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AN UNCROWNED KING IN SCIENCE.

IN MEMORIAM.

THOMAS HENRY HUXLEY, P.C., D.C.L. (OXON),
LL.D. (CANTAB, EDIN., ET DUBL.), M.D. (WÜRZB.), PH.D. (BRESLAU),
F.R.C.S., F.R.S., F.L.S., F.G.S., F.Z.S., TRUSTEE BRIT. MUS., ETC.

BORN MAY 4TH, 1825.

DIED JUNE 29TH, 1895.

(With a Portrait.)

By the death of Professor Huxley another illustrious name must now be inscribed on the walls of our Valhalla, while the world of science mourns the loss of one of its most distinguished leaders, who shares with Owen and Darwin the reputation of having done more to advance the study of biology than any other of the naturalists who have appeared within the present century.

Though he won his grandest triumphs as a zoologist, there were not many departments of Natural History which he did not cultivate; indeed, it has been truly said of him, by Haeckel, that he was one of the few investigators who had thoroughly mastered the whole range of biology, and might claim to be the first zoologist in this country. Although capable of specializing in any group of animals or plants, he never lost sight of the broader biological problems which are so often overlooked by the less broad-minded systematist, so that he was able to enter the more limited field of classification, and give those who devoted their whole time to any one group a lesson on their own subject. He may well be regarded as our greatest naturalist.

Thomas Henry Huxley was born at Ealing on May 4th, 1825, and was for some years educated at the school in his native place, where his father was one of the masters. This preparatory course was followed by assiduous private reading, including German scientific literature, and instruction in medicine received from a brother-in-law who was a physician. He afterwards attended lectures at the Medical School of the Charing Cross Hospital.

In 1845 he passed the first examination for the degree of M.B. at the University of London, taking honours in physiology. In 1846 he was appointed Assistant-Surgeon to H.M.S. "Victory," for service at Haslar Hospital, and seven months later he was gazetted as

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Dear
Mrs. Mary
M. M. M.

By permission, from a Photograph by Messrs. W. and D. Downey, 57 and 61, Ebury Street, S.W.

Assistant-Surgeon to H.M.S. "Rattlesnake," under the command of Captain Owen Stanley (brother of the late Dean Stanley), commissioned to survey the intricate passage within the Barrier Reef skirting the eastern shores of Australia, and to explore the sea lying between the northern end of that reef and New Guinea. It was the best apprenticeship to what was eventually to be the work of Huxley's life, the solution of biological problems and the indication of their far-reaching significance.

Two of his warmest friends, Darwin and Hooker, had passed through a like curriculum, the former as Naturalist to the "Beagle" on her voyage round the world in 1831, and the latter as Assistant-Surgeon on board the "Erebus" on her Antarctic expedition in 1839. Eventually the three stood shoulder to shoulder when the battle against the immutability of species was fought.

The voyage lasted from 1847 to 1850, and was the initiation of Huxley's scientific career. Some of the results of the studies in Natural History, for which the cruise afforded facilities, were transmitted to the Linnean and Royal Societies, and were in due course published in their Transactions.

Returning to England in 1850, Mr. Huxley was, in the following year, elected a Fellow of the Royal Society, and in 1852 he was presented with one of the Royal Medals annually awarded by the Society. In 1854 he received the appointment of Professor of Natural History, including Palæontology, in the Royal School of Mines and Curator of the fossil Collections in the Museum of Geology, Jermyn Street; and in the same year that of Fullerian Professor of Physiology and Comparative Anatomy to the University of London.

