecting it. I
haven't been particularly impressed with theological

justifications for recent-creationism, either. The only
attempts I've seen to conclude that the first two chapters
of Genesis are completely literal overshoot the mark in my
opinion by holding the chapters to standards of composition
and interpretation which the theorists feel no compunction
to hold other parts of Scripture to, up to and including
Our Lord's words themselves. Science (i.e., external
evidence) therefore seems against recent-creation to me;
and the language of Scripture (i.e., internal evidence)
seems to me elastic enough to allow for that
interpretation. However, I also want to point out that I
have no particular emotional or professional stake in the
matter to justify; which means that it would be fine with
me to discover more persuasive evidence for recent-
creation. Until then, I find it more useful to assume that
our scientific discoveries are valid (since that's what
most of my readers, particularly the sceptics, are going to
assume anyway) and stay on that common ground for purposes
of engaging in common dialogue.

DID YOUR BROTHER REALLY WIN THE TENNESSEE STATE LOTTERY?

No. We don't have a state lottery. That's why it made a
good example for the analogies with which I was attempting
to illustrate some of my argument.

Y'KNOW, I DON'T THINK YOU WORKED OUT THAT YEAR ESTIMATE IN
CHAPTER 9 VALIDLY...

Probably not! (please excuse the pun...) My point was that
playing the game by Mr. Dawkins' own rules (be they right
or wrong) doesn't get the result he claims it does. My
other point was that it's super-easy to manipulate
statistical calculations to come out any way we want by
making blanket assumptions, etc.--which we _have to do_ in
cases like this because we don't have anything like the
necessary knowledge to make precise calculations. And this
doesn't even count Mr. Dawkins' attempt to redefine
something in naturalistically probabilistic terms which its
advocates aren't claiming in their arguments (i.e.,
'miracles'.) I get nervous when my own side tries to use
probability estimates in an ostensibly strict mathematical
way, and you'll probably never see me actively arguing
Christian apologetics along those lines. The more respect
and understanding one has of mathematical probability
theory principles, the easier it is to see the huge
liberties taken in such endeavors.

WHAT'S UP WITH THE AMBIGUOUS TITLE OF CHAPTER 13?

It's a multi-layered joke based on the taunt of the Comte
d'Guiche to Cyrano de Bergerac, as translated for the Jose
Ferrer/Stanley Kramer cinematic production of Rostand's
play (available on videotape and occasionally rebroadcast
by American Movie Classics, in case you'd like to see it.)
Cyrano has been a thorn in the side of the well-connected
Comte (or 'Count'), and has just declared in no uncertain
terms that he intends to continue standing up to the
nobleman. The final exchange runs like this:

d'Guiche: Have you read _Don Quixote_?
Cyrano: I have, and have found myself the hero.
d'Guiche: [snidely ambiguous] Be so kind as to read once
more the chapter of the windmills.
Cyrano: Chapter 13!
d'Guiche: [annoyed brief pause, then forging ahead]
Windmills, you remember, if you battle with them, may swing
'round their arms and cast you down into the mire!
[triumphant finish]
Cyrano: [grandiose gesture] Or, up... among the stars!

Reviewers may now proceed to psychoanalyze what I intended
to emphasize from this, how it relates to my swordfighting
hobby, the futility of jousting with Mr.
Dawkins/evolutionism/naturalism, etc., etc., ad nauseam.

DO YOU RECOMMEND ANY BOOKS ON BIOLOGY OR EVOLUTION?

Yeah, all of them.

Seriously! Despite my occasionally astringent attitude here
in SMB, I'm very much in favor of people reading as much
about any science, including biological evolutionary
theory, as they feel comfortable with. However, I'm also in
very much in favor of people taking the time to work
through what the authors are saying; we should take an
active role in reading. I guess I'm something of an
optimist in this regard: we nonprofessionals may not have
the access to check the purported raw facts, but by default
we have access to the authors' _arguments_. We can check
those; and if we find them self-consistent, I think it's
sensible to give the authors the benefit of the doubt
(provisionally, at least) regarding the raw facts
presented. That way, we ourselves voluntarily share the

responsibility of sifting the good arguments from the bad;
toss out the bad, and make full use of whatever good you
find. (And you should note that this applies just as well
to my own book!)

