Obituary.

MR. M. R. OLDFIELD THOMAS, F.R.S.

MICHAEL ROGERS OLDFIELD THOMAS, who died in tragic circumstances on June 16 last at the age of seventy-one years, was from boyhood devoted to the study of natural history. In 1876, at the age of eighteen, he was appointed to a clerical post in the British Museum. During the two succeeding years he devoted his leisure to biological studies under Huxley at the Royal College of Science and soon proved himself to be an alert observer with most capable hands. His beautiful dissections, and the ease and speed with which he made them, soon won the admiration of his teachers; and their reports persuaded Dr. Günther, the Keeper of Zoology, to arrange for the transfer of Thomas from the clerical to the scientific staff of the Museum. Thomas used to tell an amusing story of that transfer. For some months he was aware that it was going to take place; and rumour told him that he would work in future at echinoderms. Accordingly he took up the study of echinoderms with enthusiasm. At last the great day dawned. Dr. Günther sent for him and said: "Thomas, you will do the mammals." Poor Thomas murmured something about echinoderms, but the autocrat thundered: "You *will* do the mammals." Visions of countless sheep and cattle rushed into the lad's mind and, as Thomas put it, he hated those animals from a systematic point of view for ever more.

Günther never made a wiser decision as it turned out. He was himself greatly interested in the Mammalia, and he thought that the keen, sharp-sighted boy would be just the person to help him to continue the solid contributions he was making to systematic literature on Mammalia. But the skirts of a great keeper's cloak were not ample enough to conceal for long the enthusiastic and ambitious Thomas. Günther had intended to write the Museum Catalogue of Marsupialia and Monotremata himself; but Thomas made so many discoveries and worked with such energy and painstaking thoroughness that Günther willingly relinquished the task to him. In 1888 the Catalogue was published, and it remains to this day the solid foundation of all modern systematic work on the group.

Two events which profoundly influenced Thomas's subsequent career happened in or about 1890. Before that time mammal collections consisted chiefly of spirit specimens and of specimens stuffed with their skulls inside. The Biological Survey of the United States Department of Agriculture had just been established under the leadership of Dr. C. Hart Merriam, and the first reports under the serial title "North American Fauna" were just beginning to appear. Attracted by these, Thomas found that Merriam was working with long series of carefully prepared dried skins, each skin accompanied by its own cleaned skull. Correspondence followed and Thomas decided to give the new methods a trial. In the course of the next few years he perfected them. Leaving North America in the competent hands of the Americans, Thomas resolved that the British Museum should attempt a survey of the mammals of the rest of the world—a big task for one institution with limited means and for one rather frail man to undertake.

After his marriage to Mary Kane, daughter of Sir Andrew Clark, in 1890, Thomas was in possession of considerable means. His wife, interested in natural history herself and devoted to all that concerned her husband, readily agreed to the use of as much as could be spared from their joint purse for the purpose of financing collectors of mammals in various parts of the world. They went, too, on collecting trips together into various parts of western Europe and to South America. Quickly Thomas gathered round him a band of volunteer workers in the Museum; and by hard work and perseverance he gained the ears and the purses of many wealthy people who were glad to benefit the national collections and advance the cause of science.

Gifted with an extremely practical mind, Thomas was able to cut out all unessentials; in each problem that came to him for solution he saw at once the point and the shortest way to it. He worked with amazing rapidity, jumping from one matter to another without hesitation or confusion of ideas, and he never forgot anything of importance. A continuous stream of papers flowed from his pen in the *Annals and Magazine of Natural History* from 1880 down to the present year, with many contributions to the *Proceedings of the Zoological Society* and the *Journal of the Bombay Natural History Society*. Meeting that keen naturalist the late R. C. Wroughton in 1909, they developed together the well-known Mammal Survey of India, by which huge collections of Indian mammals have been brought together and worked out, resulting in a vastly extended knowledge of this part of the zoology of India and the adjacent countries.

In all, Thomas described more than 2000 species and defined more than 200 genera of mammals. His papers are models of terse description with nothing superfluous anywhere. Indeed, over and over again he might have said a little more with advantage; but there was always another job waiting to be done and he had said enough for the present purpose. Always busy and somewhat difficult to approach, people who knew him only by his scientific writings regarded Thomas merely as a narrow systematist and a "mere museum naturalist". No greater error was ever made; he was at heart a field naturalist, and on his various journeys made important collections of flies and myriopods in addition to his mammals. But with a big task before him, he deliberately restrained his natural inclinations, saw clearly what he had to do, and lived just long enough to do it. His work has built the unrivalled national collection of mammals and the vast literature relating to it.

In order to accomplish his life's work, Thomas refused to entertain any thought of official promotion. Elected an F.R.S. in 1901, he served on the council of the Royal Society, and for many years

on the council of the Zoological Society of London. After his official retirement from the Museum in 1923, he continued his old work as though nothing had happened. The death of his wife in May 1928 was a severe blow from which he never recovered.