In 1856 he accompanied his friend Professor Tyndall in his first visit to the glaciers of the Alps, and with him read a joint paper on Glacial Phenomena, published in the *Philosophical Transactions* in 1857. In 1858 he was appointed Croonian Lecturer to the Royal Society, when he took for his subject "The Theory of the Vertebrate Skull." In 1859 his monograph on "The Ocean Hydrozoa, a description of the Calycophoridae and Physophoridae observed during the voyage of H.M.S. 'Rattlesnake,'" was published by the Ray Society. In 1860 Prof. Huxley delivered a course of lectures to working-men, in Jermyn Street, on "The Relation of Man to the Lower Animals." The questions arising out of this topic became the subject of warm controversy at the meeting of the British Association at Oxford between Bishop Wilberforce and Professor Huxley, and was taken up by others in that and subsequent years. The whole discussion appeared in the work entitled "Evidence of Man's place in Nature" (1863), and excited great popular interest both in this country and abroad. Mr. Darwin's views on the origin of species formed Professor Huxley's subject for his lectures to working-men in 1862, subsequently published under the title, "On our knowledge of the Causes of the Phenomena of Organic Nature." His other lectures were on the "Elements of Comparative Anatomy" and on the "Classification of Animals and the Vertebrate Skull."

In 1862, while serving as one of the Secretaries of the Geological Society, he was called upon, in the absence of Mr. Leonard Horner, the President, to deliver the Annual Address. Again, in 1869 and 1870, whilst filling the Presidential Chair of that Society, he delivered two other addresses. That in 1862 dealt with the subject of *Homotaxis* as opposed to the use of the term *synchronism*; in 1869 with the limitation of geological time; in 1870 with the evolution of the vertebrata and their geographical distribution. He presided over Section D at the meeting of the British Association at Cambridge (1862), and as President of the Association at Liverpool in 1870, delivering appropriate addresses on both occasions.

From 1863–70 he held the office of Hunterian Professor of Comparative Anatomy in the Royal College of Surgeons, and in 1869–70 was President of the Ethnological Society. He filled the office of Secretary to the Royal Society for ten years, 1871–80, and of President from 1883 to 1885. In 1883 he was appointed Rede Lecturer at Cambridge.

During the absence of Prof. Wyville Thomson on the "Challenger" Expedition, he divided with Dr. Carus, of Leipzig, the duty of acting as his substitute, delivering the lectures in the summer sessions of 1875 and 1876 at the University of Edinburgh. In 1876 Prof. Huxley visited America, when he delivered an Address at the opening of the Johns Hopkins University at Baltimore, on September 12th, and three lectures in New York, on September 18, 20, and 22, before crowded audiences. In the same year Huxley received the Wollaston Medal from the Geological Society of London.

He was elected a member of the London School Board in 1870, and took a leading part in opposing denominational teaching; but was compelled by ill-health to retire from the Board in January, 1872. In December, 1872, he was elected Lord Rector of Aberdeen University for three years, and installed February 27th, 1874. He was a Fellow and Governor for some years of Eton College. He was an elected Trustee of the British Museum, and a member of the Senate of the University of London. He served on many Government and Royal Commissions, notably on Science, on Fisheries, on Contagious Diseases, on Vivisection, on the Scottish Universities, etc. From 1881 to 1885 he held the office of Inspector of Salmon Fisheries. The only post he continued to hold up to the time of his death was that of Dean and Honorary Professor of Biology in the Royal College of Science, South Kensington.

In 1892 he was admitted a member of the Privy Council, having previously refused the honour of knighthood.

