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# Questioning the Role of Darwinian Medicine

Presented at the joint symposium of  
The Society for the Study of Human Biology and the Human  
Biological Association

*The Changing face of Disease: Implications for Society*  
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## Abstract

Darwinian medicine as a distinct scientific discipline can be traced to George Williams' and Randolph Nesse's paper 'The Dawn of Darwinian Medicine' (Q Rev. Biol. 66: 1-22, 1991). Ten years on, at what is still the dawn of a new millennium, it is timely to review the current state of Darwinian medicine and to assess some of its still latent potentialities.

Nesse remains the main protagonist of a Darwinian approach to medicine. Important work by others has appeared but his and Williams' 'Evolution and Healing' (Weidenfeld and Nicolson, 1995)<sup>†</sup>, although written for the popular press, remains the primary text of the whole discipline. Distinct lines of academic interest and inquiry are, however, emerging within Darwinian medicine and it has found inclusion in a number of undergraduate curricula. Sufficient interest exists to suggest that it will survive as a discipline. But as a discipline, Darwinian medicine needs more than a single protagonist – it needs serious critical attention. It is important, therefore, to ask in what form the discipline is to persist and into what new areas it might go.

Fundamental to such questions is the relationship between Darwinian medicine (as a scientific discipline) and Western clinical medicine (as a profession). It is suggested that, rather than try to gain direct acceptance by the medical profession, Darwinian medicine might seek to establish itself more firmly within the academic disciplines of evolutionary and human biology. It is suggested that it give special attention to identifying and making its own distinctive voice heard as a biological science of health and disease distinct from medicine – a voice that clinical medicine, drawing as ever from allied sciences, cannot then afford to ignore. To this end, the question of what might be the "zeroth law" of Darwinian medicine is posited.

<sup>†</sup> 'Why We Get Sick: The New Science of Darwinian Medicine' New York: Time Books 1995.

Darwinian medicine as a named discipline is now ten years old. It may be said to have begun with the publication of Williams' and Nesse's review entitled 'The Dawn of Darwinian Medicine' in 1991. Although these workers named the discipline, they were doing so only in response to a trend that had been emerging for some time previously. Their review was an attempt to portray familiar medical conditions in an explicitly evolutionary context. The non-academic world has known of the existence of Darwinian medicine since 1995 when the same authors followed their academic review with the book 'Evolution and Healing', aimed at the popular science market. This advertised Darwinian medicine more broadly and received wide attention in the press.

Although in Darwinian medicine evolutionary theory is being applied to the study of health and disease, it is important to recognise that that study concerns its more medical aspects. Fabrega has described Darwinian medicine as '[the pursuit of] how evolutionary theory can sharpen the efficacy of medical practice'. It is of note that a number of (non-medical) university programs, mainly in the US, now include Darwinian medicine within their syllabi. A significant proportion of those that publish comprehensive course details on the internet give the clear impression, however, that what previously appeared on human biology syllabi continues to appear but in a different context. This is not to denigrate those programs as simple re-packagings of extant material, but serves rather to highlight new uses to which the material and thinking traditionally adopted by human biologists may now be put.

Despite having received a fair amount of attention in the press, Darwinian medicine appears to have avoided overt criticism. That it

has avoided any charge of being “mere evolutionism”, for example, suggests it demonstrates a certain legitimacy and acceptability. But it is interesting to note the general lack of criticism that there has been. A critical reading of the available literature from the last decade suggests that the fundamental statements characterising Darwinian medicine continue largely unchallenged. It would appear that those capable of interrogating the basic ideas and philosophy behind the discipline have yet to be heard. It is, therefore, necessary and timely to begin to ask such questions of Darwinian medicine as befits the marking of its first decade.

