



Why Not Intelligent Design?

Post of the Month: October 2004

by [John Wilkins](#)

Subject: Why not ID [long]
Date: 4 October 2004
Message-ID: 1g1514g.1pxsan1sc71byN%johnSPAM@wilkins.id.au

A talk I shall be giving shortly. Comments welcomed.

Why not Intelligent Design?

John S. Wilkins

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Introduction

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This article will cover a bit of history, a bit of philosophy and a bit of biology. The history is crucial here - if we want to understand why the argument for or from design has such strong grip on our thinking, it helps to know how we came about it. In this talk I am not arguing that God does not exist, nor that anyone who believes in God is in conflict with science. The Intelligent Design (ID) claim is that there is nothing religious about ID, and that if the ID hypothesis is adopted we will make progress in science that we cannot otherwise make. In particular ID is based on the supposed inability of modern evolutionary theory to account for aspects of living things, but we will not deal with that here; each of these so-called "challenges" has been rebutted elsewhere. Here I am only concerned with the positive claim, so far as I can reconstruct it, that ID is supposed to offer us.

I will argue for these conclusions:

1. ID is a form of theology, not science
2. The only feasible Designer is, in fact, an omniscient God
3. If adopted by science as a working hypothesis, ID would halt further progress
4. ID is the latest teleological anthropomorphism. It is not even good natural theology.

I must state at the outset that I am not trying to argue against the existence of God, nor that belief in God is somehow irrational. I am an agnostic - I truly do not know if a god or a designer exists or not. That is not the point here. All we are concerned with is the question, "should Intelligent Design be included in science?"

Core problem: Anthropomorphism

Microcosm/Macrocosm idea

From the early Greeks there has been an analogy between human behaviour, psychology and structure, and the world. The universe is a "large organism" while the human is a "little universe". This idea, first clearly stated by Plato, and named by Aristotle the macrocosm, became important through the later Classical period in which neo-Platonism arose, and it was a doctrine of Plotinus'. This matters in part because these ideas were influential at the start of the scientific revolution. It appears in other, non-Western traditions, particularly the Tao, too, and also throughout the middle ages, in alchemy, astrology, the magical tradition, and the renaissance, as well as Gnostic religions.

Plato's claim in the *Timaeus* was that the Creator made humans perfect, as perfect as the universe, and hence perfectly adapted. As the world was a sphere, so was the perfect human. He needed no eyes, ears or digestive system and fed on his own waste. This was because a perfect being had to be self-sufficient. In fact, Plato believed that we, as we are now, are imperfect, bad design.

Plato said, "Such was the whole plan of the eternal God about the god that was to be, to whom for this reason he gave a body, smooth and even, having a surface in every direction equidistant from the centre, a body entire and perfect, and formed out of perfect bodies. And in the centre he put the soul, which he diffused throughout the body, making it also to be the exterior environment of it; and he made the universe a circle moving in a circle, one and solitary, yet by reason of its excellence able to converse with itself, and needing no other friendship or acquaintance. Having these purposes in view he created the world a blessed god." *Timaeus* part I, sect 5.

Plato's designed human is a self-contained sphere, revolving around its own axis just as perfectly as the universe does. It comprehends all living things, and is therefore like the universe. Thus was the microcosm/macrocosm distinction born.

Projecting our properties onto the known world

The Greeks thus *started* with an assumption that the world and we have some resonances, that we are to our parts as the universe is to its parts, and so forth. This projection of human properties to the wider universe is called "anthropomorphism" - the making of things that are inanimate out to be like human organisms. The problem with anthropomorphism is that it begs the question of how the universe is. If the universe is unlike human nature (or if humans have no universal nature) then the question of how we know the universe at all arises, but that is insufficient to support assertions about how the universe must be. Arguing from what we can know to what must be is a category error.

Fails to make a distinction between what is (ontology) and what can be known (epistemology)

The Greek analogy is a core error, repeated throughout western thinking. It fails to distinguish between what exists and what we can know. Because we understand ourselves (so they say), anthropomorphisers believe that like can only be known by like, and so from what we know (the nature of some things) they conclude that all things are like us. This would be a logical fallacy - affirming the

consequent - if it were a logical inference, but it isn't, or it wasn't in their time. It is, instead, a *premise* for the philosophising and science that follows the early Greeks. The assumption that living things and the universe alike had a nature is not a conclusion at this time, but a commencement point based on its sheer obviousness. It is a basic intuition, they might say.

Organicising the world has another implication, too. It means that anything that is true of living things, of organisms, must also be true of the whole world, including living things. So there is a functional harmony in the world that is like the functional harmony of organisms. It follows from this that any conceptual or logical notions we may need to explain the properties of living things, we need to explain the properties of the wider world too. And vice versa - if we use it for the world, we must use it in explaining living beings.

Now back then, this was defensible; we mustn't criticise the ancients for not being moderns. Whether it is defensible now is another matter.

Design - a final cause?

