

been without success in the realms of science, medicine, and affairs. In Liverpool his efforts to strip the University of its shell and bare it to the life of the City have left a permanent effect of greatest value, by which he will be remembered here for many years to come. *Vale!*

J. S. MACDONALD.

DR. J. L. E. DREYER.

ON September 14, Dr. John Louis Emil Dreyer died at the age of seventy-four years from an illness which he had resisted for the greater part of a year with an astonishing vitality. By his death astronomers are deprived of the presence of one of the most distinguished historians of their science. There are others who have treated the history of astronomy more comprehensively, but within the wide range of his labours there is certainly none who has excelled Dr. Dreyer in the combination of learning, sagacity, scholarly precision, and clear and well proportioned exposition.

Dr. Dreyer was descended from a family which had long been distinguished, largely as soldiers, in the public service of Denmark. The son of Lieutenant-General F. Dreyer, he was born at Copenhagen in 1852 and was educated at the University of Copenhagen. In 1874 he came to Ireland as astronomer at Lord Rosse's Observatory at Birr Castle. Lord Rosse's famous telescope had been found to be specially adapted to the observation of nebulae, and Dreyer in consequence embarked on the study of nebulae, with which, next to his studies in the history of astronomy, his name is most closely associated. In 1878 his work on nebulae was interrupted by his appointment as assistant astronomer at the Royal Observatory at Dunsink, but it was revived on his appointment in 1882 to be director of the Armagh Observatory. While at Birr he prepared for publication the whole series of observations made with Lord Rosse's telescope from 1848 to 1878, published by Lord Rosse in the *Transactions of the Royal Dublin Society*, 1880, and he also published a supplement to Herschel's catalogue of nebulae with numerous corrections. At Armagh, in addition to minor studies on nebulae, he produced in 1888 the "New General Catalogue of Nebulae and Clusters of Stars," included in the forty-ninth volume of the *Memoirs of the Royal Astronomical Society*, which, with his two supplementary catalogues published in the same series in 1895 (vol. 51) and 1908 (vol. 59), form the standard catalogues to which reference is always made.

While at Dunsink, Dreyer joined Copeland in founding an international astronomical journal called *Urania*, the first number of which appeared in January 1881. In July of that year its name was changed to *Copernicus*. The last number appeared in June 1884. The editors contributed their full share of reports and articles, and the journal is full of matter which, after more than forty years, remains both interesting and instructive. Dreyer's most important contribution was his "New Determination of the Constant of Precession," vol. 2, pp. 135-155, which, though never adopted in practical work, was used by Newcomb in his classical determinations.

At Armagh Dreyer produced in 1886 the "Second Armagh Catalogue of 3300 Stars," but his subsequent publications have been restricted to nebulae and astronomical history. In 1890 he produced "Tycho

Brahe, a Picture of Scientific Life and Work in the Sixteenth Century." Danish patriotism has given rise to much research on Tycho Brahe, but Dreyer found no scholarly biography, which should at once establish the facts in the light of the evidence available and at the same time place Tycho in his true position in relation to the progress of astronomy and to the life and thought of his time. Dreyer's volume, which is as illuminating as it is scholarly, supplies this want. In 1913 he began the publication of a complete edition of Tycho's works, of which ten volumes have appeared and the remaining four are stated to be complete in manuscript. This edition must probably be regarded as in the main a work of piety. The preparation of the text must have been a laborious task. The notes, in Latin, are brief, but exhibit the editor's usual scholarship. He has among other things taken the pains to discover what editions of the classics Tycho used.

In 1906 appeared Dreyer's "History of Planetary Systems from Thales to Kepler." The history of planetary systems for those ages is practically the history of astronomical theory. Here as usual we find that mastery of authorities and that sober judgment in weighing doubtful evidence that we should expect from a scholar alone, combined with that skilful interpretation and sympathetic exposition that only an astronomer could give. Dreyer returned to parts of this subject in two papers contributed to *Monthly Notices of the Royal Astronomical Society* in 1917 and 1918, in which he effectively disposed of the long prevailing idea that Ptolemy's star catalogue did not rest on his own observations, but on those of Hipparchus or Menelaus reduced to his own time. In 1920 he succeeded, largely as a result of research on manuscripts at Oxford, in restoring the original form of the Alfontine Tables (*Mon. Not. R.A.S.*, vol. 80, pp. 243-62). He took the leading part in the editing of Sir William Herschel's "Scientific Papers," published in 1912, and a very large share in the volume which the Royal Astronomical Society has recently produced on the first hundred years of its history.

Distinctions came as a matter of course. In 1916 Dreyer received the gold medal of the Royal Astronomical Society, of which he was president from 1923 until 1925. He received the honorary degree of D.Sc. from the University of Belfast, and of M.A. from the University of Oxford, in which city he had settled on his retirement from Armagh in 1916.

In private life Dreyer was unobtrusive, but accessible. He spoke quietly, and with the same deliberation and authority with which he expressed himself in public. His learning was always available to those who wished to benefit by it, and he will be greatly missed. His wife, a daughter of John Tuthill, of Kilmore, Co. Limerick, whom her friends hold in affectionate remembrance, died in 1923. He leaves three sons, all distinguished in the fighting services of the British Crown, and one daughter, who is married to Mr. Warham Shaw-Hamilton, late of Dartan, Co. Armagh.