Other than that, I've left out examples of
biology/evolutionary books for two very good reasons:

1.) I haven't read many of those sorts of books. That's why
I'm a member of the supposed audience for whom TBW was
written; I can do a self-consistency check on TBW without
being unduly influenced by any of Mr. Dawkins' professional
rivals. Anything I know about biology and/or biological
evolutionary theory, I know from twenty years of grade-
school/high-school biology; Discovery Magazine articles;
newspaper articles--in other words, the general layman's
exposure to the field. If it seems like I have a fairly
good grip on it notwithstanding, I should hope that's
because the whole _point_ to magazine articles, newspaper
articles, and books like TBW, is to educate the masses with
true and useful information on Subject X. Otherwise, those
authors would merely be contributing to an exercise in
creative cynicism! If I seem thoroughly ignorant and inept,
it's possible that this might stem from rank
inconsistencies and bad argumentation from the experts in
their popular works. I'm only as good at this as Mr.
Dawkins can teach me to be; but he's got to be self-
consistent for that to work--and I don't have to be an
expert in biology to check for his self-consistency!

2.) Even assuming I had a list of 'biology works cited',
any such list would almost certainly give the impression of
recommending one school of thought over another. I'm not an
expert; I have no useful opinion to give about that. I'd
much rather feel confident that my readers were capable of
getting anything useful out of anything they read
themselves than for me to opine on the relative quality of
books outside my own limited field of expertise.

ARE YOU MAD WITH GOD FOR LETTING YOUR CAT DIE?

Of course not! My cat lived much longer than she would have
lived in the wild; was most probably more satisfied (she
had a constant supply of food, water, and affection when
she wanted them, and suffered less sickness than would be
expected thanks to vetting); and died in a relatively quick
manner rather than slowly from exposure to the harsh

elements of a West Tennessee summer or winter. (I'm highly allergic to cats, though less so than in the past, and bringing her inside has never been a viable option.) Remember that most Christians (at least the traditionally supernaturalistic kind, though perhaps not the more modern 'liberal' merely sociological kind) think that nature, though originally perfect, has been corrupted due to the influence of powerful evil supernatural entities; and that one result of this is the traumatic-yet-physically-necessary death of individuals. (This is only a problem for conscious entities, as unconscious entities by default have no perceiving 'self' to feel pain, though they will usually express the physical reactions to pain-giving stimuli which we would associate with 'a painful experience' were we in their position.) The relatively neutral properties of nature which make it possible for us to express ourselves and otherwise interact with one another also make it possible for us to hurt and suffer.

Now, it is certainly true, given any theistic view, that God set this up and allowed the system to be tampered with; and so you may without gross absurdity say that if He exists He ultimately must be responsible for the suffering and death of the people and animals we love (including ourselves.) And however well theists explain the necessity of the characteristics of the world we live in (these explanations with respect to God are known as 'theodicies'), we always must face up to that underlying fact: life now hurts, people and animals suffer and die in ways which they certainly seem not to have deserved as far as we can tell, and God is responsible for the overall situation. How many of my readers, I wonder, believers and sceptics alike, have shaken their fist at God through their tears and screamed black bitter grief for what God allowed to happen? I wonder how many of my readers have rejected God, or at least the sort of God Jews, Christians and Muslims believe in, because of their experience with this pain? Quite a few, I suspect. But let me point out two things:

a.) What is the basic assumption underlying any argument from pain? That it is certainly, objectively _WRONG_ for entities that can suffer to suffer a pain they have not earned. (I think most of us will agree in principle, though perhaps disagree in particulars, that it is not wrong for an entity to suffer if that entity has 'earned' it!) Thus (according to this argument), there must be something the

matter with any theory which concludes that a good, loving
God creates and sustains us. Either He is ethically
netural; or He has an equally powerful rival which is
actually responsible for this; or He doesn't exist; or He
is evil. The first and third options give us an ultimately
ethically neutral universe; the fourth option gives us an
ultimately evil universe; and the second one ends with good
meaning only 'the sort of thing which that particular Being
does', which at best gives us an unknowably arbitrary
behavior--and which is functionally neutral at bottom.
(Perhaps a simpler way to put it would be that the two
equal powers cancel each other's influence out for purposes
of being a reliable standard of judgement.) So, we have
three neutral options or an evil option, but not a good
option like the creationistic theists claim.

