

and telegrams received by Dr. Dohrn. Amongst others, I noticed addresses coming from Munich, Frankfurt, St. Petersburg, Moscow, Danzig, Turin, the Société Helvétique, and the Society of Naturalists in Naples. England was represented by a beautifully-illuminated address from the Royal Society, and also by addresses from the Marine Biological Association, Plymouth, the Cambridge Philosophical Society, and the Board of Biology and Geology at Cambridge.

The speeches themselves, though very interesting, were somewhat lengthy withal. As the audience consisted mostly of Germans and Italians, the speeches were arranged so as to be spoken more or less alternately in either language. The proceedings were opened by Prof. Todaro, of Rome, who referred at some length to Spallanzani, who had engaged in marine biological work on these very shores. He was followed by Prof. His, who gave some account of the history of the Station since its foundation. He also read an address signed by nearly two thousand naturalists, from almost every country in Europe. The next to speak was Prof. Waldeyer, of Berlin, who brought an address from the Berlin Academy, and who mentioned the fact that he was the first student to work at the Station, at a time when the resources and equipment were very different from those of the present day. He also dilated on the manifold uses, in many departments of science, to which a Marine Zoological Station can be put. Next came the Syndic of Naples, who presented Dr. Dohrn with the freedom of the city; and then Admiral Palumbo, the Under-Secretary of State, made a short speech. The Minister of Public Instruction, who followed, presented Dr. Dohrn with an order, the "Grand ufficiale della corona d'Italia," and brought the congratulations of King Humbert.

Thus far the proceedings had been very stiff and formal, and even solemn in their nature, so the German Ambassador from Rome endeavoured to instil a little humour into his speech. In this there was frequent reference to the Kaiser, who sent his best wishes, and mentioned his interest in science. The Ambassador remarked, also, that Italy and Germany, closely connected by political ties, had an additional bond of friendship in the Stazione Zoologica.

Then came the speech of the day, from Dr. Dohrn himself. This was, of course, spoken in German, but copies of it, printed in Italian, were circulated amongst the Italian members of the audience. This admirable and highly-interesting speech was of somewhat more than half-an-hour's duration. Dr. Dohrn said that he had himself intended to make this day merely an occasion for recalling the memories of persons connected with the Station, and also the scope of the Institute; but his friends had desired to celebrate it with more ceremony, and for this he begged them to accept his most profound gratitude. He referred in very feeling terms to his father, but for whose liberality it would have been impossible to bring his enterprise to a successful issue. Biologists, he remarked, continually speak of protoplasm, the basis of all things living, the substratum of all animal and vegetable life. But there is in man, also, a psychical protoplasm. It was this psychical protoplasm in which was originated the first idea of the Stazione Zoologica, and this he owed to his father. Next to his native forests in Pomerania, the strongest passion of his father was for Italy, with its ancient culture, with the splendour of its renaissance, and its ancient music.

Dr. Dohrn then offered his grateful thanks to the people of Naples for allowing him to found his Station there, his especial thanks being due to the late Profs. Paolo Panceri and Salvatore Trinchese, of the Naples University. It was owing to Panceri's influence with the municipal authorities and the Government that a site for the Station was obtained in the *villa nazionale*. His thanks were no less due to the Italian Government for their moral and

material assistance. Fortunately, also, the Station was able to rely upon the tower of strength expressed in the words "Kaiser und Reich." Thus the Emperor William I. presented a considerable gift to the Station; whilst in the early days of its foundation, the time of difficulties, not a year passed but that the unfortunate Emperor Frederick wished to be informed as to its progress. Similarly, also, had the Kaiser William II. shown his sympathies. Also, King Victor Emanuel and King Humbert have extended their protection to the station.

Great, also, are the thanks due to the Imperial Government and the German Parliament. In accordance with an ancient custom, which comes from England, the mother of Parliamentary régime, proposals regarding demands on the exchequer may be initiated by the Government. On the strength of a petition signed by Helmholtz, Virchow and Dubois-Reymond, the German Parliament granted a large annual subsidy, which they gradually increased to 2000*l.* a year.

