*The Refutation of Darwinism, and the Converse Theory of Development, based exclusively upon Darwin's Facts. By T. Warren O'Neill, member of the Philadelphia Bar. J. B. Lippincott & Co. $2.50.

A PHILADELPHIA LAWYER'S VIEWS OF DARWINISM.*

WITHOUT pronouncing upon the merits of the question at issue between Mr. Darwin and his reviewers in general, we can confidently say of this legal critic that he is far inferior to the English naturalist, both in rhetorical tact and in logical knowledge. To say the least, it is very *impolitic* to attempt a refutation of Darwinism by bringing railing accusation against the author of the system. But we find Mr. O'Neill (where at the worst nothing more than faulty logic could be alleged) charging Mr. Darwin with resorting to "a most clever trick" (p. 118) of assuming a "child-like and bland comportment, from which has enured to him a reputation for candor," but denies that he is ever candid except where compelled to be so (p. 264). He speaks of Mr. Darwin's hypothesis concerning the benefit of cross-fertilization as a "makeshift of ignorance," and a "senseless generalization" (p. 211). Mr. Darwin's logical incompetence affords Mr. O'Neill "inexhaustible amusement" (p. 233), and repeatedly the "cream of the joke lies," according to our author, in something or other that Mr. Darwin does not understand (pp. 203, 349). See further equally offensive remarks on pages 356, 371, 383, 405, 410.

On directing attention to the *argument* of this criticism we find that Mr. Darwin is really berated for his *caution*, and ridiculed for his *modesty*, by an author who confessedly takes all his facts from the one he traduces, and who, from beginning to end, misconceives the argument he is criticising. Mr. Darwin cautiously propounds an hypothesis to explain an immense body of incontestable facts. Mr. O'Neill dogmatically theorizes upon the smallest possible stock of facts.

For example, Mr. Darwin is a practical naturalist. As such he has thrust upon him in the study of plants and animals a vast number of facts to be classified and explained. There is the arrangement of species in clusters, like planets and their satellites; the persistent anatomical similarity in all species of the same class, even to the existence of the useless rudiments of abortive organs, together with the uniformity of embryological development; the growing difficulties of classification through the discovery of intermediate forms; and the distribution of species in space *as though* dispersed from a common center, and in time *as though* they were genetically connected. The fitness of Mr. Darwin's theory of the derivative origin of species, to explain these facts, is its own proof. But two classes of facts among others interpose objections. First, *hybrids* are sterile; second, *close interbreeding* tends to sterility. Mr. Darwin frankly and fully states all the grounds for these objections, and then proceeds to show that their bearing against his theory has been overestimated; pleading that the cause of the sterility of hybrids is unknown, and may

arise naturally through increased and unobserved differences of organization, therefore, since "ignorance can interpose no objections," this difficulty is not fatal to his theory. The evil effect of close interbreeding is a more serious objection, since it would seem to forbid the continued union of favored forms, and so strangle at the start the law of "natural selection." Mr. Darwin's statement of these adverse facts is the fullest that has been made by any one, and shows the scientific *candor* of his mind. His subsidiary hypothesis, that the process by which one species has been derived from another has been exceedingly slow, is intended to obviate this latter objection.

Mr. O'Neill falls into the mistake of supposing that the elaborate effort of Mr. Darwin both to state and rebut objections is his main argument, and makes scarcely any allusion to the positive facts above referred to, which are forcing naturalists almost universally to adopt theories of evolution of one kind or another.

The theory by which Mr. O'Neill accounts for the individual variations in plants and animals under domestication is that of reversion. According to him, the present "races are, all, but various degenerations of the one specific type of the given species" (p. 61); and "there is but one *normal* mould for all the individuals of the same species. . . . The mould, however, has been bent and distorted into every conceivable diminished shape and size" (p. 152). When individuals of opposite "distortions" come together, they counteract each other's defects, and their offspring revert to the original "moulds." But it will be readily seen that even according to this theory, positive as well as negative variations and *distortions* do arise (for example, in size and color), of which our author can give no better account than Mr. Darwin; while the latter has the frankness to say that the cause is to him, as yet, an insoluble mystery, for which he can get no better statement than that it is a "great law of nature." But to Mr. O'Neill there is no insoluble mystery here or anywhere else. How easy it is upon such a point to deceive one's self with phrases, will be seen in one or two quotations from our author, which may speak for themselves:

> The cause of the sterility, and of the lessened fertility, among individuals of a variety deficient in features of its specie is, that there are not sufficient characters in those individuals, to impress their reproductive tissue with due formative power. [p. 423.]

The infertility of hybrids arises from the fact that

> the aggregate [of character] determines to a point or points *other than those devoted to purposes of exudation*. In hybrids there is a physical impossibility of the two forces uniting, through each of them pursuing an absolutely different rhythm. [p. 425.]

It would have been well for Mr. O'Neill, at this point, to have reflected upon the criticisms which can be made, and have been made, upon the theory of gravitation. In the spirit of our author's objections to Mr. Darwin, it would be said that the theory of gravitation does not explain the solar system, because gravitation itself still awaits explanation. And this is true if the word explanation is used so comprehensively that it loses its sense altogether. But what Newton did, was to discover a "great law of nature." The most he could say was that the members of the solar system moved *as if* their motions were the resultant of two forces (the centripetal and the centrifugal) acting at right angles to each other. The object of study was the *course of nature* in this class of facts. The causes introduced into the theory were, by the hypothesis, *secondary causes*. Philosophers are at liberty to seek for still more general causes, or for a "wider law of nature" which encircles these; but in doing so they should remember that they are in an actual world, where theories are trustworthy only as they repose on facts.

It would exceed both the limits and the province of this review to enter further into particulars. But let it be repeated that Mr. O'Neill makes no effort either to explain or explain away the vast and complicated body of facts enumerated above, upon which Mr. Darwin's theory relies for positive support; while Mr. Darwin does, with tolerable success, explain away many of the apparently adverse facts, and endeavors in a legitimate way to show that we are not warranted in asserting that the conditions which seem to set a limit to variation are fully understood by us, and that they have always been the same as those whose effects have come under our observation. The limiting facts concerning the increased fertility of crossed varieties and the sterility of hybrids, Mr. Darwin disposes of by an elaborate collection of facts showing that we are ignorant of the causes which produce this paradox, and by a subsidiary hypothesis, resting upon many analogies, in which the development of species has been compared by Prof. Asa Gray to the movement of a wheel with a ratchet. Mr. O'Neill's doctrine of limits here turns upon himself. Because slight variations in form promote fertility, it does not follow that still larger variations will have the same effect; and because continued close interbreeding is fatal to certain extreme forms of variation, it is not necessarily so to other forms. Nor is close interbreeding a necessity under Darwin's theory, since his new species are not supposed to arise from monstrosities, like the Ancon sheep, but by a slower accumulation of slight peculiarities, in which different individuals may independently agree in variation.

Our conclusion, on laying down this volume, is that the customs of the court room and the habits of the advocate are not favorable to the settlement of such questions as Mr. O'Neill has here undertaken to discuss; and that wisdom in these matters is likely long to remain with the naturalists rather than with the lawyers. The facts under consideration are not such as the members of the bar are accustomed to deal with.

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