The problem is that for this argument to work, your
perception of the situation must be objectively correct (at
least in theory.) That is, your idea of ethical 'wrongness'
must be potentially correctly comparable to a really
existent standard of 'good', by which you can compare. If
what you consider to be 'wrong' in undue suffering isn't
really 'wrong', then the argument against God's existence
and/or character from this direction falls to pieces. The
three theories which supply an ultimately neutral universe
don't supply this standard. Even the cosmic dualism can't,
because the actions and intentions of the two equal deities
are only labelled 'good' and 'evil' out of convenience--
typically out of convenience to our individual aesthetic
preference (or practical preference) of their actions.

The theory which posits an evil creator leaves us wondering
what it is that we seem to be in revolt against; it hardly
seems likely that an ultimately evil entity would allow as
much apparent goodness as we find in the world, much less
let down his own pride and self-centeredness long enough to
create anything other than Himself and allow it freedom. A
good being might allow this freedom (with its inherent risk
of evil) in order that the creatures may freely return real
love to Him, rather than just go through the motions.
Perhaps an evil God might allow a limited creation for
purposes of producing entities that could suffer; but then
why produce vast quantities of nature which have (as far as
we can tell) virtually no bearing on that score?
Traditionally we have considered such an endeavor
explicable in terms of artistic drive, which we consider a
good thing (as far as it goes). That's why the argument

from design seems to work so well, despite its many
problems. Let us say, then, that out of the four apparent
options, three of them end up with a real, objective good,
transcendent of all realities against which the state of
realities may be effectively 'judged' in a meaningful way,
sneaking in the back door again. The argument against the
God of the Big Three Theisms, on this ground, leads us back
to that same God. And the fourth option gives us a
situation which doesn't seem to fit the data very well; but
let us hold off on taking it out completely yet--not
fitting the data very well is not a fatal self-
contradiction. So perhaps it is still a viable option,
though we may have to admit that the Good Creator
hypothesis fits the data better.

b.) But does the Good Creator hypothesis fit better? After
all, you say, none of this changes the fact that the God
Whom we claim to be so good, and to be the standard for our
ability to judge 'goodness', nevertheless is ultimately
responsible for what certainly seems like massive amounts
of undue suffering. Is it right that His creatures should
pay dearly for the sort of universe _He_ wished to create?
He certainly didn't consult the little girl who was raped,
tortured and murdered before designing reality, did He?
Would she have wanted to live on those potential terms,
even presuming she received a martyr's reward?

I have a great deal of sympathy for this claim. Along with
some less emotionally charged, 'drier' philosophical
problems, I think it comprises the strongest of arguments
against the existence and/or characteristics of the sort of
God we believe in. Well, almost. I have no idea what I
could say about this if I were a Jew, or a Muslim. But what
looks like the strongest possible claims against
monotheism, I have discovered, become in turn some of the
strongest possible points of Christian trinitarian theism.
Let's be frank; in our heart of hearts, we want God to own
up and take responsibility and--to be blunt--_pay_ for
putting us and our loved ones through this sort of world.
But there is only one theism in the world which claims God
Himself, the final responsible party for the world's
condition, has done just that. Christians think that God
plays by His own rules and His own terms. He didn't just
institute a set of conditions (even if otherwise defensibly
necessary) and then tell us in effect "You'll eat it and
like it, because I brought you into the world and I can
take you out of it again, you ingrates." Instead, He's trod