The infectious disease model is one that infiltrates and colours a wide range of thinking about health and disease generally. Once introduced into the medical and general psyches, it has tended to become *the* model of *all* disease. Although infectious disease is still important in Western industrialized nations today and may become more so with the rise in antibiotic resistance, chronic degenerative conditions are now a major health problem. It is the non-infectious conditions that Darwinian medicine is particularly well suited to address. Important to Darwinian medicine is the marked disparity between the environment in which the human species now lives and that in which it evolved. The type of issues addressed here might be described as problems concerning the design and safe operation of the human machine. Hopefully this line of research will prove fruitful for valuable insights are likely to be useful not only to medicine but to other scientists studying human function.

This latter point draws attention to there being two separate groups of people that can benefit from work in Darwinian medicine: those within the medical profession and those in the wider scientific community.

Having been given the title 'Darwinian medicine', it remains to be seen how fully assimilated into medicine's mainstream it will become. A review of the history of medicine shows how it has often been slow to adopt new techniques and ideas. Medicine has frequently adopted the conservative stance that if a treatment yields results, then it has little need to consider others.

This raises the question of how workers in Darwinian medicine should go about their research. Should these workers deliberately try to improve medical practise, as Fabrega seems to suggest, or are these improvements, when they arise, to be a product of more fundamental work in human biology? Non-medically qualified workers might wish to make suggestions about how existing treatments could be improved but this is to invite charges of straying into another's territory. Such work is more likely to gain acceptance if it can be shown to cast new light on aspects of biology fundamental to medical practice. Ideally, medical practice should be in keeping with the best understanding of human biology – and this can only be done properly against an evolutionary background. It follows that if Darwinian medicine is to gain serious acceptance by the medical profession, it needs to be presented by non-medically qualified workers in a way that appeals to medicine.

Traditionally, medicine has been seen as an art and, despite its reliance on sophisticated science-based technologies, remains so. Darwinian medicine, however, is a science. Medicine only relies upon those sciences that have something to offer it. If Darwinian medicine is to have as much to offer as it perhaps could, it must have a clear sense of individuality – it should have its own style and language. Work in Darwinian medicine by those outside the medical profession

needs, therefore, to be quite distinct and established in its own right and should not simply be work allied to the usual medical goals with a Darwinian perspective 'bolted-on'.

When exploring new ways of thinking, it is sometimes useful, as a thought experiment, to reverse standard thinking. For example, it is frequently reported that eating fruit and vegetables helps reduce the risk of developing certain cancers. To a worker in Darwinian medicine, this is to see the problem the wrong way round. It is not that eating fruit and vegetables helps reduce the risk of certain cancers but that under-consumption of fruit and vegetables, in relation to human design, increases the risk of developing those cancers. The bias of the first approach is to tolerate potentially harmful modern eating patterns and attempt to attach an anti-cancer fix. The second approach recognises the root of the problem – that we are poorly suited to the diets we currently choose – and seeks to return to something more fitting. This may sound like a game of semantics but the underlying message is distinct, if subtle: organisms are built to live and survive in their ancestors' environments. When those environments change slowly, organisms can evolve accordingly and there may be no problem. Mankind's self-made environment has changed too much, too rapidly.

Lest Darwinian medicine be charged with forever looking back to some Golden Age, an example from space flight is interesting to consider. If Man is to spend extended periods in space, it is important to understand the effect of weightlessness on the body. Results of studies in space flight physiology show that there are progressive losses of bone mineral density and muscle mass during a flight. A considerable amount of time is, therefore, spent exercising in order to put the

necessary stresses through those tissues so that they can respond in a trophic manner. Whereas space flight physiologists ask about the effects of zero gravity, using the same data, Darwinian medicine would ask about the effects of 1G. Losses in bone mineral density and muscle mass during space flight point to how the body must undertake a constant turnover in these tissues back on Earth. To simply live under normal conditions requires active physiological responses. Adequately maintaining these responses is, therefore, a health issue.

These are examples of how, by taking a different gaze at familiar as well as new data, Darwinian medicine can offer new insights into not only issues relating to health and disease but to the phenomenon of life in general. Darwinian medicine should be doing this not from the confines of medical problems alone but in its own distinctive biological way.