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It is a correct position that "true knowledge is knowledge by causes." And causes again are not improperly distributed into four kinds: the material, the formal, the efficient, and the final. But of these the final cause rather corrupts than advances the sciences, except such as have to do with human action. [Francis Bacon, *Novum Organon*, aphorism 3]

Aristotle famously used a form of explanation we now call "teleology". He did this because, in the case of living things, he felt they did and had things in order to attain an end. This, he called the *final cause*, and the ends in question were life itself. Now Aristotle was careful, so far as I can tell, to restrict this to the living world; he was not a macrocosmist. But others were not so careful, and in the synthesis of Plato and Aristotle that became neo-Platonism, all things were amenable to a final cause explanation.

Acts of intelligence were seen as the paradigm of final causation - if I have a reason to do X, then I am doing what I do in order to achieve X. It follows that if the universe is amenable to final cause explanations, as the argument from design from Cicero to Paley assumed, the universe must be like, or caused by something like, a mind. And this, of course, was what Plato thought. In the hands of the Christian and Islamic theologians, this of course became what we now know as the Argument from Design (or the "Fifth Way") in Aquinas' *Summa*, 1.Q2.iii:

The fifth way is taken from the governance of the world. We see that things which lack intelligence, such as natural bodies, act for an end, and this is evident from their acting always, or nearly always, in the same way, so as to obtain the best result. Hence it is plain that not fortuitously, but designedly, do they achieve their end. Now whatever lacks intelligence cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence; as the arrow is shot to its mark by the archer. Therefore some intelligent being exists by whom all natural things are directed to their end; and this being we call God.

Hume neatly disposed of this in part 2 of the *Dialogues*, but it had been criticised well before him. It affirms what it sets out to prove, that a cause must in this case be intelligent. But the thinking that underlies it which we now, following Christian Wolf and Kant, call *teleological thinking*, was the foundation for a tradition known as Natural Theology, which aimed to uncover aspects of the nature of

God from consideration of the nature of Nature, which God created.

Teleology useless in physical sciences

Teleology was abandoned by those who called themselves empiricists from Bacon on. It was nonexplanatory to say that an object "desired" to attain its natural place and that was why things fell. Newton replaced that with a simple description - any two masses attract each other. No intention; that is just the way things behave. It became the program of physical sciences to avoid any kind of teleology from that time on. Famously, Newton had God intervene to maintain the stability of the solar system from time to time; later, when Laplace showed that Newton's own equations implied that the solar system would be stable, he said to Napoleon that he "had no need of that hypothesis". Intentions, including God's, were not an explanation in physics.

Teleology not helpful in biology

However, in biology it remained true that explanations were often made in terms of what the ends of the organism or species or God were. Those who opposed this were called "materialists" and included figures like Goethe, Buffon and Lamarck in the 18th century. Kant went so far as to say that teleology was irreducible in thinking about living beings.

From the early 19th century on, teleology was progressively abandoned, including in the way that Darwin was understood. It was less explanatory to say that something was as God intended than to show how the physical and ecological relations of the organism made the processes observed likely or even necessary. Throughout this last century, teleology has not, to my knowledge, advanced biological thinking at all.

The recognition that living beings were well-adapted, though, led natural theologians from John Ray to William Paley to assert that this marvellous fact, and it is marvellous, could only be accounted for in terms of the design of God. Darwin famously undercut that inference with natural selection, but it remained true that biologists were in awe of adaptation. Dawkins himself has called his views "modified Paleyanism". Modern evolutionary theory may be divided between those who agree with Dawkins, Darwin and ultimately some aspects of Paley, and those who rather prefer to lose all hints of teleological thinking. One area where teleological thinking *does* apply, of course, is in consideration of goal-directed behaviour - that is, in thinking about human behaviour. There may be some others, depending on how we assess non-human animal behaviour.

Analogy with human design

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Powerful and protean and far from being banished from secular science, the argument from design is ubiquitous. Perhaps because we are creatures whose existence and survival depend on our ability to discern regularities in our surroundings and in turn leave our mark, our design, on them, we tend to infer prior design or intent from observed regularity. We formulate, that is, a descriptive rule, which is a form of knowledge, and infer from it a prescriptive rule, which is separate from the processes we see and controls them. [Susan Oyama]

The argument from design has been inverted in the modern account of ID. Instead of arguing from the *premise* that the world is designed to the conclusion (and explanation thereby) that a given organism or adaptation is designed, they now want to argue from an analogy between the organism and the products of human design to the *conclusion* that the world, or at least the living world, is designed. And this analogy is critical to the inference. All of the fancy mathematics presented by Dembski and his cohort at the "Discovery Institute" relies on an argument that, in the end, some things just *look like* they are designed. It is this argument I want to discuss now and to reject.

Consider the analogy that is being made. Start with human design, which is the only agreed kind of design process we know. In human design, one might think that there is something magical going on. We think things through, employ the resulting design to meet our goals, and we have made something new. Genius lies in being able to think things through *really deeply*.

