

An interval of leisure then followed, during which Captain Wharton published "Hydrographical Surveying." He expresses himself with characteristic modesty in the preface, but it was at once universally recognised as the standard work on the subject, and has continued to be so considered to the present time, being used both in our own and in foreign navies.

In March, 1882, he commissioned H.M.S. *Sylvia* for surveying service in the River Plate and Straits of Magellan. It was already an open secret that he was destined to succeed Captain Sir Fred. Evans as Hydrographer to the Admiralty when that officer should retire. In December, 1882, he successfully observed the transit of Venus for the second time. The anxieties of two seasons in the inhospitable climate and dangerous waters of the western part of the Straits of Magellan told upon Wharton considerably, and at this time he aged much in appearance. But, full of energy as ever, the work was pushed on rapidly in spite of the hardships and difficulties that had to be encountered, with the result that the survey was completed within the allotted time, and on returning to Montevideo in March, 1884, he left the ship and proceeded to England by mail steamer to assume the duties of hydrographer, being appointed as such on August 1, 1884, at an age younger than that of any officer who had held that responsible position. This closed his career afloat.

Wharton's administration of the hydrographic department of the Admiralty continued uninterruptedly for twenty years with constantly increasing credit, and to the great advantage of our own Navy as well as to the whole maritime world. This period covered the enormous expansion that took place both in the *personnel* and *materiel* of the fleet, causing corresponding accessions to the labour of departmental work; during the same period the number of chart plates was largely increased, and the number of charts printed annually for the fleet and for sale to the public multiplied three-fold.

Gifted with an extraordinary capacity for work, he never spared himself; the sound judgment, breadth of view, and wide scientific attainments constantly brought to bear upon the infinite variety of subjects with which he was daily called upon to deal secured for him the respect and confidence of successive Boards of Admiralty. An especial characteristic was the readiness with which the mass of information he had acquired on all sorts of subjects was available on the spur of the moment. As *ex-officio* member of the Meteorological Council, he attended its meetings assiduously and rendered valuable service to the advancement of ocean meteorology.

His personal interest in the surveying service was unceasingly manifested in the voluminous semi-official correspondence he maintained with the officers in command of surveys. Scientific subjects of whatever nature bearing on hydrography always claimed his attention, and in 1886 he was elected a Fellow of the Royal Society, serving on its council from 1888 to 1889, again from 1895 to 1897, and being again elected in 1904 was a member until his death.

As Fellow of the Royal Astronomical Society, as well as of the Royal Geographical Society, as vice-president of the latter and member of numerous committees, he did work only less important than his official work at the Admiralty. His first contribution to the literature of the Royal Society was the investigation of the great waves produced by the eruptions of Krakatoa in 1882, which had been begun by the late Sir Frederick Evans and left unfinished at his death. In 1893 he edited the journal of Captain Cook during his first voyage round the world; at the meeting of the British Association at Oxford in 1894 he presided over

Section E. Various contributions to NATURE appeared from time to time from his pen, the investigation of the origin and formation of coral reefs being a subject of especial interest to him. He advanced a theory, based upon the results of surveys of large numbers of these reefs, that the effect of wave action was mainly accountable for the striking uniformity of depth so frequently met with over the interior of coral banks in the open ocean, showing that wave action in open oceans extended to greater depths than was hitherto considered possible.

As a member of the coral reef committee of the Royal Society, he was largely responsible for the selection of Funafuti as the atoll to be investigated by sounding and boring operations, and he was instrumental in securing the cooperation of the Admiralty in the work, which has produced such valuable results.

He was keenly interested in the project for Antarctic exploration, but more particularly in its bearing upon terrestrial magnetism, and he took a very active part as a member of the joint committee of the Royal and Royal Geographical Societies appointed to organise it.

He was placed on the retired list in 1891, in accordance with the regulation respecting non-service at sea. Promoted to Rear-Admiral on January 1, 1895, on the Queen's birthday that year he was nominated as C.B. On the occasion of the Diamond Jubilee in 1897 he was created K.C.B.