the trenches with us. He humiliated Himself to be born, live, suffer excrutiatingly and unfairly (even had Jesus been merely human, the legal case against him held no water under Jewish or Roman law, as Pilate himself well knew), and die with us. God's answer to the shrieking grief of a mother who demands He be held accountable for the condition of the world is a rough wooden stake; a crown of thorns; thirty-nine lashes with rawhide thongs embraided with small metal balls and pieces of bone (a Roman scourging was quite capable of opening the back all the way to the exposure of the kidneys and spinal column, and extended from the neck down to the legs); the mockery and derision of His chosen people; three thick metal spikes hammered into the medial nerves (those are the nerves which hurt so bad when you strike your 'funny bone'); six hours of slow suffocation; and a heart exploded from pericardial fluid buildup and hypovolemic shock. That's on top of any mystical unimaginable suffering He endured for 'taking on the sins of the world' and such. God let us crucify Him. The word "excrutiating" was in fact invented in those days because there was no adjective brutal enough to describe the pain inflicted by crucifixion. (The word's Latin root literally means "from the cross.")

There are, of course, several other reasons why Christians think this happened; but only a Christian can say, "The God ultimately responsible for my suffering has indeed paid for the world He made." I think this offsets any possible parity that we could spin out of the hypothetical 'evil God' scenario, even assuming we could get around the numerous technical problems surrounding the concept of an utterly evil being who nevertheless creates fully and freely.

YOU SEEMED TO BE HINTING IN THE LAST CHAPTER ABOUT FORTHCOMING BOOKS. MAY WE EXPECT TO SEE SOMETHING LIKE THIS AGAIN FROM YOU?

Not necessarily; though, who knows? Perhaps 'persistant criticisms' like this will become my signature style. I will be writing more books (publishing them is always another question, of course). I currently plan to present an attempt at a comprehensive Christian metaphysic sometime in the next few years; you've seen part of it at work here, obviously. There may also be a sequel to _that_ book, wherein I go back to pick up some spares and apply positions I've developed to the topics that divide us as

people. Obviously, my third book will be more speculative and personal than the first two (at least, I hope so!) I also plan to complete a commentary on the Gospel authors' use of Old Testament passages, particularly with regard to the material contexts; in fact, I've already begun this book and you may see it in print before anything else I have on the slate. While writing SMB, I've also been busy transcribing Krailsheimer's translation of Pascal's _Pensees_ into my computer so I can play cut-n-paste with them and see what sort of interesting argumentative sequences I can reproduce. However, I have no plans at present to write a book from this (though I certainly intend to use a few of the interesting developments in my Synthesized Apologia volume.) I have a few fictional and quasi-fictional ideas percolating, but I don't want to give anything away early. I have no plans at present to move directly to another persistant criticism project like SMB, though I'll be keeping my eye out for a suitable topic.

HEY, AREN'T YOU GOING TO TELL ME I SHOULD BECOME A CHRISTIAN?

Not here. If, for whatever reason(s), you feel like listening for a minute or two longer, turn to Appendix 2. Otherwise, make whatever good use you can of me, and thanks for taking the time to read this book.

Appendix 2: HEY, AREN'T YOU GOING TO TELL ME I SHOULD
BECOME A CHRISTIAN?

Okay, you should become a Christian.

Seriously, you don't need me to tell you what you 'should'
do. This is not really an evangelistic work; and I don't
expect this book to 'save' anyone. For that matter, I don't
believe any human work can 'save' anyone; only God can do
that (through Christ, I believe), and it's up to
individuals like you and me to accept or reject His hand
once we find it, on our own steam. The very most I expect
from this book might be to help you recognize that Hand
_as_ a Hand (and not, say, as a collective parental wish-
fulfillment delusion fostered by a species which naturally
rejects and competes with its parents--or some theory even
less consistent than that!)