This is a complete misunderstanding of how design really works in human culture. If we do mentally plan something, there is no guarantee that things will work out as we have conceived them. The test pilot who gave his name and rule of thumb to Murphy's Law knew this - anything that can go wrong, will, and at the worst possible moment. This is why there are test pilots. This is why human designers test their designs. Anything that is done mentally that does work first time has to be based upon past experience, of the designer or others who taught the designer. The fellow who designed the Soviet rockets, Sergei Korolev, based his work on that of the captured German V2 builders, as did Wehrner von Braun in the US. Even so, a good many designs failed on the launch pad, one catastrophically killing Korolev and ending the Soviet race to the moon in 1966. If design were a magical process, this would never or rarely occur, and never due to failures in the design.

Human design by trial and error

Human design, what I call *ordinary design*, is a process of trial and error, and passing on successful approaches to students. In this respect it is exactly analogous not to divine creation, but to natural selection. Each time something is thought that might work, it relies either on past experience, that is, trial and error, or some leap, large or small, that is not guaranteed to be successful until it is tried out. Individually we learn by personal experience; corporately we learn by the experience of many.

This is as true in engineering, science, medicine and technology as it is in graphic, cultural, and musical art.

Let us consider what it is that is being predicated of our Cosmic Designer, what I call the process of *rarified design*.

This designer, we are told, is unknowable. We merely know there is design if there is some measure of "specified complexity". We know nothing about the design itself, about how it was implemented and when or where, nor anything about the nature of the designer (for ID is very careful, except when it isn't, to not name the designer as God unless they are talking to a church group).

The design is utterly unlike human design. It does not involve trial and error or learning. It does not result in simple task-directed machines. It does not involve simplicity (less is decidedly *not* more in rarified design). Human designs are fragile - they work only in the conditions for which they are designed, if they work at all. Rarified design is robust - it works in many conditions. Ordinary design requires tinkering to keep it working - you have to repair human designed machines after a while, or

replace them. Rarified design is self-correcting, self-repairing, and self-producing.

At what point are we going to say, "there is no analogy here"?

How many designs?

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Two designers for Old World and Austronesian fauna?

When Darwin, on the voyage of the *Beagle*, visited Australia in 1836, he remarked that he might almost suppose that one maker had made the fauna and flora of the rest of the world, and another maker made Australia's - "An unbeliever ... might exclaim 'Surely two distinct creators must have been at work'", he mused in his diary. The morphology, ecology and physiology of Austronesian fauna were so different that Darwin's colleague Wallace described the region as a distinct ecological region. Despite a few similarities of outward form, such as between the marsupial "wolf", the thylacine, and the placental wolf, they were clearly very different in construction and design.

When biologists went to the New World, that is, the Americas, they were able to find analogues for most plants and animals, at least until the tropical regions were properly explored. But when they came to Australia and Papua New Guinea, it became really hard to infer something about the universal nature of the designer. It really *did* seem like there were two different designers in play. So are we going to have to assume that Australia was the special project of a junior designer? Maybe the Designer had a teenaged child who begged to be allowed to create something that the parent ended up allowing them to.

It gets worse, though...

A designer for every species?

How many designers are there in the world? Richard Dawkins once asked what God's Utility Function was (and he answered it as "maximising DNA", but we can overlook that for now). Let us ask a similar question: what is it that the designer of any given species seeks to achieve? What is the design goal? It is clearly the survival and reproduction of members of that species. But the survival of members of one species can often mean the death of members of another. Gazelles are designed to evade lions, and lions are designed to catch gazelles. It seems to me that if we were truly wedded to the idea of a designer because of the complexity of a particular form of organism, we must make recourse to as many designers as there are mutually antagonistic designs.

Richard Hoppe has parodied ID (<http://www.pandasthumb.org/pt-archives/000509.html>) this way by proposing the Multiple Designer Hypothesis (which he claims has as much right to being treated seriously as the Single Designer theory). Under the post hoc view of evolution - that those forms survive and reproduce which become adapted to the challenges they face - there is no need for a single particular goal for each organism. All organisms "struggle for life" as Darwin put it. But under Designer Theory, there is a problem.

Of course this is only a problem for the monists - those who have a *prior* commitment to there being a single designer. And the only reason for that assumption is some prior belief that only one designer is required (such as religious belief). But we are told by the ID crowd that the designer need not be God;

he might be the Raelean alien. But what we must account for is the inconsistency in design goals, one way or the other.

The inference from a "design" to a design goal, and hence to a designer, is rather attenuated. If we have no criteria for identifying design goals other than them being what keeps the organism alive, we end up with many designers, many goals, many design criteria, and ultimately it is simply a restatement of the evolutionary notion of fitness. A "design" is something that makes an organism fit, that is, able to live and reproduce. But we already have an account of fitness, and it doesn't involve designers, or even, really, design: natural selection.

One other approach that might seem to support design in organisms is to consider "body plans" - why insects have a similarity of structure, scorpions another, and of course vertebrates yet another. But developmental genetics is undercutting a lot of the qualitative differences here - similar genes cause the development of all animals at different points. This, too, is explained by common descent, and not by design.

