Reviewer’s report

Title: Ultimate Answers in Medical and Health Profession Courses

Version: 1 Date: 27 October 2004

Reviewer: Randolph Nesse

Reviewer’s report:

General

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. This article advocates asking and trying to answer ultimate and well as proximate questions that arise in the course of medical education. It begins with a classic example, the difficulty of human childbirth. Beginning the first sentence on page 3 with a reference to women students distracts from the very general application of evolutionary ideas and the importance of understanding childbirth for physicians of both sexes. The explanation offered is complete and interesting, but a bit drawn out. This example is not exactly background, however. Instead, the authors could briefly summarize the origins and recent progress of Darwinian medicine as an introduction quickly followed by their good examples.

2. I note that this is a “debate” paper, but a phrase such as “The story goes like this” will fulfill all the worst expectations of some readers. A major problem in this area is whether it is possible to accurately distinguish true from false stories. The important genuine debate about how to do this often is lost in invective and extreme statements that suggest it is impossible. The authors should do something to head this off if they wish to convince skeptical doctors.

3. The Discussion starts on page 4, but I fear this may be an attempt to match a prescribed format albeit awkwardly. The two kinds of explanation are not labeled separately enough in the preceding paragraphs to justify the first sentence of the Discussion. Perhaps the separate kind of explanation could be separated more, then their status as exemplars of proximate and evolutionary could be explained more simply. The authors should be aware that the whole idea of an evolutionary explanation will be foreign to many readers. More explanation is needed and the legitimacy and testability of such explanations must be demonstrated.

4. Sickle cell disease is another classic, but of a special kind, because it is the only confirmed example of heterozygote advantage, and it results from a point mutation of recent origin. Most students learn about this already. Because it is a gene frequent only in certain groups, it distracts from the larger picture of genes that we all share that predispose us to disease. Nonetheless, the question of why sickle cell genes persist is a good one. The other question of why heterozygote advantage exists is not covered. Such diseases are problems only because we happen to be dizygotic. A small point: are stem cell transplantations really used? It might be better instead of going on about sickle cell disease to discuss some other hemoglobinopathies at more length, and to make the point that many other genetic mechanisms can also explain the persistence of harmful genes.

5. On page 7 the discussion turns to “symptoms” which seem to be here protective responses, while
“symptoms” in medicine are usually defined as subjective reports as contrasted with objective findings. The point is well taken, however, that students learn too little about the utility of these responses.

6. On page 8 we come to Darwinian medicine which has provided several of the examples previously discussed although readers might not recognize that. Also, the bullet points that follow on pages 9 and 10 are taken relatively straight from Williams and Nesse, but it would be hard for readers to see the similarities and the differences from the approach in this article. Design compromises are followed by path dependence, then “genotypic traits” (what is a genotypic trait?) and then what others have called mismatch or novelty. The explanation of genetic differences among populations is not a core theme of Darwinian medicine, but is usually subsumed as an example of groups subject to different selection pressures, while if all humans were subject to these forces, we all would share these problems.

7. The last bullet is described as maximizing reproduction at the expense of health and longevity, but the example don’t follow. Huntingtons is simply lack of selection. Senescence is more of a trade off, isn’t it? There are other better examples of reproduction at the expense of health, such as costs of mating competition.

8. Antibiotic resistance is a fine example, but readers already know about it so they need to be told what explicitly evolutionary thinking will add.

9. Overall, the thrust of this article is very useful. Readers will come away with a better notion of why Darwinian medicine is interesting and potentially useful. But it it not very useful yet and there are difficult matters of how to test hypotheses that should be admitted lest offering an opening for critical readers to undermine what it otherwise a most useful contribution.

10. Throughout, the article uses “ultimate” and “evolutionary” explanations as synonyms, although many writers have advocated avoiding the word “ultimate” because of its religious and philosophical overtones. It makes some critics see red. Using “immediate” as a synonym for “proximate” is less problematic but still confusing. Unless there are good reasons, “evolutionary” is preferred to “ultimate” to describe these explanations.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: No

Declaration of competing interests:
There are no financial complications, but this article does pretty exactly follow the lines of my book with Williams without letting readers know that. I have tried to be fair in the review and to suggest ways to improve the presentation, but bias in such situations is always possible. These comments should not, of course, be disclosed to the authors.