No less was his gratitude due to his English friends, for their help in the grave crisis which attended the Station at its origin. It will be to the lasting glory of the Station that it was largely subscribed to by Darwin. How great, also, were his (Dr. Dohrn's) thanks to his father for his liberality, and likewise to his father-in-law, who allowed him to use his wife's *dot*, which had been destined for furnishing their house, to pay debts on the Station. But the Station was always provided with everything necessary for research, and this appealed much more to his wife's heart than the furnishing of her own house.

It was impossible to thank every one to whom thanks were due, but to three corporations—the Academy of Sciences of Berlin, the British Association for the Advancement of Science, and the Smithsonian Institution of Washington—the prosperity of the Station was largely due, for their subsidising "tables" at the Station.

Finally, in the name of the Stazione Zoologica, were especial personal thanks due to his collaborators, particularly to Dr. Hugo Eisig, the first collaborator with him at the Station, and one who threw in his lot with him when the actual foundation of the Station was yet but a chance. And lastly, to all those who by their presence had set a sanction on these festivities, Dr. Dohrn wished to offer his most profound thanks for the great honour they had done him.

This brought the meeting to a close. In the evening the guests and members of the staff of the Zoological Station were entertained by Dr. Dohrn at dinner, at which in all some sixty people sat down. The speeches were again many in number, but were shorter and more humorous in nature. H. M. VERNON.

EDWARD DRINKER COPE.

THE death of Prof. Cope, of Philadelphia, which took place on April 12, has removed the man who, since Louis Agassiz, has been the greatest influence in American biology.

Born in Philadelphia on July 28, 1840, he passed from the University of Pennsylvania to Heidelberg, where he took the degree of Ph.D. in 1864. In that year he was appointed Professor of Natural Science in Haverford College in his native city, but resigned the post three years later, partly by reason of ill-health. During the years 1871 to 1873 he joined many geological exploring expeditions to Kansas, Wyoming and Colorado, and from 1873 to 1878 he was engaged in field-work with the Wheeler Survey of the United States Government. Th. Hayden Survey also had his services as vertebrate palæontologist. The results of his work in connection with these Surveys were published by the Government in many fine volumes—*e.g.* "The Vertebrata of the

Cretaceous Formations of the West," 1875; "The Vertebrata of the Tertiary Formations of the West," 1883; and "The Extinct Vertebrata obtained in New Mexico," 1877. It was in recognition of this work that, in 1879, he was awarded the Bigsby Medal of the Geological Society of London. The loss of a portion of his private fortune led Cope, in 1889, to accept the professorship of Geology and Mineralogy at Pennsylvania University. This post he held till 1895, when he was transferred to the professorship of Zoology and Comparative Anatomy. In that year also he was elected President of the American Association for the Advancement of Science. From 1878, with A. S. Packard, and from 1887, with J. S. Kingsley, he was a chief editor of the *American Naturalist*, a journal that has had its periods of financial difficulty and irregular publication, but which, under Cope's direction, has always been interesting, vigorous and independent, playing a much-needed part in a country where so much scientific work is under the control of political placemen.

Cope's zoological work has lain among the Vertebrata, especially their lower Classes. Beginning in 1859, with a paper on "The Primary Divisions of the Salamandridæ," published by the Philadelphia Academy, the stream of contributions poured out by him has reached a total of over four hundred. By his study of recent and fossil forms in conjunction, he has thrown much light on the history of the Reptilia and Amphibia, leading to many profound changes in classification. Two of his most important essays in this direction were those published so long ago as 1865-66: "On the Primary Groups of the Batrachia Anura" and "On the Arciferous Anura." His work on the extinct ancestors of the Amphibia, the direct progenitors also of the Mammalia, was some of the most successful and suggestive that he accomplished. His important paper on "The Systematic Relations of the Fishes" was published by the American Association in 1871; much of the material on which this was based was the famous collection of skeletons made by Prof. Josef Hyrtl, of Vienna, and acquired by Cope for his own museum. Cope was one of the first to deduce the Ungulata from ancestors with quadri-tubercular molars, and with five-toed, plantigrade feet. This was in 1874; and it was he too, who, some ten years later, was the first to maintain that this type of molar in the upper jaw was derived from a tri-tubercular type, while in the lower jaw it was derived from a quinque-tubercular type, or a tri-tubercular type with a heel supporting two additional tubercles. The additions to, and the discussions that have taken place around, this theory are well known. Cope's discovery of Phenacodus, the celebrated fossil ancestor of the Ungulata, proved in his masterly hands "an important event in the history of our knowledge of the evolution of the Mammalia." The sub-order to which it belongs, the Condylarthra of the Lower Eocene, "stands to the placental Mammalia in the same relation as the Theromorphous order does to the Reptilian orders. It generalises the characteristics of them all, and is apparently the parent stock of all excepting, perhaps, the Cetacea."

