

neurological research and "trusting mainly to the old methods of the comparative anatomist" he gave an accurate account of the lateral sense organs and their nerve supply and of the macroscopic anatomy of the cranial nerves of *Laemargus* and, with J. C. Mitchell, of *Raia*. He had further preparations made for continuing his work on the cranial nerves, but was diverted by his interests in the development of the limbs of the horse. He showed in 1894 that in foetal horses a digit composed of three phalanges was borne on the distal end of each of the splint bones which represent the metacarpals and metatarsals of the second and fourth digits, but that about the time of birth the phalangeal joints disappear, the phalanges become ossified and, early in the second year, fuse with their respective splints forming the "buttons". This was an important and interesting contribution in view of the reduction of these digits known to have occurred in the evolution of the limbs of the horse.

About 1895 Ewart began his work in animal breeding. It is to be remembered that Mendel's laws were not rediscovered until 1900, but Ewart devised careful experiments to throw light on some of the problems of cross breeding and inbreeding, on reversion and on telegony. The best known of these investigations were those in which mares of various breeds were crossed with a Burchell's zebra stallion. Ewart thoroughly studied the hybrids and presented the results, together with those of many other breeding experiments in a volume, "The Pencyuik Experiments" (1899), which attracted much attention. The zebra hybrids formed an interesting exhibit at the Royal Agricultural Society's Show in York in 1900. His investigations to test the theory of telegony—that a sire may 'infect' the dam served by him and leave his mark on her subsequent offspring by other sires—led him to a negative result, and he showed that the appearances described could be explained as examples of reversion.

Several papers followed on different subspecies of horses, and on the origin and evolution of horses and ponies, and Ewart described (1906) the animal remains, more particularly of a considerable number of horses, found in the Roman fort at Newstead near Melrose. Papers on domestic sheep and their wild ancestors marked a further development of Ewart's work, and the renting from 1913 until 1921 by the University of Edinburgh of a farm at Fairsacks enabled him to conduct investigations for the improvement of the fleece of sheep, which brought him into contact with the woollen industry in Scotland; he also became an active member of the Council of the Wool Industries Research Association in Leeds. Ewart's expert knowledge was the chief factor which decided the Board of Agriculture for Scotland to constitute in Edinburgh in 1913 a committee on animal breeding. This committee was suspended during the War but was re-established in 1919 and in 1920 appointed Dr. (now Prof.) F. A. E. Crew as director of research, under whom the work in

genetics and animal breeding has developed into a separate Department of the University.

The rearing of penguins in the Zoological Park in Edinburgh afforded Ewart the opportunity to study the sequence and the structure of the different types of feathers. In a paper in 1921 he discussed the origin and history of feathers, and he continued until about two years ago to devote attention to the relationship of feathers and scales.

Ewart had skilful hands and could make a good dissection and admirable drawings; early examples of his drawings are to be found in the plates of Turner's lectures on the placenta (1876). He was elected F.R.S. in 1893, was awarded the Neill Medal and Prize of the Royal Society of Edinburgh in 1898 in recognition of his investigations on telegony, and in 1928 received the honorary degree of LL.D. from his old University. He retired from his chair in 1927 and died in Pencyuik on December 31, 1933. He is survived by his widow, a married daughter and a son, who is a surgeon in London. J. H. A.

DR. F. H. H. GUILLEMARD

FRANCIS HENRY HILL GUILLEMARD, whose death occurred on December 23, was born at Eltham in 1852. Travel and natural history made a strong appeal to him from boyhood onwards. At an early age he announced his intention of becoming a traveller and a doctor, and his first published work was an article on "Pigeons" in the *Boys' Weekly* in 1866. Destined for Rugby, he was kept at home between 1866 and 1868 owing to ill-health and afterwards went to a 'crammer' at Richmond. By this time he had become an habitu  of Stevens' rooms in King Street, Covent Garden, never missing a natural history sale if he could help it and seeing there the great ornithologists of the day—Newton, Lilford, Howard Saunders and others. In 1870 he went up to Gonville and Caius College, Cambridge, where he read medicine under Humphry and Paget.

As an undergraduate, Guillemard made two journeys to the Orkneys, chiefly for bird study, which was one of the ruling passions of his life, and immediately after he had taken his degree he made a more ambitious trip to Lapland. At St. Bartholomew's Hospital he was clinical clerk to Patrick Black at the time when Robert Bridges was house physician.

