

APPENDIX D: 'THE CENTENARY OF DARWINISM' BY R. A. FISHER (1959)

This paper, hitherto unpublished, was read at a meeting held in Adelaide in 1959.

The great advantage of celebrations of Centenaries lies in the opportunity they afford to consolidate what has been learnt in a century, and to fix in orderly relation to each other, and to the whole, the diverse movements, some fruitful, some abortive, which confuse the history of current events. A century affords an opportunity of taking a bird's eye view, and of eliminating unjust and erroneous opinions more speedily than would happen in the absence of such a periodic stocktaking.

What was accomplished by Darwin was not one task but two. Each [was] of considerable magnitude, requiring the marshalling of bodies of evidence, each detail of which was familiar to many of his predecessors, but [which] had not been assembled to constitute a coherent doctrine. Each side of his task encountered much prejudice and opposition, and required the strict logical examination of many related possibilities. Each also had been a subject of some controversy, with its tendency to the taking of sides, and the hardening of prejudice. Neither was capable of doing much without the other, for the two things that had to be done were, *first*, the establishment of the Historical Fact of descent with modification throughout the organic world, and *secondly*, production of a philosophically rational explanation of the fact, or a theory of the *means* of modification in the course of descent.

In each of these fields Darwin had many predecessors; what was unprecedented was their treatment by Darwin as but two aspects of a single problem.

The conjecture of transformism

As a philosophic conjecture, similar to some of the cosmological conjectures of our own day, the idea of transformism is extremely ancient. Greeks, and probably Indians, played with the notion. Lucretius, in many ways a precursor of modern science, certainly took it literally. Buffon, to whom the eighteenth century philosophy of the Age of Reason owed much, was also attracted. He had the wisdom not to discuss possible means, but to stick to the evidence for the fact. By about 1790, thinkers in many countries, Erasmus Darwin, Isadore Geoffrey de Saint-Hilaire, and Goethe all advocated the idea, with somewhat vague speculation as to causes. Lamarck was much more ambitious. His ideas were, however, equally speculative, and

were exposed to trenchant criticism and rejection. It was not logically necessary, but quite in accordance with scientific controversy in fields where little is known, that the rejection included transformism itself, as well as its supposed mechanism, so that from the time of Cuvier to Charles Lyell's *Principles of geology* (1831), and indeed until the *Origin* itself, orthodox opinion ignored or dismissed the genealogical unity of the animal and plant kingdoms. The movement of thought started by Buffon had been frustrated by premature and unconvincing speculation, rather as the early geological evidence for continental movements, before the decisive evidence of Rock Magnetism, was largely neutralized by the speculative discussion of its possible but implausible causes. Still, the persuasive evidence for transformism remained, and was indeed quietly receiving massive accretions with the progress of the biological sciences, so that before the *Origin* was published, many new writers, though often timid and confused, had given support to the principle.

The first part of Darwin's task, then, was to present the historical fact of organic evolution for the reconsideration of the biologists of his day, in spite of a congealed and indurated doctrine to the contrary. His contribution was to transform the theory from an arid speculation to a *unifying principle* in which whole vast bodies of fact could be given coherence and intelligibility. His observations on the *Beagle* enabled him to mobilize an avalanche of facts relating to such fields as Geographical Distribution, Geological Succession, the principles of Classification, the affinities displayed in Embryology.

These facts were, of course, due mostly to the labour of others during the two generations since his grandfather's time. The suggestive character of each element had probably been appreciated by others. The labour of the collection and organization of the whole *corpus* was Darwin's, and it is a labour which he could scarcely have attempted and still less brought to completion had he not found in Natural Selection the key which his mind was seeking. His logic demanded not merely a *theory of causation* for the transformation of species, but a theory dependent on *known*, or independently verifiable causes. It was only with such a key that he could hope to persuade such weighty and critical minds as those of Hooker, Lyell, and Thomas Henry Huxley.

It is, I believe, only in the light of contemporary literature and private letters that it is possible to dispose of the rather trivial stress often laid by later writers on the numerous partial anticipations of many of Darwin's ideas. This exaggeration seems to flow out only from an imperfect acquaintance with what was known to others—often it had been known for generations—but to the illusion that original thought in the sciences is to be thought of as having no roots at all, but to be imported like Fire by Prometheus. However, originality in the sciences, as in practical life, is usually

displayed by perceiving the application of a particular thought or process. The basic idea of Evolution was unimportant and sterile in the generation before Darwin's return in the *Beagle*; after 1859 it became the most fruitful idea in the biological sciences. Equally, it might be said that the idea of Selection, widely familiar as it was to stock breeders from ancient times, gave little to Biological Science until Darwin married it to the theory of the organic transformation in plants and animals.

Natural selection

Good writers, however, oversimplifying by taking the part for the whole, have often written as though the bare idea of selection was the whole of Darwin's contribution. The attitude is illustrated and, I think, intentionally satirized in Huxley's reaction to the *Origin*, 'How stupid of me not to have thought of that'. For the notion of selective modification is very simple, and was in certain circles very familiar. The bridge between the traditional lore of the stock breeder, and the Theory of the Organic World was not however easily crossed; very few could imagine that the effects of selection transcended specific boundaries. Consequently, and especially by reason of the immense fame of Darwin's work, the curiosity of the learned world has been rewarded by the discovery of a great many so-called 'anticipations', of particular fragments of Darwin's theory.

Samuel Butler, a witty and imaginative writer, without the discipline of mind to be gained from serious study in the Natural Sciences, recklessly accused Darwin of plagiarizing of, among other people, Lamarck, whose theory had formed the major obstacle to the learned world building on the foundation provided by Buffon and his followers.

With respect to the principle of Natural Selection, Darwin affixed to the later editions of the *Origin* an 'Historical Sketch' in which he refers among other works to Wells' *Two Essays upon Dew and Single Vision* (1818) in which, however, Wells applies the principle only to Man, and to Patrick Matthews' work on *Naval Timber and Arboriculture* (1831) in an Appendix to which there is a discussion showing that Matthews understood the principle perfectly. Since then the late Professor E.B. Poulton has called attention to J.C. Prichard's *Researches into the Physical History of Mankind* in the second edition of which (1826), though not in subsequent editions, Prichard goes far to anticipate Darwin and very thoroughly anticipates Weismann. More lately, L.C. Eiseley in the *Proceedings of the American Philosophical Society* (Vol. 103, pp. 94-158 (1959)) has given 60 large pages to exhibiting one Edward Blyth, as the true progenitor of Darwin's ideas.

The correspondence of words and thoughts adduced are really trivial. The men were nearly of the same age, both sedulous readers of the same periodicals, and therefore having the same oddities, such as the Ancon

sheep, frequently brought to their notice. They were both inheritors of a tradition of animal and plant breeding in which the practical efficacy of artificial selection was universally recognized. Blyth was not even an evolutionist, but like Lyell at the same period, accepted the theory of *Special Creation*, with its closed species. He had no stimulus to explore the exciting possibility that the very tool on which breeders of animals and plants had learnt to rely was in verity the means by which these species had come into existence. His reasoning could supply little inspiration to young Darwin, save possibly as a foil, or a reminder of fallacious arguments which ought to be answered. If forerunners are wanted, many more interesting ones have been uncovered than Edward Blyth.

No case could illustrate more strongly the fact that any reconsideration of Darwin's contribution should consider its scope and magnitude as a work of co-ordinated reasoning, and that it is fatal to lay stress on singular details.