On July 31, 1904, Sir William Wharton resigned the office of hydrographer. For some years previously he had suffered much inconvenience and pain owing to an injury to his right wrist received whilst serving in the *Shearwater*; for this and other causes he determined to relinquish the appointment. In July last, after a visit to Aix-les-Bains, he accepted with some hesitation the reiterated invitation to go out to South Africa with a party of members of the British Association, and he presided over Section E at Cape Town. Unfortunately he fell ill on the return journey from the Victoria Falls, and could not return to England as he intended, with his friends, in the *Armada Castle*. His illness, which was at first thought to be a chill, proved to be enteric fever complicated with pneumonia, and although no effort was spared to effect his recovery he died at the observatory at Cape Town on September 29, where he was the guest of his old and valued friends Sir David and Lady Gill. He was buried at the Naval Cemetery at Simon's Town on October 1 with full naval honours, H.M. the King being represented by the Commander-in-Chief of the station. He was married, in 1880, to Lucy Georgina, daughter of Mr. Edward Holland, of Dumbledon, in Gloucestershire, and by her, who survives him, he had two daughters and three sons, two of whom are now serving in H.M. Navy.

A. M. F.

GEORGE BOWDLER BUCKTON, F.R.S.

ONE of the most energetic and laborious, as well as one of the oldest of our British entomologists, Mr. George Bowdler Buckton, died on September 25 in his eighty-eighth year. Although he was always interested in natural history, it is somewhat remarkable that, while many men take up the study of entomology in early life and abandon it later, all his important entomological work was executed late in life, and was carried on until a very short period before his death.

Mr. Buckton was born at Hornsey on May 24, 1818. He was privately educated, being debarred from entering a public school by an accident in boyhood which crippled him for life.

Mr. Buckton dedicated his first book, "British Aphides," to Thomas Bell, "a friend of more than forty years' standing" (in 1876), whose sympathy and encouragement had given him a taste for natural history. During the earlier part of his life Mr. Buckton resided in or near London, when his attention was given more to physical than to natural science; and he served as assistant to Prof. A. W. Hofmann at the Royal College of Chemistry. From 1845 to 1865 he published several important papers on chemical subjects (a list of which will be found in the Royal Society's Catalogue of Papers) in the *Journal of the Chemical Society*, the *Proceedings of the Royal Society*, and elsewhere; and his earliest published paper on any entomological subject appears to have been "On the Application of Cyanide of Potassium to killing Insects for the Cabinet," published in the *Zoologist* for 1854, cyanide compounds having been one of his favourite studies during his chemical researches. In the following year (1855) he published a short paper on bats in the second volume of the *Proceedings of the Linnean Society*.

He was a Fellow of the Linnean Society (1845), the Chemical Society (1852), the Royal Society (1857), and the Entomological Society (1883), and was also a member of the Entomological Society of France, a corresponding member of the Royal Academy of Sciences of Philadelphia, &c. He took great interest in these societies, attending their meetings as far as he was able, and occasionally serving on their councils; he also travelled in Italy, France, and other Continental countries, as well as in the British Islands.

In 1865 Mr. Buckton published one of the last of his chemical papers, in conjunction with Prof. W. Odling, whose daughter, Mary Ann, he married in the same year. He then settled at Haslemere, Surrey, for the remainder of his life, where he had purchased the estate at Weycombe, and built himself a house after his own design, with an observatory.

