

The not-so-intelligent professor

The Not-So-Intelligent Designer: Why evolution explains the human body and intelligent design does not

Abby Hafer

Cascade Books, an imprint of Wipf and Stock Publishers, Eugene, OR, 2016

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Abigail (‘Abby’) Hafer has a doctorate in zoology from Oxford University and teaches human anatomy and physiology in the nursing programme at Curry College, a small private college of 2,100 students. Her goal for this book was to document what she argues are the many examples of poor design in the human body. From this evidence, she concludes that the body was not designed, but rather it evolved.

All of her examples have been carefully refuted in both the secular and creationist literature. Having taught anatomy for 30 years, I have reviewed many anatomy textbooks in preparation for my classes and am not aware of a single one that makes the claims she does. Rather, they consistently show most of her claims to be erroneous.

She also shows little evidence of reading the Intelligent Design (ID) or creationist literature, as indicated by her false claim that those “who are likely to be persuaded by ID arguments don’t read scientific journals, or lengthy books about evolution, *and they never will* [emphasis in original]” (p. 1). The irony here is unmissable.

She speaks widely to colleges, universities, and sadly even churches

(although she’s a rabid atheist, listed as an American Humanist Association speaker). Her focus is consistently on mocking creationists and ID supporters, as is obvious from the titles of her talks, such as “Who does the Creator like better—us, or squid?” and “Why do men’s testicles hang outside the body, but elephants have their testes inside the body?” As usual, these are really pseudo-theological arguments rather than scientific ones. She spends much time on the mudskipper, which she claims ID advocates say could not exist. Her major poor design claims are reviewed below.

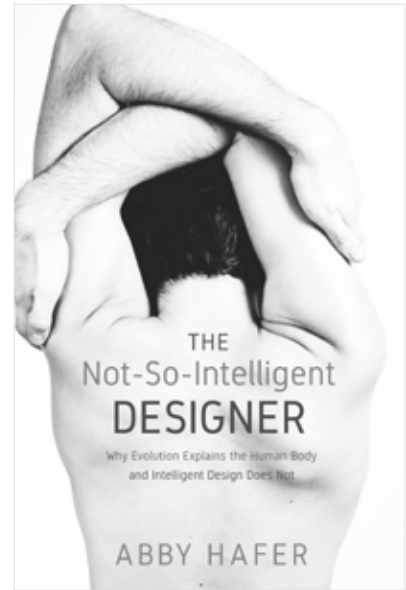
Human testicles

Her claim for human testicles is that

“... if testicles were designed, ... why God didn’t protect them better. Couldn’t the Designer have put them inside the body, or encased them in bone, or at least put some bubble wrap around them? Is this the best that the Designer can do?” (p. 5).

Concluding that a structure is poorly designed instead of asking why the existing design exists is a science stopper. The ‘why’ question motivates research into the reasons for the design. When this approach was applied to the human appendix, the tonsils, the backward retina and other examples, good design reasons for the existing design were found in all cases.

She explained that when she was looking for new approaches to refute ID she knew she “had a winner when inspiration hit me in the middle of an Anatomy and Physiology lecture The male testicle is a great first argument against ID” (p. 2). She then stated that when she got what she needed for a “political-style



argument”, she did “what any sensible woman would do”, email her minister (p. 2). As chance had it, her (Unitarian Universalist) ‘church’s’ Darwin Day celebration was that Sunday, and her minister used the testicles example to introduce his sermon in honour of Darwin (p. 2). Her main argument is that male testicles are outside of the body, thus are prone to injury, noting that for many animals, including reptiles, the testicles are inside of the body.

If the author were to apply just a modicum of logic, though, she (and her cohort) would realise that male testicles are outside of the body for several important reasons, such as to regulate scrotal temperature for optimal spermatogenesis development.¹ When testicle temperature drops, a complex system causes the cremaster muscle to contract, which moves them closer to the warm body. When their temperature rises, the cremaster muscle relaxes, allowing them to move away from the body, insuring that their temperature is kept within a very narrow tolerance. Their temperature is also regulated by increasing or decreasing the surface area of the tissue surrounding the

testicles, allowing faster or slower dissipation of their heat.²

A major reason for their close temperature regulation is because humans are fertile year round, and most animals with internal testicles are not. Most animals need to be fertile only for short times, often when outdoor temperature allows maintenance of their proper temperature.

She also ignores the fact that testicles are a secondary sexual trait, similar to female breasts, which are also prone to injury. A parallel argument is the claim that, for this reason, the female breast is poorly designed. Therefore, because its size does not affect either milk production or breast feeding ability, it would be advantageous not to protrude from the body. However, because the baby's face is quite flat, it's advantageous that the breast protrude somewhat so the baby can get good suction. Baby mammals with snouts can suckle on flat breasts with teats. That the breast is a major female secondary sexual trait is documented by the fact that mastectomy is a very traumatic operation for most women, and reconstructive surgery is often used to normalize the breasts' appearance.