However, since I don't presume to know all of God's plans,
and since the technical possibility remains that even a
single reader somewhere may find that this book fits in as
the last piece you need to convince you that you need help,
that God exists, and that He can help you; then I'll offer
the following points, for whatever you think they're worth:

a.) You've got to admit you need help. Don't get insulted;
we all need help, myself included. Sometime in the last 24
hours I've treated someone in a fashion which I wouldn't
want to be treated myself. Not only that, I enjoyed doing
it. I wanted to do it. It's not easy sometimes to figure
out when someone _else_ is acting in a truly evil fashion;
but it's not that hard for me to figure out when _I_ have
been acting that way. It may be _uncomfortable_, but it's
not hard. Furthermore, if I know I'm doing something that's
wrong, and God exists, then however I finagle it, that
action comes back ultimately to a break with Him.

b.) One of the things I've discovered by thinking about my
own behavior is that when I sin, no matter what I've done
particularly, I've always denied the reality of the
situation in some way. If you decide you need to do
something about actions you've taken that you know are
wrong, then one of the results will be that in fixing this
problem you'll be facing reality more directly and more
completely. This will make you even more of a realist than
you already are (however much that is). You probably know
already from your own experience that facing reality more

completely is rarely fun; you've also probably figured out
that it's inevitably necessary, because one way or another
reality _will_ be affecting you, and you're only crippling
yourself otherwise.

c.) You can't fix this problem yourself. Neither can I.
Don't worry at this point _why_ this is the case; if it
makes you comfortable to talk about spiritual entropy
rather than demons tampering with nature, then stick with
the physics imagery for the moment--it'll work just fine.
But I'm warning you beforehand that if you ever start to
get right with God, you'll be setting yourself up as a
target, and you're going to have a hard time discounting
the whole concept of 'demons' without summarily trashing
everything else you're accomplishing in your life. This is
not a game; and I'm deadly serious--I don't have space to
go into particulars, and if by now you still don't think I
have some idea of what I'm talking about, then I encourage
you to put down this book and find someone you _can_ trust.
Meanwhile, if you think you can fix it yourself, by all
means try; if you're honest, I absolutely guarantee that
you'll discover you can't, but this is really something
everyone has to find out for him or herself.

d.) God can fix it. Again, I haven't the space to go into
particulars about how and why this is possible; you've
perhaps seen a few things scattered here and there in my
book (or other books by other people) that can give you an
idea about the hows and whys, and I certainly urge you to
go look up the details. Right now, what you should have
figured out is that at least a part of you needs to be
killed, and you can't do it yourself.

e.) That dovetails three things together: you know from
your own experience that if you don't face reality more
efficiently, you're going to suffer hugely in the long run.
(You don't even have to believe in hell to understand
that, though you should be able to begin seeing how that
fits together, too, by now.) You know that you do things
which are wrong (you don't need the 10 Commandments or
anything in the Bible to figure this out); and if by now
you are willing to grant that God exists, that means you
need to repair a break in your relationship with Him--
which, among other things, means you aren't dealing with
reality as efficiently as possible. And you can figure out
by experimentation (if nothing else) that for whatever
reason there's something internally wrong with you that you

can't fix yourself, but that it must be fixed if you're
going to accomplish those other two things.

f.) And this is where I must part company with some of my
Jewish and Muslim brothers (though I hope they've found
some useful things, too, here and there in my book).
Obeying the Law (whatever aspect of the Law you can
discover) isn't going to save you. Only God can do that;
and He's offering it to you now. He's willing to forgive
everything you've done, if you're ready to be forgiven.
Yes, I know that sounds too simple; but please remember
that God is not stupid. He knows perfectly well whether you
want to be forgiven, and if you're thinking of making some
sort of spurious gesture, you can forget it. And that
doesn't abrogate the Law; He wants to help you fulfill the
Law (not necessarily the 'laws'), and you're still going to
have to work to do your part--in "good faith", if you'll
pardon the pun. You're not going to be perfect, yet; just
forgiven. But you will be entering a personal relationship
with God as a Person; and it doesn't take much imagination
to see that the end result of such a relationship will be
perfection for you. You won't reach it this side of death;
and although nothing will be able to snatch you from God's
hand, as far as I can tell you're still free to jump. So
this is not a one-time, patch-n-paste offer. It's a
personal relationship.