If the term 'Darwinian medicine' is split into its constituent notions of 'Darwinism' and 'medicine' and one asks what it is that most concerns 'medicine', one possible answer is the cure of disease and the enhancement of health. Broadly speaking, Darwinian medicine could be divided into 'Darwinian approaches to health' and 'Darwinian approaches to disease', the former using Darwinian principles to maintain and enhance health, the latter using those principles to respond to disease. Thus, the future development of Darwinian medicine may have two strands.

One important task that Darwinian medicine might achieve is to direct the attention of Western medicine and related sciences away from the white, 70 kg adult (non-pregnant by definition) male as the representative human entity to a more individualized approach. One

might also ask what balance between the ages and the sexes might be expected if one could address the medical needs of the human species *de novo* – that is, free from the historical background and influences that have gone into shaping the present approach. It is also interesting, in this context, to compare the layouts of textbooks of anatomy, physiology and pathology and to note how they reflect the interests of the audience for whom they are written more than the organism about which they are written. Indeed, what form would such texts take if written from a wholly Darwinian perspective?

Interestingly, there is as yet no collective noun to describe the adherents of Darwinian medicine. The terms 'Darwinian Doctors' or 'Darwinian Medics' both imply medical qualification and, as has been suggested, it is from outside medicine that significant advances should be encouraged. 'Darwinian Health Scientist' is another possible term. It has the attraction of keeping the focus on health (and, by association disease) as well as denoting a clear scientific emphasis. One does not mean or wish to rename the discipline 'Darwinian Health Science', however attractive that idea might seem and yet, a greater distinction or separation from professional medicine as suggested by this term would be advantageous in opening up the discipline to wider scrutiny and involvement – by human biologists in particular<sup>1</sup>. When addressing problems of relevance to the medical profession, human biologists are less likely to be encumbered by the ethical demands that enmesh medicine and more likely to be able to reach dispassionate conclusions which, as a result, may be quite unique.

Some of the points raised so far address some quite important issues relating to the conduct of Darwinian medicine. One might ask what is the most fundamental issue facing such a discipline. The notion of a

'zeroth' law has occurred in thermodynamics (as well as in Isaac Asimov's science fiction concerning robots). Here, a law was found that had precedence over what had already been formulated and numbered. Renumbering was out of the question. So a 'zeroth' law was devised to precede the first law. No laws numbered or otherwise exist in Darwinian medicine, however, a lesson may be learnt: that one should have in mind what is most fundamental to one's discipline. One might think that what precedes and underpins the whole enterprise of Darwinian medicine is the principle of adaptation and that the adoption of an adaptationist program is the 'zeroth law'. Intellectually, the discipline certainly has its roots here and this may indeed be one answer. But there may be a principle more fundamental to conducting the whole enterprise successfully in that it is fundamental to conducting any scientific enterprise successfully, namely, that a discipline must think and speak in its own terms. If its findings can be applied elsewhere, they should be translated into terms which can be understood by the recipient. Whether or not Darwinian medicine will develop its own language remains to be seen but it certainly must develop its own voice more clearly. The question of a 'zeroth law' is a contentious one, however, and what is given here will probably not find universal acceptance. But let that be a source of debate.

It has been the purpose of this brief account to ask some critical questions of Darwinian medicine but not in any way to imply an attitude of denigration. Not least, the issue of operating as a discipline distinct from medicine has been emphasized. It is believed that a lack of critical enquiry is not in the best interests of any discipline. It is our aim that these and other such questions might contribute to the future

intellectual development of Darwinian medicine as a much fuller and more fertile academic discipline.

### **Note**

<sup>[1]</sup> 'Health Science' can be found in the titles of many degree programmes currently available in the UK. These are not only numerous but somewhat disparate in that the few common threads which they share often reflect more on institutional bias than intellectual unity. To use the term 'Darwinian Health Science' may have its drawbacks – at least in the UK.

### **Bibliography**

Although certain works are mentioned in the above text, given the nature of the present work, the following bibliography is given more in the form of a 'further reading' list than as a list of cited work. In this way, it is hoped that interested colleagues will be offered a wider range of relevant material.

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