The backward retina

Seemingly oblivious to the large amount of literature documenting the critical reasons for its design, she claims the backward retina is a major example of poor design. It is said to be backward because the rods and cones do not face towards the eye's light source, but away from it. One reason for its existing design is that the photo cells must make contact with the retina pigment epithelium (RPE), which must be located at the back of the eye in order to meet the large oxygen and nutrient demanded by the photoreceptors to function properly. Rods and cones require an

enormous amount of energy for their very high metabolism and to recycle photoreceptor retinal cells.³ Due to phototoxicity damage from light, rod and cone cells completely replace themselves about every seven days. The RPE is a well-designed complex structure that enables it to serve this function.⁴ The Müller cells (radial glial cells), anterior to the retina, have both the shape and optical properties that contribute to optimizing incoming light transferal to the rods and cones by reducing light scatter,^{5,6} as well as optimizing night vision without impairing day vision.⁷ Their sensitivity is indicated by their ability to respond to a single photon.

The female birth canal

The difficulty commonly experienced in childbirth is not due to the poor design of the female birth canal as Hafer claims. The problem is that the birth canal is framed by the pelvic bones, which are only slightly larger than the typical baby's head. Actually, it is good design: the front of the pelvis is joined by cartilage between the two pubic bones, and this softens during pregnancy. Thus the opening can increase during labour, allowing most women to have a normal delivery. Problems that sometimes occur would not be unexpected in view of the Genesis Fall. The pelvis is surrounded by soft tissue, which cradles the baby like a well-feathered nest as it exits. These soft tissues also help with the rotation of the baby's head as it descends through the pubic outlet during birth.⁸

The human pharynx

Hafer also claims that the human pharynx is poorly designed because it is prone to allowing food going into the wind tube, causing choking—a flaw she claims can only be attributed to macroevolution. The fact, however,

is that the existing pharynx design allows both simultaneous eating and breathing with greater efficiency and less body bulk than if humans had two completely separate unconnected passages. The two systems are actually effectively separated, even though they have a common opening. They also function exceptionally well due to subconscious reflexes that allow them to operate without concern for most of our life. The two-system design would require two body openings and a far more complex tube and networking system, resulting in a greater likelihood for errors and problems.

A life-threatening choking event is very rare compared to the number of lifetime swallowing events, which occur about 1,000 times a day or 27,375,000 times in an average lifespan.⁹ Choking occurs mostly in children under 6 years old, eating too fast, and talking or laughing while eating.

The blood clotting mechanism

The blood condition she puts down to poor design, hemophilia, can instead be shown to be due to mutations, often of the factor VIII protein, a necessary part of the clotting system, which she elsewhere claims is not irreducibly complex. She also assumes that modern humans have evolved from a less fit animal ancestor, ignoring the fact that humans have accumulated thousands of mutations in the 6,000 years since the originally created human pair, currently estimated to be as many as 100 new mutations for each new generation. This rate is higher than the rate of somatic mutations noted below due to the many mutations that result from chromosomal abnormalities, such as non-disjunction and crossing over, and damage in the womb from teratogens and other sources. Once the egg is fertilized, genetic damage is less likely to be repaired for several reasons than in most somatic cells.

Scurvy

Contrary to her claim, scurvy is also not due to poor design, but to a lack of vitamin C (ascorbic acid) in the diet, which is not a problem for the many animals that can manufacture this vitamin, including most mammals except humans and most simians. The only simians that can produce vitamin C are lemurs and prosimians. She inadvertently notes that the problem is actually not due to poor design, but to a mutation in the genes coding for gulonolactone oxidase (GULO for short) in the final phase of vitamin C biosynthesis.¹⁰ One theory is that most simians have historically consumed enough food containing vitamin C, and when this mutation occurred, it did not interfere with their survival and was passed on without problems to their offspring. The location of the mutation is also likely a hot spot, thus is found on, or near, the same gene location in most simians.

The teeth

Hafer argues that animals which develop numerous sets of teeth have an advantage over humans, who develop only two sets, the baby and adult teeth. She argues that if humans had many sets of adult teeth they could shed the bad ones and constantly renew their teeth. She ignores the research that found diet and genetic factors, as well as poor dental hygiene practices, are strongly implicated in the problems that some humans have with tooth decay. Only a few types of bacteria cause tooth decay, and the oral cavity bacteria composition varies, as does the saliva composition; thus, some people have many cavities, others few or none, even if their diets and environments are similar. In short, tooth problems are not due to poor design but can be demonstrated to correlate to ignoring essential hygiene in the majority of cases. With proper care, adult teeth almost always last a lifetime.¹¹