So we are left with only the *appearance* of design, all of which evaporates as you try to grab hold of it, becoming ordinary evolution on closer inspection.

How Intelligent is the Designer?

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A question not asked, at least outside theological contexts, by the ID supporters, is how it is that the Designer knew what to do. Remember, ID does not *require* an omniscient, omnipotent, supernatural god to be the designer. I want to argue now that in fact for it to work as advertised, ID does in fact require such a god, and moreover that this leaves us unable to do science. In short, ID is just theology, and not even natural theology.

Humean problem of induction

Hume pointed out that we can only make inferences about the unknown on the basis of the known, and on the assumption that everything will remain uniform. While Hume was supposing that this meant the laws of physics won't change, it also applies in more restricted cases - in order to apply our models of how some phenomena are generated to a new case, we have to assume that everything remains the same. And the test, the proof of the pudding, is in the eating. If a model fails to apply, scientists will try to work out whether the model is wrong, or incomplete, or if there were unknown forces in play that we didn't know about; in short, whether things really were uniform.

Now suppose we are this Designer. How do we know what will work out in these very complex cases? If the Designer is not omniscient, then it is an inductive inference, working from what is known to what is not. And this has to be tested. The Designer cannot know ahead of time what conditions will apply, and so to "build in" special functions in living beings at the beginning of life involves cognitive powers that the limited kind of Designer cannot have. The future is too complex to work out. So we either have to have a Designer who tests as it goes, or the Designer's work will not be as designed, will not meet the design goals, at some time in the future. As the claim is the aspects of living things *now* are designed, we might legitimately ask how a Designer at the beginning could have foreseen in detail what the functions of, say, a biochemical pathway, could have been three and a half billion years later. So the Designer can only test as life goes and conditions change. So, how is this different from an

evolutionary account? Parsimony suggests that we ought not introduce a Testing Designer when the unsupervised process of natural selection attains the same result. It follows that our Designer, to do the job he - sorry, *it* - is supposed to do, must be omniscient.

"Front loading"?

ID advocates call this "front loading" - the Designer *could* foresee what the functions of various biochemical processes would be, and set them up at the beginning in order to have them become used by later organisms. Now the combinatorial complexity here is huge. In a given litre of chemicals, there are some very large number of molecules, each of which has some astronomical number of possible combinations. In order to front load, the Designer had to foresee not only all possible combinations of molecules in organisms, but also in their environments, select the "functional" ones that met the Designer's design goals (excluding, for example, those that permit organisms to flourish in vacuums or on the surface of molten volcanic lava, or whatever it is he - sorry, *it* - wanted to exclude). Then it had to do this not only for a small volume of chemicals in solution, but over the surface of the earth for 3.5 billion years. If that isn't an omniscient supernatural being we're talking about, I'll eat my epistemological hat.

So I am pretty sure that the *only* way in which an intelligent designer hypothesis makes any sense at all is if we are talking about a God who is not limited by natural processes, time available, cognitive restrictions and so forth. And the analogy between *our* design and the design done by *that* sort of being simply fails. So the argument that there has to even *be* design fails. And in any event, given that we have a set of evolutionary processes that we have reasonable cause to think can arrive at these results, despite the failures of imagination of the ID advocates, it is *not* a rational conclusion to draw, except on theological grounds. It most certainly is not a scientific hypothesis.

But what would happen if we were to adopt ID as the basis for scientific research, for, say irrational reasons such as political influence over granting bodies? Let's investigate this a bit.

What does ID explain?

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First we have to ask of ID what it explains. Consider this - if we have something at one time that we cannot explain using a "natural" process, then we can explain it with ID. But if, at a later time we *can* explain it using ordinary processes such as evolution, then the ID explanation becomes otiose, unnecessary. So it is less preferred than a natural explanation. Now consider that there are broad swathes of the biological world we cannot yet explain. We do not know, for example, how the brain is able to learn language. We know something, of course, but at any point in the past 100 years there have been areas we couldn't explain. At any point, if we were to adopt ID, we could say that ID explains how language is learned in those areas that so far we had not uncovered a natural process. Let us call this the Designer Theory of Language Acquisition (DTLA).

Now, if at, say, 1900 the DTLA had been adopted by all linguists, we would not have uncovered Chomskyan "deep structure". If at 1960 we had adopted DTLA, we would not have uncovered the neural processes that we now *do* know about in language learning. And so on. At any single point, adoption of ID will make further investigation of unknown natural processes unnecessary. Imagine if ID advocates succeeded in taking control of funding bodies for research into these fields. It would result in a nice saving in any field that the ID advocates did not like, that is sure. And on their own

principles, since we cannot find out anything about the designer, anything about the design process used, nor anything about how it was implemented or even which bits of the currently-unknown aspects of the research topic are designed, the ID advocates ought to immediately call for a halt to research on anything they even remotely *suspect* might be designed.