g.) Again, I have to part company even further from my
Jewish and Muslim brothers: God gives you what He has, not
what He doesn't, and He can establish a personal
relationship with you and me in an eternal fashion (i.e.,
in a fashion which transcends time and space and thus is
available to every person in history), because He entered
historical time and space as a person. He can help us deal
with the necessity of killing a part of ourselves (to put
it briefly) because He has that experience Himself as an
eternal part of His character, thanks to an historical
event which He chose to undertake as a human person. I
think that person was, and is, Jesus of Nazareth. This is
where the historical claims begin overlapping the
philosophical claims. However, whether or not you are ready
to accept this particular historical claim as the Redeeming
Incarnation itself, you should be able to see (if you've
gotten this far) what the concept of a 'Christ' means to a
Christian: a bridge, between you and God, by God and of God
and God Himself, for the reasons I discussed above. If some
things you've seen in the press lead you to question

whether the Scriptures make a trustworthy claim about
Jesus, then _I_ certainly am not going to blame you. (But
I'm also going to tell you that although they have some
valid points, mostly it's another huge methodological
shell-game. Again, you can either trust me on this, or
start doing the logical math on their claims yourself.)

h.) So, if you have gotten to this point, obviously you
have to do something. What? Like any other personal
relationship, you must communicate for it to work, and that
means you must talk to God. Yes, duh, He knows everything
about you already--that's not the point. Active
communication on your part is the point. This is not magic,
and I don't have a ready-mix catechism for you to
mechanically follow (though cathechisms can be quite useful
for doctrinal discipline). Nevertheless, if you've gotten
this far, you should be able to figure out that the first
thing you need to do is confess to Him that you've done
some things you know are wrong, and ask Him to please
forgive you. Be as specific as you can, because if you
intentionally dilute those rather concrete experiences (and
you should know what they are) you're trying to duck
reality again. But don't panic about trying to come up with
every little scrap. God isn't stupid; work _with_ Him.

i.) And keep at it. This is not magic; it's a personal
relationship. Talk to Him. When something nice happens to
you, thank Him. That pizza tasted good? Thank Him. Enjoy
that movie? Thank Him. He's got a certain amount of
involvement in every good thing, so recognize His
contribution; and I think you'll find pretty quickly that
you'll also be thinking about the other people who
contributed to what you just enjoyed. Ask Him to bless
them; and it won't hurt to go thank them, either, if you
can reach them! Of course, He's got a certain amount of
involvement in every tragedy, too; start looking for the
positive aspects of the problem, and tell Him what you
think about it. If you get mad at the tragedy, go ahead and
yell at Him; keep the lines of communication open. After a
while, when you calm down, go back and talk to Him about it
again. Not everything we call a 'tragedy' is His direct
action, though He allowed it (remember the supernatural
rebellion I briefly mentioned earlier). Try to learn
something from the experience. This is where your faith
will really come into play: is this really a new reason for
not believing in Him, or is it something you can't explain
fully at the moment? There's a difference. Do you make

accurate decisions when you're upset? If not (and I don't
know anyone who does), do your best to hold your ground,
and then come back to the issue later when you can tell
you're thinking more clearly. (It's not really that hard to
do, unless of course you commonly act in ways which
physically handicap that organ you use to think through!)
And, let's be fair: you may have a huge positive-emotion
blast of some sort when you start this relationship--or,
like me, you may not; it's not automatic, it's a gift. When
it's over, and you're thinking more clearly, go back and
make sure you did the math right. God's not going to fault
you for checking your sums, so to speak; that's how you
learn. Looking for an intentional 'out', like a divorce
after a snapshot Las Vegas wedding, is another matter, of
course: God is not stupid.