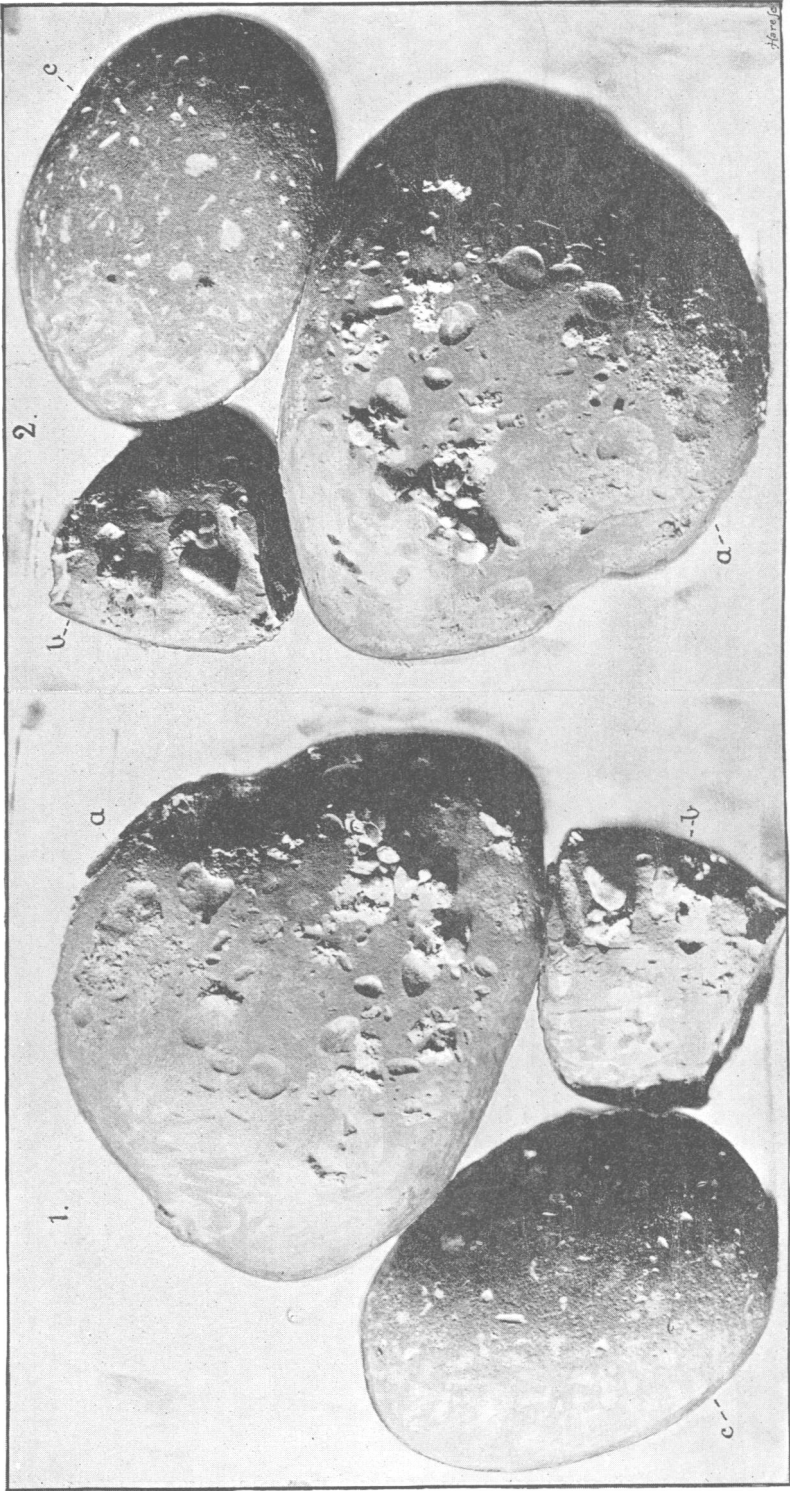
It is impossible to enumerate here the many honours conferred upon Professor Huxley. He was made a Doctor of the Universities of Edinburgh, Dublin, Cambridge, Oxford, Breslau, and Würzburg. The Academies of Brussels, Stockholm, Copenhagen, Cairo, Berlin, Göttingen, Haarlem, St. Petersburg, Lisbon, Rome, Munich, Philadelphia, and many others, conferred on him their Diplomas. He was made an Honorary Fellow of the Royal Society of Edinburgh;

a Member of the Royal Irish Academy; of the American Academy of Science; and (in 1879) a Corresponding Member of the Institute of France (Section Anatomy and Zoology, in place of Von Baer). He was also a Riddare of the Pole Star of Sweden.