Epistemic nihilism

ID is a denial that we can investigate the unknown. It is a "know-nothingness", an epistemic nihilism. Of course, the religious ID advocates wish to replace scientific knowledge with the knowledge of revelation or doctrine, and it is entirely their decision to do this - *in the classrooms of religious instruction and in religious contexts*. They may not do it in science, nor in science education. To deny that we can, by empirical investigation, find out about the world undercuts the very *nature* of science.

Now some ID advocates will propose a more moderate form of ID. All they want is that we allow that some things *might* be designed, and let science go as far as it can. This is admirable. It is, in fact, what many religions have been doing ever since science started making leaps and bounds. Let science explain what it can; the rest is God's... I'm sorry, the Designer's. But this is a Designer of the Gaps - in effect all you have is a way to paper over our ignorance. As science does more and more, the Designer does less and less, and of course eventually the reasonable believer must say that Design is not a scientific explanation at all, nor can it be. If it happens there are aspects of the world that we cannot explain through science, then they must remain unknown, for the ID hypothesis adds nothing.

Is it creationism?

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ID advocates often claim that theirs is not a religious approach, and even more that it is not creationism. One version of it that relies on no supernatural or preternatural capacities is provided by a group, one hesitates for a whole second before calling them whackos, called the Raelians. On their account, the Designer was in fact an entire race of UFO pilots who came to earth billions of years ago and set up life as we know it. So *they* are not creationists. However, their designers are less authentic - for a start anything they did will have evolved out of recognition as design (or would be, at best, recognisable as mere vestiges of design; molecular appendixes, as it were). More to the point, their Design Hypothesis cannot be adduced to explain *current* properties of living beings. So that claim, that there are aspects of modern organisms that can only be explained by a Designer, fails to work, as it must for any "deist" Designer, one who wound it up at some point in the past, and let it evolve from there onwards.

But those who adopt the "modern design" claim, must make recourse, as I have argued, to an omniscient Designer, or, in other words, God. And this is not explanatory, nor does it assist research in any way. And what are the motivations for asserting this Omniscient Designer? So far as I can see, it is purely religious. So, to sum up, we have a Designer we cannot know anything about using a method we do not understand at a time, place and for a purpose we cannot ever find out, because, and only because, it suits some people's anthropomorphism about the universe. Is it creationism? Yes it is.

Let me say, as a nonbeliever, that I find the creationist and ID versions of God as terribly small gods. These are gods who must behave according to some standards that are asserted by the individual interpretations of a Bronze Age theological text. These gods must use magic to do things, but we have to be able to find evidence they acted. Why? Because of those individual interpretations of a Bronze

Age theological text. They constrain any reasonable conception of God to a very small strait jacket. How much better to adopt Aquinas' view of God as the foundation for *all* being, and to assert that faith completes rather than supplants reason (science) as the ID creationists would like.

Conclusions

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1. The idea that the world must be caused by Mind is based on the idea that we are little worlds, and the world is a big version of us, in short, of anthropomorphism.
2. Natural theology aimed to show the nature of God from the nature of his works. But it was inverted by ID, which aims to show that God exists from arbitrary claims about living things and analogy to designed objects like watches.
3. This analogy breaks down in every respect. The Designer cannot work like us, and his designs cannot be like our designs. This is Hume's argument in the Dialogues.
4. Ordinary human design is trial and error, like natural selection.
5. Rarified ID Design must be done by something so close to a God that there is no real difference. Hence, claims of not being religious are at best misleading.
6. The arguments for a Designer based on Design Goals falter as you look at the unique "ends" of each species. The logical terminus is that each species has a different design goal, and so there are as many Designers as there are designs. Hence it is indistinguishable from an account of evolution by natural selection.
7. If ID were adopted in science, it would cause an immediate end to all research in which a claim could be made for any kind of design at all, as we cannot know the nature of the Designer, or its method, ends, time or place. Science, and in particular biology, would effectively stop.
8. ID is the new creation science.

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John S. Wilkins

web: www.wilkins.id.au blog: evolvethought.blogspot.com

God cheats

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The Evolution of Feathers

Post of the Month Runner-Up: October 2004
by [parrotlady](#)

Subject: Re: Garrison Keillor on Republicans
Date: 1 November 2004
Message-ID: 200411010417.iA14H0pS018550@ms-smtp-04.rdc-kc.rr.com

In article glennsheldon-390a5776.0410302146.6cc46cfa@posting.google.com, Glenn wrote:

> That was not my position. My "position" was wondering why feathers
> were selected for in a warm climate starting supposedly millions of
> years before Archy, lasting millions of years after.

Feathers have a big evolutionary advantage quite outside their insulative properties. In addition, the assumption that feathers are too warm is incorrect.

There are four types of feathers on a bird. The two main outer types (the contour feathers and the flight feathers) each consist of hundreds of interlocking barbules attached to lightweight, hollow supports. The barbules are "zipped" together into a cohesive whole, like a latticework or a crocheted afghan. These feathers are used for flight and for protection from the weather.

