

There may be many geologists in New South Wales ready to succeed Mr. Wilkinson in his post, but it will be difficult to find one possessing the same extensive geological and mineralogical knowledge, combined with so amiable a disposition and a readiness to impart information to those seeking it, which will cause his memory to be long held in esteem by all who had the pleasure to come in contact with him, whether officially or socially; and especially will his loss be deeply felt by a very wide circle of personal friends.

PHILIP HERBERT CARPENTER,

M.A., D.SC. (CAMB.), F.R.S., F.L.S.

BORN FEBRUARY 6TH, 1852. DIED OCTOBER 22ND, 1891.

PHILIP HERBERT CARPENTER, whose sad death we recorded in our last Number, was the fourth son of Dr. W. B. Carpenter, C.B., F.R.S. Born in Westminster, he was taught at University College School, and in 1871 went to Cambridge as a scholar of Trinity. In 1874 he graduated as B.A. in the first class of the Natural Science Tripos, and proceeded to the further degrees of M.A. in 1878 and D.Sc. in 1884. Between 1875 and 1877 he studied at Würzburg under Prof. Semper, and in the latter year was appointed assistant master at Eton College, being especially charged with the teaching of biology. This post he held until his death. In 1884, when his father received the Lyell Medal from the Geological Society of London, to Herbert Carpenter was awarded a moiety of the Fund. In 1885 he was elected a Fellow of the Royal Society, and he served on the Library Committee and Council of the Linnæan Society from 1887 onward.

By the death of Dr. Carpenter, at the early age of thirty-nine, we lose one of the chief authorities on Echinoderm morphology and the acknowledged leader in the study of the Crinoidea. For this position he was by his early training eminently fitted. As a boy his interest was excited by the researches which his father was prosecuting into the embryology and morphology of *Antedon*. When only sixteen he joined his father and Wyville Thomson on the deep-sea exploring expedition of H.M.S. *Lightning*, "manfully bearing no little hardship and helping to lighten the evil times to his seniors." It is interesting to remember that the chief incentive to that exploration was the discovery by Sars of new Crinoids in the North Sea two years before. In 1869 he was on the second and third cruises of the *Porcupine*, making analyses of sea-water, but no doubt keeping an eye on the many rare animals, especially Echinoderms, dredged by that vessel. The summer of 1870 was again spent on the *Porcupine*, this time in the Mediterranean. In 1875 he accompanied Sir G. Nares' Arctic Expedition as far as Disco Island, for the purpose of assisting in the dredging operations that were carried out there and in the North Atlantic by H.M.S. *Valorous*.

It was not, however, till September, 1875, that he turned his attention seriously to the Crinoidea, and then as it were by chance. His first studies at Würzburg were on "the minute anatomy of the genital glands in the Crayfish." It happened, however, that Semper and Ludwig had criticized certain statements of W. B. Carpenter

with regard to the arms of *Antedon*, and P. H. Carpenter naturally wished to examine Semper's material. Thus his first paper (Journ. Anat. and Physiol.) reconciled the views of his father and of his father's critics. The interest once aroused led him on to the investigation of the Philippine *Actinometrae*, placed in his hands by Semper, and after two years' work he presented to the Linnæan Society the important paper on that genus which is published in their Transactions. Meanwhile the *Challenger* expedition had returned, and in January, 1878, the description of the free-swimming Crinoids collected on it was entrusted to Carpenter by Sir Wyville Thomson. Thus his scientific career was determined, and from that time to his death, a constant stream of papers from his pen, on Echinoderm and especially Crinoid morphology, found their way to the Royal, Linnæan, Geological, and Zoological Societies of London; to the Quarterly Journal of Microscopical Science, the Annals and Magazine of Natural History, Zoologischer Anzeiger, and many other publications.

The report on the *Challenger* collection of Stalked Crinoids was to have been written by Wyville Thomson, but on his death in March, 1882, the work naturally fell to Carpenter. This report, published in 1884, and that on the unstalked forms, which appeared four years later, embody the main work of Carpenter's life: their accuracy and exhaustiveness are known to all who have to deal with Crinoids. This led to much other systematic work, such as that on the *Comatulæ* of the Leyden Museum, of the Hamburg Museum, of the Barent's and Kara seas, and of the Mergui Archipelago; besides much left unfinished on the Blake collections from the Carribean sea, the Crinoids from the Port Philip Survey, from Torres Straits and elsewhere.

