

Alfred Russel Wallace and the elimination of the unfit

The differences between Charles Darwin's and Alfred Russel Wallace's theories of natural selection have been discussed for many years, with particular attention to their varying thoughts on sexual selection, whether competition occurs primarily between individuals or varieties, and how human consciousness evolves. Potentially the most important difference between their respective points of view has, however, been largely overlooked. Darwin's natural selection, later characterized as the 'survival of the fittest,' contains an 'adaptation results in adaptations' logic that some have criticized as tautological (Lewontin 1984) or even teleological (Reiss 2009). This inelegancy has been tolerated because the theory's stated premises (i.e. the presence of a limited resource base, coupled with variation within populations and the potential for procreation to the point of superabundance) remain as unassailable now as they were originally. In a paper in the journal *Complexity* (Smith 2012), however, I argue that Wallace's conceptualization, focusing on an elimination (or extermination) of the unfit driving mechanism, might represent a better vehicle for relating natural selection to other evolution-related phenomena such as mass extinction, divergence, speciation and the origins of variation itself.

Wallace's natural selection emphasizes ecological interactions. Bateson (1972) noted his use of the steam engine governor analogy as a means of describing its operation in the famous essay 'On the tendency of varieties to depart indefinitely from the original type' (Wallace 1858; see excerpt below), and went so far as to interpret Wallace's thinking (see first quotation below) as the first example of cybernetic modelling. One immediate benefit of this kind of thinking is that it becomes easier to differentiate selection for domestication from 'natural' selection: in the former, the ideal of fitness is a predetermined one and is deliberately selected for, whereas in the latter, removal is not predetermined, leaving successful adaptation a function of environmental engagement – of whatever sort. Importantly, such engagement can then be considered in independently conceived ecological and biogeographical terms, thus focusing on assembly rules and eliminating the tautological trap. Darwin, by contrast, once stated: 'It is a beautiful part of my theory, that domesticated races of organics are made by precisely same means as species – but latter far more perfectly and infinitely slower' (Darwin 2002).

Further discussion of this matter can proceed elsewhere. As a first step, however, it is essential workers at least come to grips with the idea that Wallace really *did* think in 'elimination of the unfit' terms, and consider how this framework might lead us in new directions. To that end I have compiled a set of excerpts from Wallace's writings that should leave few doubts on that score:

The action of this principle is exactly like that of the centrifugal governor of the steam engine, which checks and corrects any irregularities almost before they become evident; and in like manner no unbalanced deficiency in the animal kingdom can ever reach any conspicuous magnitude, because it would make itself felt at the very first step, by rendering existence difficult and extinction almost sure soon to follow. (Wallace 1858, p 62)

Natural selection . . . does not so much select special variations as exterminate the most unfavourable ones. (from a famous 1866 letter to Darwin reproduced in Marchant 1916)

In the case of butterflies the argument becomes even stronger, because the fertility is so much greater, and the weeding out of the unfit takes place, to a great extent, in the egg and larvæ state. (Wallace 1877, p 405)

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Natural selection, as we have seen in our earlier chapters, acts perpetually and on an enormous scale in weeding out the 'unfit' at every stage of existence, and preserving only those which are in all respects the very best. (Wallace 1889, p 295)

The survival of the fittest is really the extinction of the unfit. In nature this occurs perpetually on an enormous scale, because, owing to the rapid increase of most organisms, the unfit which are yearly destroyed form a large proportion of those that are born. (Wallace 1890, p 337)

The law of survival of the fittest has such enormous selecting power because of the overwhelming odds against the less fit. (Wallace 1892, p 750)

The survival of the fittest is really the extinction of the unfit. Natural selection in the world of nature is achieving this on an enormous scale, because owing to the rapid increase of most organisms a large proportion of the unfit are destroyed. In order to cleanse society of the unfit we must give to woman the power of selection in marriage, and the means by which this most important and desirable end can be attained will be brought about by giving her such training and education as shall render her economically independent. (Wallace 1893, p 3)

I believe that the unfit will be gradually eliminated from the race, and human progress secured, by giving to the pure instincts of women the selective power in marriage. (Wallace 1894, p 87)

Without making some numerical estimate of this kind it is impossible to realise the severity, of the struggle continually going on in nature and the resultant elimination of the unfit. (Wallace 1895, p 438)

Accepting, then, these facts of variation, and always keeping in mind the severity of the struggle for existence, nine tenths at least of the progeny of the higher animals perishing annually before reaching maturity, thus leading to a systematic and continual weeding out of the less fit . . . (Wallace 1896, p 482)

It would operate, not as among the lower animals and plants by the actual destruction of the unfit, but by their less rapid increase, since, under equal conditions of education and mode of life, it is certain that marriage would be delayed till some industrial success had been reached by both parties. (Wallace 1900, p 514)

There are some writers who admit all the preceding facts and reasoning, so far as the action of natural selection in weeding out the unfit and thus keeping every species in the highest state of efficiency is concerned, but who deny that it can modify them in such a way as to adapt them to new conditions . . . (Wallace 1901, p 27)

In a prolonged drought it is only the tallest giraffes that find food enough to support life; and thus, by a periodical weeding-out of all but the very best – the fittest to survive under these unfavourable conditions – the standard of efficiency in each species is preserved by the rigid destruction of the less fit. (Wallace 1908, p 7)

Herbert Spencer suggested the term 'survival of the fittest,' as more closely representing what actually occurs; and it is undoubtedly this survival, by extermination of the unfit, combined with universally present variation, which brings about that marvellous adaptation to the ever-varying environment, which is an essential feature of every living creature which survives to produce offspring. (Wallace 1909, p 424)

...so that there would be ample time for the better adapted portion to raise its standard year by year, owing to the regular elimination of the less fit in regard to this special enemy. (Wallace 1909, p 430)

The facts already given with regard to the universality of variation, enormous powers of multiplication, and incessant weeding out of the unfit afford a complete explanation of the phenomena of colour, in all their variety and beauty, while no other adequate explanation has ever been set forth, or even attempted. (Wallace 1909, p 432)

Others are so imbued with the universality of natural selection as a beneficial law of Nature that they object to our interfering with its action in, as they urge, the elimination of the unfit by disease and death, even when such diseases are caused by the insanitary conditions of our modern cities or the misery and destitution due to our irrational and immoral social system. (Wallace 1913, p 112)

The survival of the fittest is really the extinction of the unfit; and it is the one brilliant ray of hope for humanity that, just as we advance in the reform of our present cruel and disastrous social system, we shall set free a power of selection in marriage that will steadily and certainly improve the character, as well as the strength and the beauty, of our race. (Wallace 1913, pp 152–153)

This array of selections, chosen from writings appearing over a 55-year period, should hopefully make the point.

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