Turning to his published works, we may refer to his "Oceanic Hydrozoa"; his Lectures on Comparative Anatomy and Physiology; Lessons in Elementary Physiology (1866), and many subsequent editions; An Introduction to the Classification of Animals (1869); "Lay Sermons, Addresses, and Reviews" (1870). His textbooks on the Anatomy (I) of the Vertebrata (1871), and (II) of the Invertebrata; his Practical Biology; "Man's Place in Nature"; on the Cray-fish, and on Physiography, well illustrate the wide extent and versatility of his powers, both as a naturalist and author; but it was by his lectures and addresses that he displayed the most marvellous of his intellectual gifts, and produced the greatest effect upon the science of his time. He had that wonderful power of carrying his audience along with him, and the happy facility of bringing his knowledge within the mental grasp of his hearers.

Of the 144 papers attributed to Prof. Huxley in the Royal Society's list of scientific papers extending from 1847 to 1884, the following may be mentioned as directly connected with our own science:—

On the Method of Palæontology (Annals, 1856). *Pygocephalus Cooperi*, a Coal-measure Crustacean (Q.J.G.S. 1857). On the genus *Pteraspis* (Brit. Assoc. Rep. 1858); On *Cephalaspis* and *Pteraspis* (Q.J.G.S. 1858); On *Plesiosaurus Etheridgei* (Q.J.G.S. 1858). On Persistent Types of Animal Life (Roy. Inst. Proc. 1858-62). On Species and Races and their Origin (Roy. Inst. Proc. 1860). On *Stagonolepis Robertsoni* (Q.J.G.S. 1859); On some Amphibian and Reptilian Remains from South Africa and Australia (Q.J.G.S. 1859); On *Dicynodon Murrayi*, South Africa, and on Skulls of Dicynodonts (Q.J.G.S. 1859); On *Rhamphorhynchus Bucklandi*, a Pterosaurian from Stonesfield (Q.J.G.S. 1859); On a Fossil Bird and a Fossil Cetacean from New Zealand (Q.J.G.S. 1859); On Dermal Armour of *Crocodylus Hastingsiæ* (Q.J.G.S. 1859); On the Anatomy of *Pterygotus* (Geol. Surv. Mem. 1859); On *Dasyceps Bucklandi* (Geol. Surv. Mem. 1859); On the Lower Jaw of a Labyrinthodont (Geol. Surv. Mem. 1859). On *Macrauchenia Boliviansis* (Q.J.G.S. 1861); On *Pteraspis Dumensis* (Q.J.G.S. 1861); Systematic Arrangement of Devonian Fishes (Geol. Surv. Mem. 1861). New Labyrinthodonts from Edinburgh Coal-field (Q.J.G.S. 1862); On a Stalk-eyed Crustacean from Coal-measures, Paisley (Q.J.G.S. 1862); On the Premolar Teeth of *Diprotodon* (Q.J.G.S. 1862). On a New Species of *Glyptodon* (Roy. Soc. Proc. 1862-63). *Anthracosaurus Russellii*, Coal-field Lanark (Q.J.G.S. 1863). On Cetacean Fossils termed "Ziphius," Cuvier, from the Red Crag (Q.J.G.S. 1864). Osteology of *Glyptodon* (Phil. Trans. 1865). Vertebrate Remains from Jarrow Colliery, Kilkenny, Ireland (GEOL. MAG. 1866). Dinosaurian Reptiles from South Africa (Q.J.G.S. 1867); On *Acanthopholis horridus*, a new Reptile from the Chalk Marl (GEOL. MAG. 1867); New specimen of *Telrpeton Elginense* (Q.J.G.S. 1867). Animals intermediate between Birds and Reptiles (GEOL. MAG. 1868); Two new Fossil Lacertilians from South Africa (GEOL. MAG. 1868, pp. 201-205); On *Archæopteryx lithographica* (Roy. Soc. Proc. 1868). On *Hyperodapedon* (Q.J.G.S. 1869); On a new Labyrinthodont, *Pholiderpeton scutigerum*, from Bradford (Q.J.G.S. 1869); On the Upper Jaw of *Megalosaurus* (Q.J.G.S. 1869); Principles and Methods of Palæontology (Smithsonian Reports, 1869). The Milk-dentition of *Paleotherium magnum* (GEOL. MAG. 1870); On *Hypsilophodon Foxii*, a new Dinosaurian from the Wealden, Isle of Wight (Q.J.G.S. 1870); Further evidence of the Affinity between the Dinosaurian Reptiles and Birds (Q.J.G.S. 1870); On the Classification of the Dinosauria, with Observations on the Dinosauria of the Trias (Q.J.G.S. 1870); Triassic Dinosauria (*Nature*, 1870, p. 23); On the Maxilla of *Megalosaurus* (Phil. Mag. 1870). (With Dr. E. P. Wright) On the Fossil Vertebrata from the Jarrow Colliery,