M. A. C. H.

PROF. HENRI ANDOYER.

BY the death on June 12 of Marie Henri Andoyer at the age of sixty-six years, French science has lost a distinguished member of that characteristic school of mathematical astronomers of which such men as Tisserand and Radau were eminent examples and Henri Poincaré the most brilliant ornament. In Andoyer a rare combination of qualities was united. To his knowledge and ability as a mathematician and his acquaintance with the technical side of practical astronomy he joined a skill and a passion for numerical calculation which recalls the kindred taste of J. C. Adams in England. He was at the same time a gifted teacher, with an enthusiasm and critical sense which made his exposition equally attractive in the shape of lectures or in published form.

Andoyer was born at Paris on Oct. 1, 1862, and entered the École Normale Supérieure in 1881, devoting himself to the study of pure mathematics. The years 1885–92 were spent at Toulouse, where Andoyer was attached to the Observatory but more actively engaged as professor in the faculty of science. As astronomer, however, he took part in organising the work of the Astrographic Chart, and attended the early conferences on the scheme at Paris. In 1892, before this work had advanced beyond the preliminary stages at Toulouse, Andoyer was recalled to Paris to deliver a course of lectures on mathematical astronomy and celestial mechanics and to share in the teaching of mathematics in the Faculty of Science. To this period belongs his "Leçons sur la théorie des formes et la géometrie analytique supérieure", together with a number of more elementary text-books and some original papers, all devoted to pure mathematics. It was thus comparatively late in life that his devotion to mathematical astronomy asserted itself as an absorbing study, and even after 1903, when he was appointed professor of astronomy at the Sorbonne, his interests were not always confined in any narrow sense to the subject of his chair. The germ to be seen so early as 1887 in a paper on intermediary orbits, inspired by the work of Gyldèn, was a little slow in bearing fruit.

In 1910, Andoyer succeeded Bouquet de la Grye as a member of the Bureau des Longitudes, and on the death of Radau in the closing days of 1911 followed him as editor of the *Connaissance des Temps*. The annual ephemeris has appeared under his direction from the year 1914 onwards, and has fully maintained the high reputation earned for it under his predecessors.

Two works of permanent value embody the substance of Andoyer's teaching. One, "Cours d'astronomie", comprises a first volume on theoretical astronomy, which reached its third edition in 1923, and a second on practical astronomy, of which the second edition, in collaboration with A. Lambert, appeared in 1924. The other, "Cours de mécanique céleste", in which stress is laid on the computational side of this intricate subject, was published in two volumes (1923 and 1926).

The theory of the moon's motion, after the work of Delaunay and Radau on one hand, and of Hill and E. W. Brown on the other, presents a field offering little scope for easy or striking achievements of a novel kind. But it was to this difficult and in appearance fully explored problem that Andoyer turned repeatedly with complete knowledge of what had been done by others. It is the subject of his last considerable work, "Sur la théorie analytique du mouvement de la lune", the culmination of a series of critical studies in a branch of astronomy for which he was exceptionally qualified by natural gifts.

Andoyer's passion for numerical calculation found scope in the recomputation of fundamental logarithmic and trigonometrical tables. Executed single-handed and with remarkable rapidity, equal evidence of unfailing industry and quite extraordinary skill, these tables were published between 1911 and 1918. It is likely that they will not be superseded by any later work of the same kind, at any rate performed in the same fashion.

Andoyer was elected an associate of the Royal Astronomical Society in 1914 and became a member of the Paris Academy of Sciences in 1919. He was Officier of the Legion of Honour. Of a modest and simple disposition, he will be mourned by a circle of colleagues, and his death removes from the ranks of astronomy a gifted and indefatigable worker not easily replaced.

H. C. P.

WE regret to announce the following deaths:

Mr. W. S. Andrews, at one time associated with Edison in electrical developments and distinguished for his work on fluorescence and phosphorescence and selenium cells, on July 1, aged eighty-one years.

Dr. Charles F. Brush, of Cleveland, Ohio, the inventor of the electric arc light known by his name, on June 15, aged eighty years.

Prof. Wilhelm Ellenberger, formerly rector and director of the physiological and histological institute and of the physiological chemistry research station of the Veterinary Highschool, Dresden.

Lieut.-Colonel George Henderson, formerly of the Indian Medical Service and for a time Director of the Royal Botanical Gardens and professor of botany in the University of Calcutta, on June 24, aged ninety-two years.

Major C. V. Hodgson, hydrographic and geodetic engineer and assistant chief of the division of geodesy, U.S. Coast and Geodetic Survey, who had taken part in many surveying expeditions to the waters of Alaska and the Philippine Islands, and was known chiefly for his work on geodetic astronomy, on May 19, aged forty-nine years.

Mr. G. R. Kaye, formerly of the Indian Education Department, author of some well-known works on Indian astronomy.

M. Léon Lindet, member of the Section of Rural Economy of the Paris Academy of Sciences, known for his work on the physiology of plant and animal foodstuffs, on June 16, aged seventy-two years.