Taking his M.B. degree in 1876, Guillemard entertained no thoughts of medical practice. Travel was his objective, and in 1877 he had the opportunity of exploring some little-known parts of Africa, trekking across the Transvaal and the Orange Free State in the old bullock-wagon manner and visiting the diamond fields in their early days. His articles on the ornithology of South Africa were published in the *Field* in 1880 and 1881, and the journey also provided the subject for his M.D. thesis, "On the Endemic

Hæmaturia of Hot Climates caused by the Presence of *Bilharzia Hæmatobia*", which was published in 1882. Guillemard's most famous journey was begun in 1881 when the *Marchesa* (schooner yacht of 420 tons, Mr. C. T. Kettlewell captain and owner) was commissioned. The *Marchesa* reached Colombo in April 1882; from there she sailed to Singapore, Formosa, the Liu-kiu Islands, Japan, Kamschatka, the Sulu Archipelago, North Borneo and New Guinea. From the Malay and Papuan regions the *Marchesa* brought home a large collection of natural history objects, most of them obtained in the large islands of north-west New Guinea. In particular, Guillemard was a passionate enthusiast for the birds of paradise, of which seventeen different species were found. The whole collection of birds, numbering about 3,000 specimens, was described by Guillemard in the *Proceedings of the Zoological Society* of 1885, and on his return to England he settled in Cambridge with the view of writing a complete account of his journey. "The Cruise of the *Marchesa*" was published in 1886 and was hailed as one of the best travel books in many years; such passages as that describing the first view of the Kamschatka group of volcanoes have made a permanent place for themselves in the literature of travel.

Guillemard became a member of the British Ornithological Union in 1885 and, at the suggestion of Lord Lilford, went to Cyprus to make a study of the ornithology of the island. Returning to Cambridge, he was the first holder of the lectureship in geography in the University, but owing

to ill-health resigned the post almost immediately. A few years later, Guillemard settled at the Old Mill House at Trumpington, and there he lived until his death. Though he held no official post in the University, he was one of its best known figures: he was the general editor of the Cambridge Geographical Series and of the Cambridge County Geographies published by the University Press; he wrote the life of Magellan and the volume on Malaysia and the Pacific Archipelago in Stanford's "Compendium of Geography"; he was active on the Botanic Garden and Fitzwilliam Museum Syndicates. Above all, he had a wide circle of friends from whom he won affection as well as admiration. With the passing of Henry Guillemard, Cambridge loses something that was exquisite and unique.

WE regret to announce the following deaths:

Dr. D. H. Scott, F.R.S., honorary keeper of the Jodrell Laboratory at Kew in 1892-1906 and foreign secretary of the Royal Society in 1912-16, a leading authority on palæobotany, on January 29, aged seventy-nine years.

Dr. Henry S. Washington, petrologist in the Carnegie Institution of Washington since 1912, an authority on the composition and classification of rocks, especially igneous rocks, on January 7, aged sixty-seven years.

Mr. Edgar Worthington, formerly secretary of the Institution of Mechanical Engineers, on January 23, aged seventy-seven years.

News and Views

Micro-ray Radio Link across the English Channel

ANOTHER milestone in the history of practical radio communication was reached on Friday, January 26, when Sir Philip Sassoon, Under-Secretary of State for Air, officially opened the world's first commercial 'micro-ray' radio service on a wave-length of 17 cm. between the civil airports at Lympne, Kent, and St. Inglevert, France. M. Delesalle, Under-Secretary of State for Air in France, was present at St. Inglevert, and messages of greeting were exchanged, both by teleprinter and by telephone. The inauguration of this service is the outcome of a demonstration given in March 1931 by Messrs. Standard Telephones and Cables, Ltd., who secured the contract for the Lympne installation from the Air Ministry. The corresponding station in France was erected by the associated company—Le Matériel Téléphonique, of Paris. The actual wave-lengths employed in this radio link are 17 cm. in one direction and 17.5 cm. in the opposite direction, and this separation enables duplex working to take place simultaneously by teleprinter and telephone. The teleprinter has been used on land-line commercial telegraph services for some years, and its application to radio communication on this occasion will

enable messages to be sent and recorded at a speed of 60-70 words per minute.

THE power generated at each transmitting station of new cross-Channel radio link is less than one watt, a special valve being employed to produce the requisite high-frequency oscillations, which are fed into an aerial about one inch long. This aerial is situated at the focus of a small concave reflector which directs the waves on to a second reflector approximately 10 feet in diameter. The concentrated beam emanating from this arrangement is directed to the similar reflector system used for reception at the distant station. At the Lympne aerodrome, the aerial and reflectors are erected on the roof of a hangar, and are so placed as to command an optically clear path of the corresponding equipment installed on steel towers at St. Inglevert, 35 miles away. Duplicate aerial and reflector systems are employed for transmission and reception. Special feeder lines are led down to the transmitting and receiving apparatus installed in the buildings below. This apparatus provides for the use of telegraphy and telephony in addition to the normal service to be carried on by means of Creed teleprinters. The