MR. J. H. MUMMERY, C.B.E.

THE death of John Howard Mummery on August 30, whilst on a holiday visit to Cornwall, deprives the world of an eminent microscopist. Born on January 19,

1847, he was educated privately, previous to entering the medical school of University College Hospital. After qualifying as a member of the Royal College of Surgeons, and taking his L.D.S. diploma, he joined his father, a well-known dental surgeon and research worker, in practice in Cavendish Place, London, W.

During his studentship, whilst working under Sharpey, Mummery showed great aptitude for microscopic technique; this bent he developed to a remarkable degree. Specialising in dental histology, admittedly one of the most difficult branches of the art, he achieved a world-wide reputation. His most important papers were contributed to the *Philosophical Transactions of the Royal Society*, and include "Some points in the Structure and Development of Dentine," Ser. B, vol. 182, 1892; "On the Distribution of the Nerves of the Dental Pulp," Ser. B, vol. 202, 1912; "On the Process of Calcification in Enamel and Dentine," Ser. B, vol. 205, 1914; "On the Nature of the Tubes in Marsupial Enamel and its Bearing on Enamel Development," Ser. B, vol. 205, 1914; "On the Structure and Development of the Tubular Enamel of the Sparidæ and Labridæ," Ser. B, vol. 208, 1914; "The Epithelial Sheath of Hertwig in Man, etc.," Ser. B, vol. 209, 1919; "On the Nerve-end Cells of the Dental Pulp," Ser. B, vol. 209, 1920. Of these, the most remarkable is that dealing with the final distribution of the nerves of the dental pulp. Here was a problem the solution of which had been attempted by many workers; by dogged patience Mummery succeeded in demonstrating the passage of fine neuro-fibrils into the dentinal tubes. His work, too, on enamel tends to prove that this tissue is not wholly inorganic in structure but possesses an organic content, and is capable of exhibiting a vital reaction to injury and disease.

It is impossible here to allude to all of Mummery's numerous papers, dealing not only with the histology of normal tissues, but also many others of a pathological nature. These are to be found in the *Transactions of the Odontological Society of Great Britain*, *Proceedings of the Royal Society of Medicine*, and various British and foreign medical and dental journals; his last, "The Pathology of Chronic Perforating Hyperplasia of the Pulp," appeared in the *British Dental Journal* within a month of his death.

In 1919 Mummery published his text-book "The

Microscopic Anatomy of the Teeth," which at once became popular with students. A second edition in 1924 was enlarged to include the general anatomy of the teeth, both human and comparative, and will no doubt remain a standard text-book for years to come.

Mummery was a first-class draughtsman, and his publications are enriched and their value enhanced by his own delightful drawings, in addition to the photomicrographs of his brilliant sections. He was also a water-colour painter of considerable merit.

It is given to but few to remain in active work, with intellectual powers undiminished, for four score years. To his intimate friends Mummery never appeared old. After visiting him in his study one came away stimulated by the suggestions emanating from his fertile brain, and steeped in admiration of his broad and catholic outlook.

Many honours came to Mummery; he was a past president of the old Odontological Society of Great Britain, and the first president of the Section of Odontology of the Royal Society of Medicine, which Society afterwards elected him an honorary fellow. The Royal College of Surgeons of England elected him a fellow and awarded him the Sir John Tomes Prize in 1897. He was a past president of the British Dental Association, and chairman of its representative board. International honours were also his; the University of Pennsylvania gave him its D.Sc. degree; he was president of the sixth International Dental Congress, and was awarded the Miller Prize by the International Dental Federation in 1922 for his original research in dental histology. During the War he acted as superintendent and registrar of the Maxillo-Facial Hospital, for injuries of the face and jaws, at Kennington, and for his services there received the C.B.E.

Mummery will ever rank among the worthies of his profession, as a distinguished follower of Thomas Bell, James Salter, John and Charles Tomes. M. F. H.

WE regret to announce the following deaths:

Prof. F. W. Gamble, F.R.S., Mason professor of zoology and comparative anatomy in the University of Birmingham, on September 14, at fifty-seven years of age.

Dr. A. W. Rowe, Lyell medallist of the Geological Society in 1911, who was distinguished for his researches on the zones of the White Chalk of Kent and Sussex, on September 17.

### News and Views.

ON September 17, the *Morning Post* published a Reuter message from Berlin to the effect that Profs. Paneth and Peters of that city had, after years of experimenting, succeeded in transforming hydrogen into helium "with the aid of particles of metal." This announcement, if correct, is of great importance and will evoke even more interest than the claim by Miethe and Stammreich to have transmuted mercury into gold. The two claims differ, however, in the important respect that whereas the experiments of Miethe and Stammreich, and of Smits, indicated disintegration of heavy atoms into lighter ones, those now announced involve the synthesis of an element from a lighter one, thus more nearly approaching the

alchemist's dream of changing the relatively light base metals into the heavier gold and silver.

To judge by the published literature, recent efforts at the transmutation of elements seem to have been concentrated on disintegrating heavy atoms—a course doubtless suggested by radio-active disintegration and by Rutherford's transmutation experiments with  $\alpha$ -particles—but modern views on atomic structure also adumbrate the possibility of synthetic transformations. According to these views the hydrogen atom consists of one positively charged unit of electricity (a proton) with a single electron revolving round it; and the helium atom contains a nucleus