What must strike any one who reads these reports is the constant allusion to fossil forms. The refusal to separate for a moment the animals preserved to us in the rocks from those living in modern seas, which distinguished Carpenter's work from that of most zoologists, constitutes his chief claim on the attention of the readers of this MAGAZINE. "I have," he said "the strongest conviction (and many mistakes would be avoided were it a universal one) that the only way to understand fossils properly is to gain a thorough knowledge of the morphology of their living representatives. These, on the other hand, seem to me incompletely known if no account is taken of the life-forms which have preceded them." And this conviction was acted up to: thus, even a new *Antedon* from the Mergui Archipelago was shown by him to throw light on the position of Jurassic species. No stronger argument than the extreme value of all Carpenter's palæontological papers can be needed to show the utter fatuity of ever expecting really good work to be done upon fossils by those who are prohibited from acquiring a practical knowledge of their living relations. For those, however, less fortunate than himself his help was always ready, and none will feel his loss sooner or more bitterly than they who have so often availed themselves of it in solving the many problems presented by the Crinoids

of the past. Besides many papers contributed to the Geological Society, Carpenter was joint author with Mr. R. Etheridge, jun., of the Catalogue of the Blastoidea in the British Museum; and the last number of the Journal of the Linnæan Society, published on the day of his funeral, contains a contribution to the Morphology of the Cystidea of the very highest importance (see *antea*, p. 135).

Carpenter's enthusiasm made him a keen controversialist, but his love of truth kept him open to every argument. He may have sacrificed brevity to exhaustiveness, but his conscientiousness has given to all his work the highest reputation for accuracy. These are the virtues of the man of science, but to them he added a kindness of heart and a bright joyousness of nature that leave us doubtful whether we have lost more in the teacher or in the friend.

Lists of Dr. P. H. Carpenter's papers, some written in conjunction with Mr. R. Etheridge, jun., are given in his two *Challenger* Reports, and in the Catalogue of the Blastoidea in the British Museum. To these the following list is supplementary.

1882. On the Relations of *Hyboerinus*, *Baerocrinus*, and *Hyboeystites*, Quart. Journ. Geol. Soc. vol. xxxviii. (No. 151), pp. 298–312, pl. xi.
1886. Note on the Structure of *Crotaloerinus*, Ann. Mag. Nat. Hist. ser. 5, vol. xviii. pp. 397–406.
1887. Notes on Echinoderm Morphology, No. 11; on the Development of the Apical Plates in *Amphiura squamata*, Quart. Journ. Micr. Sci. vol. xxviii. pp. 303–317.
1889. Report on the Comatulæ of the Mergui Archipelago, etc., Journ. Linn. Soc. London (Zool.), vol. xxi. pp. 304–316, pls. xxvi. and xxvii.
1890. Preliminary Report on the Crinoidea obtained in the Port Phillip Biological Survey, Proc. Roy. Soc. Victoria, new series, vol. ii. pp. 135–136.
1890. On certain points in the Anatomical Nomenclature of Echinoderms, Ann. Mag. Nat. Hist. ser. 6, vol. vi. pp. 1–23.
1891. Some publications on American Carboniferous Echinoderms, Ann. Mag. Nat. Hist. ser. 6, vol. viii. pp. 94–100.
1891. On certain points in the Morphology of the Cystidea, Journ. Linn. Soc. London (Zool.), vol. xxiv. pp. 1–52, pl. i. Abstract in Rep. Brit. Assoc. for 1890, p. 821; and in GEOL. MAG. Dec. III. Vol. VIII. p. 135, March, 1891.
1891. Notes on some Arctic Comatulæ, Journ. Linn. Soc. London (Zool.), vol. xxiv. pp. 53–63, pl. ii.
1891. Notes on some Crinoids from the Neighbourhood of Madeira, *op. et tom. cit.* pp. 64–69.

Dr. Carpenter also contributed an admirable popular account of the Echinoderms to Cassell's Natural History (1883), and was largely responsible for the section on the same group in Nicholson and Lydekker's Palæontology (1889). F. A. B.

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HENRY NOTTIDGE MOSELEY, LL.D., F.R.S., who, after a protracted illness, died on the 10th of November last, at the age of 46, was well known as a "Challenger" Naturalist, and as Linacre Professor of Comparative Anatomy at Oxford. That part of his published work of most interest to the palæontologist related to the Hydrocorallinæ, Alcyonaria and Madreporaria. But throughout his work, especially in his capacity as teacher, he was always alive to the value of fossils, and lost no opportunity of impressing on his pupils the importance