There is also an underlayer of fluffy feathers, called the down feathers, that have no barbules and which look a lot like cottonwood seeds. They are used for insulation. (If you are wondering what the fourth kind of feather is, it is a stiff feather that is mostly shaft with little vane, used for either social/sexual display or for sensory feedback much like whiskers are used.)

None of these feathers completely cover a bird's skin; they are arranged in patterns, with ample areas of bare skin in between (these areas are easy to see if you ruffle a bird's feathers backward.) When the bird is too warm, the outer feathers are pressed flat so that they lie closely against the body. This flattens the fluffy down feathers underneath and prevents them from retaining heat. The areas of bare skin give off excess heat which passes easily through the airspaces in the latticework of the outer feathers. In cold weather, the bird raises its outer feathers away from the body, and fluffs the down layer, causing it to expand, cover the bare skin areas, and trap warm air against the body. Thermal regulation is not a problem for birds.

If this were all that feathers could do it still might not explain why some other heat and/or flight mechanisms didn't evolve instead. But the advantages of feathered flight far outweigh alternate flying mechanisms, such as flaps of skin, because:

1. Feathers are far lighter than skin; they have almost no density. The entire feather is just an airy matrix of overlapping barbules. They weight almost nothing and provide a disproportionate amount of loft. This is why birds can fly almost straight up from the ground whereas, for example, flying squirrels cannot.
2. Feathers allow for flight steering in ways that skin flaps cannot. The primary feathers can be turned *individually* to serve as airfoils and provide extremely fine gradations of control in the air.
3. Feathers resist damage in ways that membraneous wings cannot, and can be easily and often immediately repaired. Because of their flexible structure, the barbules can just "unzip" rather than breaking, so that the structural matrix provides no resistance against a force. The feather will either bend aside from an obstruction or else separate so that the object can pass right through it. The bird can easily zip the feather back together again later, and indeed, most flying birds spend an inordinate amount of their time preening. Every feather must be attended to individually and I have heard that each one gets "reziped" at least once a day. Social preening is one of the main interactive activities of many types of birds. Being able to zip yourself back together after a mishap has a big survival advantage.

4. Feathers can be replaced regularly with little adverse affect. A complete set of new feathers comes in once or twice annually, being replaced gradually in a staggered pattern that allows the bird to retain flight at all times while completely swapping out all its flight equipment. On those occasions where a feather is broken off outside of moulting season, it doesn't wait for the next moult but is regrown immediately. The system is rapidly self-repairing.

Fine-tuned flight is the primary evolutionary advantage that trumps all the others. The precise control provided by feathered flight can't be matched by any other structured apparatus we know of, and the evolutionary advantages it provides would probably outweigh any heat regulation problems, even if they existed, which they don't.

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There are 247 real people in the world and the rest are ducks.

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The Source of the Flood Waters

Post of the Month Honorable Mention: October 2004
by [Thonmas H. Faller](#)

Subject: Re: A different hypothesys on Noah's flood water sources.
Date: 6 October 2004
Message-ID: 416454AE.755B3BC0@sgi.com

Jonin wrote:

> Hi to everybody, most of you (especially the open-minded ones) have
> helped me much on one of my thread "Water sources of Noah's flood".
>
> Following the your claims raised on my subject, I've found two
> interesting links that propose a different hypothesys than the "water
> / vapor canopy" that you guys "destroyed" on my old thread.
>
> Please give me an opinion about.
>
> <http://www.kjvbible.org/geysers.html>

Well... you asked. Here's a section from the first reference, trying to get water from a stone:

>According to what is written in the Scriptures, the fountains of Noah's flood
>may have been a form of geyser activity on a massive, world-wide scale,
>concentrated along the mid-oceanic ridge system.

Geysers are produced when porous sedimentary rock already carrying water is located over a near-surface heat source. There has to be a way for the water to get out (faults), and a way for the sedimentary layer to recharge, or it would run out of water.

The rock at the mid-ocean ridges is fresh basalt. It's igneous rock, and is not a reservoir of water. The site proposes a vast underground resource of water to feed these geysers.

Trouble is, geysers are like slowly dripping water onto a small hot plate. What the site is proposing is heating a quantity of water larger than the oceans to steam, letting it escape at the ridges, and then using it for rain. The mental picture is like a teakettle.

The problem again, as with the vapor canopy model is that the people proposing it have no handle on the size of the physical forces they're dealing with.

The reality is that any reservoir of rock big enough and hot enough to do the job has enough heat to boil everything on earth to death. Steam has a heat value all its own. It takes energy to change water at 212 degrees to steam at 212 degrees, and that heat is released when the steam cools back to water. So it takes a much smaller amount of steam to boil all of the earth's oceans than it takes to re-condense into a flood big enough to cover all the mountains.

Everyone dies with this model. There is no way around it. Despite all the pretty pictures and their "just-so" models of explaining the ocean basins, they can't get enough water for a flood without killing everyone. Same problem as the "water canopy" model. It's very simple physics, and you can perform the arithmetic on a calculator.