Pitted Pebbles from the Bunter Conglomerate, Cannock Chase.

Kilkenny, Ireland (Irish Acad. Trans. 1871). On *Stagonolepis Robertsoni*, etc. (Q.J.G.S. 1875). On the evidence as to the Origin of existing Vertebrate Animals (lectures, *Nature*, 1876). The Rise and Progress of Palæontology (*Nature*, No. 24, 1881). The Coming-of-age of the "Origin of Species" (1880, Roy. Inst. Proc. 9, 1882).—It will be seen that Professor Huxley was a frequent contributor to the pages of the GEOLOGICAL MAGAZINE, and was one of its constant supporters since its commencement in 1864.

His last paper to the Geological Society was "Further Observations upon *Hyperodapedon Gordoni*," read May 11, 1887: see Q.J.G.S., vol. xliii, p. 675, pls. xxvi and xxvii. His latest work (published in conjunction with Dr. Pelsener) is on *Spirula* ("Challenger" Reports), 1895.

"Four kings laboured to build a mighty hall, the Hall of a Hundred Columns, at Karnak. In a century they built it, and they died; but the hall remains. Four men [Darwin, Tyndall, Huxley, Spencer], more than all others, have raised up within this century an edifice which is the crowning glory of British science; and before the century closes three of them are dead. But the edifice stands, and will stand, as a lasting monument to the power of truth and fearless investigation."—*Pall Mall Gazette*.

For further details see also "Men and Women of the Time," *The Times*, *Athenæum*, *The Standard*, *Daily Chronicle*, *Daily News*, etc., July 1st. H. W.

ORIGINAL ARTICLES.

I.—PITTED PEBBLES IN THE BUNTER CONGLOMERATE OF CANNOCK CHASE.

By T. MELLARD READE, C.E., F.G.S., F.R.I.B.A.

(PLATE XI.)

IN a letter to this MAGAZINE of May, 1895, headed "The Indentation of the Bunter Pebbles," Mr. W. S. Gresley criticizes the summing-up of my views, given in the 'Annals of British Geology' (1892, p. 52), that "The indentation of the pebbles he considers to be the result of contact-solution, the water being retained at these spots by capillary attraction." It would have been more satisfactory if Mr. Gresley could have read my original paper¹ before penning his letter, as he would then not have assumed that I "adduce no evidence in support of the chemical theory."

Perhaps I may be permitted in the pages of this Journal to re-state, and if necessary expand, my reasons for thinking that the "indentations" were not mechanically impressed, as the term rather assumes, but were simply due to solution at the points of contact. In the absence of specimens of the pebbles themselves, to thoroughly understand the question a good photograph is required, and this I have endeavoured to supply, so that my statements can be literally followed.

These are my points—

First.—If the pittings or depressions were due to mechanical pressure, the material of the pebble which was "indented" would

¹ The Trias of Cannock Chase, Proc. Liverpool Geol. Soc., Session 1891-2.