It was not, however, Cope's technical zoological work in the domain of Vertebrata, excellent though it was, that made him such an influence in American biology; it was his constant application of his results to wider philosophical problems, especially of evolution, both physical and metaphysical. He, more than any one (though the name of Alpheus Hyatt should not be passed by), has been the founder of that peculiarly American school of thought which has no doubt met with much opposition on both sides of the Atlantic, but which nevertheless has promoted discussion and investigation along many lines. Cope's main contributions to the philosophy of biology were first brought together in that volume of suggestive essays entitled "The Origin of the Fittest" (Macmillan: London and New York, 1887), while his conclusions were summarised, and his present position stated in the

"Primary Factors of Organic Evolution" (Open Court Co., Chicago, 1896). That position, as was abundantly evident from Dr. Russel Wallace's review of the last-named book in NATURE (vol. liii. p. 553), did not win the approval of our English ultra-Darwinians, nor, indeed, were the views of the American school easily approved by Darwin himself. But abuse and ridicule cannot hinder the admission that the conclusions (or speculations, if you will) of Cope and others did lead to the discovery and scientific coordination of many undoubted facts, having much bearing on questions of descent. Moreover, many of Cope's audacious hypotheses are now the commonplaces of evolutionists. It is nearly thirty years since his establishment of the doctrine that the development of new characters has been accomplished by an acceleration or retardation in the growth of the parts changed; an idea expressed independently by later workers as the earlier or later inheritance of acquired characters (Cænogenesis, Haeckel). Thus, the adult of an ancestral individual is the exact parallel of a younger stage in its descendant—a limitation of, and yet an advance on, Von Baer's statement of inexact parallelism. Cope, too, was the first to point out that genera—as genera then were understood—were "homologous groups" descended from other "homologous groups"; as we now say, genera are polyphyletic. Retaining the old boundaries of a genus, he regarded it as a grade of evolution. Nowadays there are some who maintain such orders, families and genera, though fully appreciating their polyphyletic origin; while others believe that a group of organisms once proved polyphyletic can no longer be regarded as a unit of classification. These latter workers seek to classify organisms according to their true lines of descent, and they therefore elevate as diagnostic other characters than those so regarded by their predecessors, characters as a rule less obtrusive and of less physiological importance. Whether the older view of Cope, powerfully expressed by Huxley in our own country, or this newer view ultimately prevail, the credit of first putting the problem is due to Cope.

More Lamarckian than Lamarck, Cope rendered the "besoin" of the French philosopher by "effort," regarding animals as in some sort working out their own salvation. The definiteness of variation, in which he believed, and the definiteness of evolution, which all accept, he imagined to be due to the action of a "growth-force" ("bathmism"), thus approaching the views of Naegeli. This force acts, according to Cope, through a kind of unconscious memory, with which faculty the reproductive cells are endued. Thus, as the result of his apparently mechanical conception of the details of evolution, he came at length, along a road that was all his own, to the conclusion of many a philosopher: "that consciousness as well as life preceded organism, and has been the *primum mobile* in the creation of organic structure . . . that the true definition of life is, *energy directed by sensibility, or by a mechanism which has originated under the direction of sensibility.*"

F. A. B.

NOTES

It has been felt by many entomologists, for some time past, that several of our more interesting and local British insects are in danger of extermination from over-collecting. Accordingly, the Council of the Entomological Society of London appointed a representative Committee to consider the matter. The Committee found themselves unable to recommend any means of affording protection by enactment, as has been done for birds, or even by approaching landowners to induce them to check collecting on property where such species occur. In many cases such insects are found on poor and uncultivated lands belonging to small proprietors, to whom the presence of an army of collectors is a source of profit. It was suggested, however,