> http://www.kjvbible.org/windows_of_heaven.html

This one is complete handwaving, with some science terms thrown in. Here's one of the glaring errors, that demonstrates these guys are not scientists, they're laymen, and they are basing their theories on completely erroneous data:

>Because it is the second lightest gas, the He atom floats skyward to
>settle in the upper reaches of the atmosphere. Although it is light,
>it is still too heavy to escape the pull of earth's gravity.

This is false. Their other statements about the amount of helium gas are false. To get the amount of helium they'd need, you'd bake and sterilize the world with radioactivity from radioactive decay. Helium rises to the top of the atmosphere and dissipates into space readily, because, like hydrogen, the mean velocity of any He atom is higher than the escape velocity, so if there isn't any atmosphere above it to bounce it back, off it goes. It wouldn't form a stable layer unless you had huge gobs of it, like the Earth had immediately after its formation, before the Sun turned on. Once the Sun started shining, the Earth lost about 99% of its mass, and instead of looking like a little Jupiter, it looked like a small cloudy dirt ball. But that He was part of the original cloud that formed the solar system, and not from the Earth's interior.

The parts about helium acting as an insulating layer are also handwaving. What you'd get would be titanic lightning/plasma strikes where the magnetic field constricted enough to overcome the insulation effects. The northern and southern polar areas would be sheets of glass...

Their fountain effect is ridiculous. The effect of atmospheric oxygen reacting with ionospheric hydrogen, especially considering the breach in the insulating layer, would be the Hindenberg on a global scale. You're talking about sucking up enough oxygen from the atmosphere to combine with water to make a Flood. You instantly change the O₂ content of the surface atmosphere from about 20%

O₂ to something like 1% O₂. Everyone dies again. The oxygen is sucked out of dissolved gasses in the ocean, so all the fish die too. The water falling from the sky is full of ozone and helium instead of oxygen. Everything dies again.

The rest of the article is the same stuff. Evaporation moves heat around. To evaporate an ocean, you'd bake the rest of the earth and atmosphere. There is no escape. There is no way to get enough energy to move the components of the Flood around, not by any means. This goes right past the guys on these sites, despite all of their scientific phrases, despite all of their isotopes and properties of elements, because they won't do the very basic science that shows they're wrong - and wrong by magnitudes of error, not just by a little bit.

That's the difference between science and Flood Science, between geology and Christian Geology. Flood Science is committed to the result, no matter what rules you have to bend. It ignores the very simple facts, arithmetic-level facts, that prove it wrong, and concentrates on making pretty pictures.

Tom Faller

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Antibody Binding and Goal Sequences

Post of the Month Honorable Mention: October 2004

by [MEC](#)

Subject: Summary Pitman and the immune system
Date: 20 October 2004
Message-ID: c240c53.0410201545.71ffab27@posting.google.com

I'm blastedly busy and rapidly losing interest, so I thought I'd throw out some closing thoughts on my discussion with Dr. Pitman in the Evolution and the Immune System thread.

Dr. Pitman claims that generation of B-cell receptor (BCR) diversity using a process of random mutation and selection, which he stipulates accurately models certain evolutionary models, is actually just like Dawkins's little Weasel program which shows how powerful the process of random mutation and selection can be. Unfortunately for Dr. Pitman, neither Dr. Dawkins *nor any other scientist on this board or elsewhere* claims(ed) that Dawkins's program was an accurate model of evolutionary change. As Dawkins clearly pointed out, the exercise was merely intended to show how powerful selection can be.

Anyways, back to the immune system. Dr. Pitman's confused ideas on this rely on his mischaracterization of the affinity maturation of BCRs as being "template" based. He has waffled, as he is wont to do, on what he actually meant, but let's review what he said initially, irrespective of how he wants himself currently to be understood;

"It (BCR affinity maturation) is all very much like Dawkins's 'Methinks it is like a weasel' evolution scenario. Start off with a random character sequence like 'pio aweri tiher ypoirm' and see how long it takes to evolve the specific phrase, 'Methinks it is like a weasel'. Well, since we already have the goal sequence in place, then all that has to be done is to compare what we currently have with the goal

sequence. Each mutation that matches the goal sequence will be kept and those that do not will be discarded. Dawkins's algorithm proves that such evolution will not only happen easily, but very rapidly."

Note the phrase "goal sequence". So Dawkins wrote some script which showed that you could, through random changes and selection, rapidly achieve the goal sequence of "Methinks it is like a weasel". Dawkins was right; it IS easy. Also note that Pitman intimates that he thinks Dawkins was implying that he (Dawkins) thought evolution acted in the way his script did. He didn't and it doesn't.