I know that everything I've discussed for this point is
going to sound just like some sort of lame psycho-babble
mental adjustment trick; and even some real psychiatrists
will have plenty of ways to explain the effects _away_.
That's not the question; the question is whether you
deduced earlier that God exists and you needed to do
something about it. You figured that out _before_ you got
to the prayer part, remember (assuming you've gotten this
far). If God isn't trying to communicate with us, then
frankly you and I and everyone else are all doomed anyway,
so you might as well try it and treat the results as if
they were at least partly reliable indications of something
other than the self-delusion that comes from having your
own imaginary friend. Whatever you do, please don't let a
psychiatrist tell you that explaining away prayer somehow
argues against the things you managed to figure out
before getting to the active communication part. If
you've gotten this far, I can guarantee one thing about
you: you didn't start believing in God _because_ you were
praying. That puts a big check on how far a reductive
psychological explanation can go in explaining (away) your
beliefs. There are certain things which psychiatry can
logically accomplish, and some things it can't. Disproving
God by illustrating that the effects of prayer can mimic
the effects of something else is not a goal psychiatry can
logically accomplish. For one thing, what keeps it from
being the other way around? (i.e., why shouldn't it be that
the effects of 'something else' happen to mimic the effects
of a valid prayer to an existing entity?) Keep doing the
logical math.

j.) What about the churches? If you're like most sceptics (recently signed-on or otherwise), you'll distrust them; and again, I can hardly blame you. The Church, despite what some of our more publically-minded speakers might have you believe, is not disparately scattered groups of people in disparately scattered buildings. It's the body of believers, total. If you're a believer now, you're in The Church (in the mystical sense, at least). You may not trust the churches, but you'll almost certainly want to find some believers whom you _do_ trust. Go ahead and look for them; don't get discouraged if you don't seem to find them immediately--you still have God, and you may find them finding you! (You may, in fact, start seeing all sorts of little coincidences, both for and against you. Be careful, of course, because this can lead to megalomania or a persecution complex; but if you've gotten to this point you should know by now that not all those coincidences are coincidences!) I'm a Christian who believes in the historical veracity (to one degree or other) of the New Testament; so I happen to think that you should partake of the Lord's Supper (or Communion, or the Mass, or whatever the believers around you call it) and be baptised, and make a public profession of your faith somewhere. These actions are not going to save you, as far as I can tell, but Jesus told us to do it; and for some rather complicated reasons (which I won't go into here), I think they have some positive effects on your relationship with God and other believers. However, you may not trust Jesus yet, as such; and if not, don't worry about it. Be clear _why_ you're not doing it, though; and be ready to do it if (when, I'd say) you are honestly convinced it's the right thing to do. Which leads me to...

k.) Find out as much about God as you can. I know, your life is pretty full as it is; most Americans (and Europeans and Asians and Australians and Africans...) have little free time nowadays. God isn't stupid; He knows how little free time you have. He wants you to work and to enjoy yourself, and He knows you have to do both. He also wants you to learn about Him as much as possible, and to do your best at everything. (I'm not presuming to speak prophetically; this is just a commonsense deduction from the given positions.) Try to keep a handle on the things you've already figured out; and keep doing the logical math when you look at claims. Again, this is not a patch-n-paste event but an ongoing process. There is a ton of information out there to sift through. Don't get discouraged, remember

the things you already have managed to figure out, and
(while keeping an occasional eye on them to make sure you
haven't made a mistake) use them as filters as you find
them to be reliable. I expect you'll start to see pieces
falling into place before long, as more and more things
come together.

l.) Finally, if you've gotten this far, remember that Mr.
Dawkins and I both agree heartily that people deserve to
know the truth. Don't worry for the moment about questions
like 'Will they go to hell if I don't tell them? Will they
go to hell if I tell them and it doesn't work? Will they
get into heaven anyway whether I tell them or not?' The
point is that, _whatever_ the case, people deserve to know
the truth. You can figure out the answer to those other
questions later; as important as they are, they're really
secondary to the key point--people deserve to know the
truth. If you agree, and you think you've discovered
something important, then you hardly need me to suggest
what you should do about it.

And let me end by stating that again: you don't need me.
Get whatever use you can out of me; love me as a brother;
whatever--you don't need me. I think you and I both need
God. But that's another story.