From the time of his residence at Haslemere, Mr. Buckton devoted much of his time to entomology. He formed a collection of Lepidoptera, but paid more attention to the British Homoptera, being much assisted by his children, whom he brought up in the same tastes as his own. He wrote comparatively little in the entomological journals, but published a series of very important entomological monographs from 1876 to 1905, chiefly relating to the somewhat neglected order Homoptera, which will not soon be superseded. They may here be enumerated:—1876–1883, "Monograph of British Aphides" (Ray Society), 4 vols., comprising upwards of 750 pages of letterpress, 9 plain and 134 coloured plates; 1890–1891, "Monograph of British Cicadæ or Tettigidæ" (Macmillan), 2 vols., comprising 426 pages of letterpress, 7 plain and 75 coloured plates; 1895, "The Natural History of *Eristalis Tenax*, or the Drone-Fly" (Macmillan), 1 vol., pp. vii+88, with 1 coloured and 8 plain plates. This work is illustrative of the story of Samson and the Bees. 1901–1903, "A Monograph of the Membracidæ" (Lovell Reeve), 6 parts, comprising upwards of 300 pages of letterpress, and 1 plain and 60 coloured plates. Mr. Buckton's last publication was a supplementary paper to this work, comprising 10 pages of letterpress and 2 coloured plates, forming vol. xi., part ix., of the *Transactions of the Linnean Society*, second series, zoology, and dated July, 1905.

The illustrations to Mr. Buckton's works were all drawn, and the pattern plates coloured, by himself. Some of his plates were even lithographed by himself, and most, if not all, of those which were hand-coloured were coloured by himself or his daughters.

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The original drawings for the work on Membracidæ have been presented to the Hope Museum at Oxford.

Mr. Buckton kept his genial force and vitality to the end; "his eye was not dimmed, nor his natural force abated." His last illness was of brief duration, and the end was very calm and peaceful. His ashes, after cremation, were deposited in a grave lined with ivy leaves in Haslemere Churchyard on Saturday, September 30.

W. F. KIRBY.

NOTES.

WE regret to see the announcement that Ferdinand Baron von Richthofen, professor of geography in the University of Berlin, died on October 7 in his seventy-third year.

THE sixth annual Huxley memorial lecture of the Anthropological Institute will be delivered on Tuesday, October 31, in the rooms of the Society of Arts, by Dr. John Beddoe, F.R.S., the subject being "Colour and Race."

A JOINT meeting of the Royal Society and the Royal Astronomical Society will be held in the rooms of the Royal Society on Thursday next, October 19, at 4.30 o'clock, to receive preliminary reports on the observations of the recent solar eclipse. It is expected that reports will be presented by the Astronomer Royal, Prof. H. L. Callendar, Mr. J. Evershed, Mr. H. F. Newall, Prof. H. H. Turner, and others.

THE annual "fungus foray" of the Essex Field Club will be held at High Beach, Epping Forest, on Saturday next, October 14; referee, Mr. George Masee, of Kew Museum. Any botanists wishing to attend should communicate with the hon. secretaries of the club, Buckhurst Hill, Essex.

THE death is announced of the Rev. S. J. Johnson at his residence, Melplash Vicarage, near Bridport, on October 9. Mr. Johnson was well known in astronomical circles for his writings upon eclipses and other astronomical matters. He was a Fellow of the Royal Astronomical Society for more than thirty-three years.

SIR EDWARD H. CARBUTT, the eminent mechanical engineer, died suddenly at his residence near Guildford on October 8 at the age of sixty-eight years. He was a past-president of the Institution of Mechanical Engineers, and a vice-president of the Iron and Steel Institute. He was an active member of the board of the National Physical Laboratory, and represented the Iron and Steel Institute on the departmental committee on the Royal College of Science and Royal School of Mines. He also represented the Iron and Steel Institute on the Institution of Civil Engineers' committee to formulate a scheme of education for engineers.

THE Municipal Museum at Hull recently acquired a valuable addition to its collection of local Roman and other remains. The specimens are principally of Roman date, and include more than 2000 coins, nearly 100 fibulæ of a great variety of patterns, several dozen buckles, pins, dress fasteners, ornaments, strap ends, bosses, spindle whorls, armlets, spoons, beads, and other objects. Among the fibulæ are two of exceptional interest, as they bear the maker's name upon them (Avcissa). There is also an extensive collection of pottery, including many vases, strainers, dishes, &c., in grey ware, as well as many fine pieces of Samian ware, several of which contain the potters' marks.