Back the discussion at hand. Pitman (incorrectly) says that the immune system searches for an "optimal sequence" for affinity binding of an antibody to its conjugate epitope. I have repeatedly corrected him on this, as the immune system only generates antibody fits that work. They need not be optimal, especially since multiple antibody affinities are typically generated. It doesn't take a Nobel Laureate (much less an MD) to understand that multiple sub-optimal fits can be sufficient to clear an antigen. It doesn't require a dagger in your heart to kill you (an optimal "dagger-induced" death, if you will). Lots of small cuts will do the trick just as easily. Nevertheless he still insists that "the "fit that works" is by definition the "optimal" or "best" fit." Odd, ain't it? This kind of rhetorical obfuscation is a strategy so often used by Dr. Pitman. I suppose it works well for him on the uncomprehending bobble heads at the congregation pot-luck. Doesn't fly here on T.O. very often, though.

Anyway, onto the weasel hunt. Pitman claims that the immune system searches for a BCR reactivity from a pool of less capable BCRs much like the weasel program does. In that case an unintelligible sequence of 28 English language characters is randomly mutated to *ultimately* generate a meaningful phrase, the "optimal sequence" of 28 characters, "Methinks it is like a weasel". Most of the steps along the way give meaningless phrases - at least when read literally. Sean's idea is that evolution is incapable of spanning these meaningless "neutral gaps" and is this which lies at the crux of Pitman's ID theology.

Let's assume the antigen in question has the sequence; "METHINKS IT IS LIKE A WEASEL" and that your immune system is attempting to eliminate this nasty antigen. Now an antibody binds to an antigen in ways roughly analogous to a lock and key. A portion of the antibody, called the antigen-combining domain, contacts the antigen directly (usually, I'm ignoring salt bridges). Since I have no idea how you could approximate this analogy using letters, let me use lower case letters for the antigen-combining domain of the antibody. When a good "fit" to the antigen is made, the antibody has the lower case letter (or a space) in its corresponding sequence. So a good fit - the best or most optimal fit, in fact - for "SEAN PITMAN" would be "sean pitman." Got it?

Let's follow the fate of *one* made-up immature (that is, naive; having never encountered an antigen before) B cell clone reacting to "METHINKS IT IS LIKE A WEASEL". The antigen-combining domain of the BCR of this B cell has the following sequence:

afteirturhoeirtoeirtoiwrotei

Thus, this BCR has four contact points and since this allows for a certain degree of binding to the antigen it is favored, in a relative way, over other BCRs in the immediate pool. This B cell then proliferates, but upon proliferation errors occur in the coding region of the antigen-combining domain (this is called somatic hypermutation) resulting in randomly altered BCRs in the next generation. Amongst those in this second-generation pool, we find some with the following BCR:

aftehnrhœirtoiketoiwrusel

Goodness! Now there are twelve contact points. Much more likely that this BCR has better affinity than its predecessor, don't you think? Same thing happens to these clones; they proliferate but suffer a high degree of error in replication of their BCR antigen-combining regions and we find, in the next generation a bunch of BCRs with the following sequence:

metehnks iteirtliketo weasel

WOW. 20 contact points. Now this BCR is REALLY binding well to the antigen (I can say this because I'm making this up). Curiously enough, though, we find that in this generation of BCRs there are also the following sequences:

methibssxit ir miketa wtasel

and

aethinssxit ts mbketa wtasef

Golly, also 20 contact points! Since this is a made-up story, I can make up the immunology AND the punch line. Made-up immunology; this repertoire of BCRs is sufficient to clear the "METHINKS IT IS LIKE A WEASEL" antigen.

Punchline; anyone think any of these BCR sequences make intelligible English sentences?

THAT is where Pitman's argument falls off the rails; the immune system is NOT aiming for any particular sequence (the antigen is NOT acting like a template); there is NO goal sequence. There are many changes which suffice for the function, which is of course antigen binding. It gets a whole lot worse for Pitman's argument once it is understood that within any given epitope sequence certain residues are more favored than others. Usually only some of the epitope's amino acids take part in the binding to an antibody's antigen combining domain; others within the epitope are superfluous. Often different combination of amino acid residues within a single epitope will result in equivalent affinities with different BCRs. That is there are often neutral changes that result in variation of BCR sequence but the function - in this case affinity - is not altered, but the utility to the organism is enhanced. Pitman has been challenged with this elsewhere when people have pointed out to him time and time again that there are relatively few amino acid positions which are critical for an enzyme's function. Much of the rest of an enzyme plays no role in its function. The English language is NOT a good model for generating diversity in protein sequence.

Unless you think "methibssxit ir miketa wtasel" makes sense.

One final comment. In response to my comment; "You make a big deal of neutral gaps. I will not go into it with you."*

Sean responds; "Don't want to make a fool out of yourself like your buddies already have?"

I have only one question. For Dr. Pitman; did it really take Zachariel "zillions" of runs of his program to generate "O Sean Pitman"? Really, did it?

M

*A sentiment I will religiously attend to, partly because unlike Dr. Pitman I am reluctant to pontificate on subjects I am not so well versed on, and partly because Dr. Pitman's penchant for a form of rhetorical revisionism that would make George Aiken blush makes me wholly uninterested in jumping in. Kudos to those that do, you are made of sterner stuff than I.

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