The genome

The author argues that the human genome is poorly designed based on the existence of mutations, which she claims is due to “our genome’s tendency to get its copying wrong” (p. 175). In fact, DNA replication is extremely accurate, partly due to the dozen or more proof-reading systems and the editing ability of numerous enzyme systems. As a result, it is estimated that, due to the DNA repair system, only 1 in every ten billion bases is incorrect when DNA is copied after the repairs are made.^{12,13}

The appendix and other claims

As an anatomy professor, she should know that this important organ is not poorly designed or vestigial as she claims (pp. 177–181) but serves at least five important functions. One newly discovered example is that it is used as a safe house for probiotic bacteria, which allows GI tract probiotic bacteria to be replaced within a few hours after the use of antibiotics or after diarrhoea flushes them out of the system. She disputes this conclusion based on the incorrect claim that antibiotics also usually kill the bacteria in the appendix. She also claims that most people who take antibiotics do not have problems, which may be true due to the function of the appendix or the advice of the person’s doctor to consume foods, such as yoghurt, to replace the lost bacteria. Rather than just assert this claim here, she should publish her conclusions in peer-reviewed literature (that’s what they usually tell creationists¹⁴)! Also, she seems to be unaware of one problem: antibiotics can sometimes kill probiotic bacteria that normally keep the dangerous *Clostridium difficile* bacterium at bay. Patients without appendices are four times more likely to contract this infection.¹⁵

Hafer also claims the coccyx bone is a remnant of our tail left over from

our evolutionary ancestors (p. 179). However, it is an important muscle, tendon, and ligament attachment point, demonstrated by the necessity for surgeons to consider these attachments when operating on the coccyx. Last, she incorrectly claims that the arrector pili muscle is vestigial (p. 180). In fact, it has several important functions, including heat production and lubrication of the skin.¹⁶

Irreducible complexity

Hafer has a section on irreducible complexity, concluding that, in essence, nothing is irreducibly complex. The reader might be forgiven for wondering here if she even has a basic understanding of what irreducible complexity actually is—namely, if any system requires all of its parts to function, it is, by definition, irreducibly complex.¹⁷

Conclusions

The main focus of the book is to discredit ID. Hafer quotes the ID wedge document that says “Design theory promises to reduce the stifling dominance of the materialist worldview, and to replace it with a science consonant with Christian and theistic convictions” (p. 8). She then claims that materialism means “scientific facts”, and that ID supporters “want to squash science as a method of investigation, which obtains facts about the material world by investigating it using material means” (p. 8). Of course, this claim is a gross distortion. By ‘materialist’, ID supporters mean the dominance of materialism to the extent that suppression of non-materialist ideas now dominates science.

Hafer irresponsibly concludes that “ID is very well funded, well organized, very determined, and they want to indoctrinate American children and American society with their antiscientific rubbish, at taxpayer



Figure 1. Wisdom teeth are often considered poor design or even vestigial. The problem, though, is mainly due to overcrowding, as shown in this picture, and typically due to our soft Western diet. In addition, genomic degeneration has also played a role in producing less than perfect teeth and other structures as well.

expense” (p. 8). She then concludes, “the only thing ID proponents have in common besides, in many cases, fat paychecks from the Discovery Institute, is that they insist that their version of reality must be taught in public schools at taxpayer expense” (p. 10). If she was conversant with ID literature, she would know that they not only do not “insist that their version of reality must be taught in public schools” but openly oppose forcing teaching ID in government schools. This falsifies Hafer’s claim that what ID supporters

“... are really trying to do is teach their particular religion in American public schools at taxpayer expense. They pretend that it’s science, but by their own admission, their stated goal is to destroy science. They wish to insert their religion into public schools, so that all children are indoctrinated with their religion. All paid for by American taxpayers” (p. 10) [Apparently coercing tax dollars to support atheistic evolution is OK].

She asserts that “ID proponents want everyone in the US, by way of public schools, to be taught that the actual facts about the material world don’t exist, or shouldn’t. Instead, they simply want to tell you what you have to believe, regardless of any factual basis. In other words, if they invent it, you have to believe it” (p. 7).

She concluded that when ID supporters attack evolution, it “... is simply their way of getting into the American school system. They try to convince politicians that what they are saying is science, not religion, so that then they can force their way into American public education, and then expand from there. They see this as a political fight, and are using political means to fight it” (p. 7).

These quotes illustrate the rabidly irresponsible name-calling that dominates her book. I have read over 100 anti-ID and antirecreation books, and this book is, without question, the worst and the most irresponsible. Most of her sources are from antirecreation and anti-ID literature, where she uncritically repeats numerous carefully refuted claims. I read this book to better understand the opposition to ID, but when over 70% of it is irresponsible invective (I am forced to stress that) to refute a movement, you would think the author would have carefully read the material which that movement produces and respond to it in an informed way. This she has not done.

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