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SCIENCE.

Erasmus Darwin. By Ernest Krause. Translated from the German by W. S. Dallas. With a Preliminary Notice by Charles Darwin. (Murray.)

IT has often been remarked how frequently close observers or deep thinkers of one generation seem just to have missed a discovery which is reserved for a future generation. They go round and round the central truth, and appear almost on the point of reaching it, when they are carried off on to a wrong track by the want of a sufficiently wide array of facts or of sufficiently accurate appliances for observation, or by the trammels of an erroneous habit of thought. This was the case with the remarkable man whose biography lies before me. There is scarcely one of the recent discoveries of biological science which is not foreshadowed in his copious writings; and yet, from want of a link here, or in consequence of an erroneous interpretation there, his theories failed to connect themselves into a workable system, and were treated by his contemporaries as the vagaries of an eccentric man of genius. His works are even now regarded as little better than scientific curiosities, and the superstructure built on his foundation by his illustrious descendant is attributed entirely to the latter. It is the works of Charles, and not of Erasmus, Darwin that mark the passage from the dimness of the Middle Ages of scientific thought to the bright light of modern research.

Merely to enumerate the instances in which Dr. Darwin had a more or less clear prevision of the theories or of the discoveries of the last five-and-twenty years would occupy considerable space. I will allude to some of the more interesting, not in the order of their importance, but in the sequence in which we come across them in his works taken chronologically.

Dr. Darwin stated his belief that all the calcareous earth in the world was formed originally by animal and vegetable bodies from the mass of water. He anticipated Haeckel in referring fungi to a kingdom connecting plants with animals. The occurrence of useless rudimentary organs in animals and plants he attributed to the ancestral possession of these organs in a functional condition, and their gradual abortion from disuse. In the following sentence from *The Economy of Vegetation*, we have a clear foreshadowing of the modern doctrine of evolution:—

"Were all the ammoniae [ammonites] destroyed when the continents were raised? Or do some genera of animals perish by the increasing power of their enemies? Or do they still reside at inaccessible depths in the sea? Or do some animals change their forms gradually and become new genera?"

The elder Darwin did good service in opposing the false teleology and natural theology of the times in which he lived, and in pointing out that the final cause of animal or vegetable phenomena must be looked for, not in their ministration to the delectation of man, but in their advantage to the animal or plant itself. Even the very recent observations of Kerner* as to the object of spines, viscid hairs, essential oils, &c., in warding off "unbidden guests," are foreshadowed in *The Botanic Garden*.

Notwithstanding that Kölreuter's and Sprengel's works were published during the lifetime of Dr. Darwin, the part played by insects in promoting the fertilisation of plants and the advantages of cross- as opposed to self- fertilisation never presented themselves to his mind. Here was lost one link which prevented his observations becoming the starting-point for new discoveries, as those of his grandson have been. In regard to the function of the nectaries of the flower and of the other parts of plants, he approximated more nearly to the most recent theory of M. Bonnier, that they serve as reservoirs of food material for the development of the fruit and other organs. The habits of "carnivorous" plants he made a subject of special study; and he even suggests that "digestion" is a physiological process not peculiar to the animal kingdom. The protective mimicry of the colours of birds, birds' eggs, frogs, and fish was familiar to his mind. The modern theories of Sexual Selection and the Survival of the Fittest are anticipated in the following sentence:—"The final cause of the contest among the males seems to be that the strongest and most active animal should propagate the species, which should thence become improved." This was written in 1794.

I have omitted in the above account of the most conspicuous points of Dr. Darwin's teaching many others of scarcely less interest; and have not referred to the crude and erroneous theories with which these were mingled, the natural product of the age in which he lived. In conclusion, the following extracts from his posthumous work, *The Temple of Nature*, written in 1802, need no comment as to their relation to the theory of evolution and to the modern discoveries of embryology:—

"Organic life beneath the shoreless waves
Was born and nursed in ocean's pearly caves;
First forms minute, unseen by spheric glass,
Move on the mud, or pierce the watery mass;
These, as successive generations bloom,
New powers acquire, and larger limbs assume;
Whence countless groups of vegetation spring,
And breathing realms of fin, and feet, and wing."

"Imperious man, who rules the bestial crowd,
Of language, reason, and reflection proud,
With brow erect who scorns the earthy sod,
And styles himself the image of his God,
Arose from rudiments of form and sense
An embryon point or microscopic ens."

There can be little doubt that La Marck was largely indebted for his views to the author of *Zoonomia*; and I do not think that the biographer of Dr. Darwin exceeds a just estimate of his merits when he says, "He was the first who proposed and consistently carried out a well-rounded theory with regard to the development of the living world." In private life he was the amiable, accomplished, and popular physician; the friend of Mr. Wedgwood, of Mr. Edgeworth, and of Dr. Day (author of *Sandford and Merton*); the ardent friend of every philanthropic movement and every social reform; in religion a pure theist, and therefore, of course, denounced as an atheist. The German biographer of Erasmus Darwin and his English translator have done good service in rescuing from comparative oblivion a keen reasoner and clear-sighted observer of whom our country may well be proud.

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Grammaire comparée des Dialectes basques By W. J. van Eys. (Paris: Maisonneuve; London: Williams & Norgate.)

FOR a certain class of minds Basque possesses much the same fascination as Etruscan. In both cases we are confronted by the same philological problem, though the materials for solving it are immeasureably more abundant in the one case than in the other. What are the other known languages of the world to which we can affiliate the dialects spoken by a small group of mountaineers on the frontiers of France and Spain? What was the form of the mother-tongue which these dialects presuppose? Was it the language of the inhabitants of the Spanish peninsula, or of a portion of the peninsula, before the days when the Romans imposed their rule and their speech upon them? Such are the questions started by the mysterious Basque or Eskuara, which, even without them, would offer points of supreme interest to the student of language.

It is only within the last few years that the Basque dialects have been studied scientifically; indeed, it is only within the last few years that it has been possible to do so. Prince L. L. Bonaparte's magnificent work on the *Verbe basque* (1869) has been followed by Ribary's Basque grammar, translated into French by M. Vinson under the title of *Essai sur la Langue basque* (1877), and the Basque dictionary of M. van Eys (1873). The latter scholar had already published a grammar of

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