

apprenticeship ended, he entered the employ of Tompion, afterwards marrying his niece and succeeding to his business at the Dial and Three Crowns, Fleet Street. In 1720 Graham moved across the street to the Dial and One Crown to a shop which was destined to become famous, and it was there he died, Nov. 20, 1751. The friend of Newton, Halley, Molyneux, Hadley, Bradley, and many others, Graham lived for the advancement of science and the benefit of mankind, and though his business brought him ample means, so little account did he take of wealth that on principle he refused to accept interest on loans and never invested in Government securities. To his more intimate contemporaries he was known as honest George Graham.

Of the life of such a man we cannot know too much, and both horologists and astronomers will read with interest the pamphlet issued by the *Vassar Journal of Undergraduate Studies*, giving Miss C. D. Hellman's sketch of George Graham, maker of horological and astronomical instruments. Miss Hellman has taken the trouble to consult most of the original works which give information of Graham's scientific inventions and observations and her account is the fullest we have hitherto seen. Graham's position among his fellows can be judged from the facts that in 1720, when he took up his residence at the Dial and One Crown, he was elected a fellow of the Royal Society, and that two years later he was made Master of the Clockmakers' Company. He had already invented the 'dead beat' form of the anchor escapement for clocks and watches, and in 1721 had brought out his mercurial pendulum, an improvement which became of great importance.

With these inventions to his credit, Graham then

proceeded to add to his reputation by observations on the magnetic needle, during which he discovered the diurnal variation and measured the magnetic intensity. In 1725 he made his well-known 8 ft. quadrant for Greenwich Observatory and at the same time constructed sectors for both Molyneux and Bradley. Much of Bradley's work at Kew was done with his assistance. Other instruments he made were those supplied to the French Academicians who in 1736 visited Lapland to measure an arc of the meridian. At his house in Fleet Street he observed comets, solar and lunar eclipses, sometimes by himself, sometimes with a fellow-observer. He also served on a committee connected with Greenwich Observatory, and carried out work in connexion with the standards of measurements. On all these matters Miss Hellman gives an account, and her pamphlet contains extracts from Graham's paper published in the *Philosophical Transactions*. Without an equal in his own line, Graham lived to see the rise of Mudge, Harrison, Dollond, Bird, Short, and others, in whose hands scientific instrument making reached a pitch of excellence surpassing even that of Graham. Most of these, however, owed something to Graham, and Bradley once wrote: "If my own Endeavours have, in any respect, been effectual to the advancement of astronomy, it has principally been owing to the advice and assistance given me by our worthy member, Mr. George Graham, whose great skill and judgment in mechanics, joined with a complete and practical knowledge of the uses of astronomical instruments, enable him to contrive and execute them in the most perfect manner". "No greater tribute than this", says Miss Hellman, "could be paid to George Graham."

Obituary.

DR. RICHARD WETTSTEIN.

THE death on Aug. 10, at the age of sixty-eight years, of Dr. Richard Wettstein, Ritter von Westersheim, Hofrat, professor of systematic botany and director of the Botanic Garden and Institute of the University of Vienna, removes a notable figure from the botanical world. His commanding presence, courteous demeanour, and powers of oratory give credence to the statement by the correspondent of the *Times* that on more than one occasion he was seriously considered as a possible president of the Republic.

Among botanists, Wettstein was known as a careful and painstaking investigator, a capable teacher, and an efficient organiser. He studied at Vienna under Anton Kerner von Marilaun, author of the well-known volumes on the natural history of plants, and, after a short period as a *privat-docent*, went in 1892 to Prague, where he followed Heinrich Willkomm as professor of botany in the German University. Seven years later he returned to Vienna to succeed Kerner, whose daughter he had married, as University professor and director of the Gardens. Shortly after his return, a com-

modious botanical institute was erected to replace the historic but meagre old buildings at the Gardens, and here Wettstein played the part of host to the delegates who met to formulate the Rules of Botanical Nomenclature at the International Botanical Congress in 1905, of which he and Prof. Julius Wiesner were joint presidents. More recently, as senior president of the International Horticultural Congress, in September 1927, Wettstein again welcomed botanists and horticulturists from all parts of the world at the University.

In 1889, while still *privatdocent* at Vienna, Wettstein succeeded Alexander Skofitz as editor of the *Oesterreiche Botanische Zeitung*, which he continued to edit, with some assistance in later years, until his death. The volumes of this journal contain numerous contributions from him relating to the Austrian flora, of which he was a careful student, to systematic botany, and to nomenclature. The journal took a leading part in preparation for the discussions on nomenclature at the Congress in 1905. In 1901, Wettstein led a botanical expedition to South Brazil under the auspices of the Austrian Academy of Sciences, the results

of which he published in the *Denkschrift* of the Academy.

Wettstein's chief contributions to botanical knowledge lay in the application of principles of phylogeny and morphology to taxonomy. His monograph of *Euphrasia* (1896) was an intensive study of the species, and their origin and affinities, especially in relation to their geographical distribution. He also developed the idea of *Saisondimorphismus*—the evolution of early and late flowering forms of one stock—as a source of new species. A similar study of a group of European gentians appeared in the following year. He had previously (1891) contributed accounts of the families Solanaceæ and Scrophulariaceæ to the "Pflanzenfamilien", and a "Beitrag zu Flora Albaniens" was published in 1892 as a volume of the "Bibliotheca Botanica". He was a good draughtsman and his botanical contributions are illustrated largely by himself. To botanical students, Wettstein is familiar as the author of a widely used "Handbook of Systematic Botany" (1901-8); he attempted to derive the Angiospermous flowering plant from the Gymnosperms through the Gnetales, regarding *Casuarina* as the most primitive existing Angiosperm. The theory was an ingenious one, but has not been generally accepted.

Wettstein was honoured by his fellow-countrymen

and also received many marks of recognition from European and overseas societies and institutions. He was elected foreign member of the Linnean Society of London in May 1914.

A. B. RENDLE.

WE regret to announce the following deaths:

Mr. M. M. Pattison Muir, senior fellow of Gonville and Caius College, and formerly prælector in chemistry in the University of Cambridge, on Sept. 1, aged eighty-two years.

Prof. A. S. Pringle-Pattison, emeritus professor of logic and metaphysics in the University of Edinburgh, on Sept. 1.

Dr. Droop Richmond, chief analyst to Boots Pure Drug Co., Nottingham, for sixteen years, on Aug. 26, aged sixty-four years.

Dr. Per Axel Rydberg, for the last thirty-two years curator of the New York Botanical Garden in the Bronx, on July 25, aged seventy-one years.

Dr. Louis W. Sambon, a pioneer worker in tropical medicine, on Aug. 31.

Col. the Hon. Milo G. Talbot, C.B., who was awarded a Royal Medal of the Royal Geographical Society in 1909, known for his surveys of the north-west frontier of India and Anglo-Egyptian Sudan, on Sept. 3, aged seventy-six years.

News and Views.

THE very personal appeal of the problems of the internal secretions is sufficient guarantee that the valuable résumé by the master in this subject which appears as a Supplement to this week's issue of NATURE will be widely read. Both author and subject came into being at about the same time and both have grown and developed side by side. During the eighty odd years of a fruitful scientific life, Sir E. Sharpey-Schafer has not only witnessed the change of view regarding the basis of animal behaviour but also he has played a prominent part in bringing about this broader basis. It is being realised more and more that racial and individual characteristics are not solely the expressions of an inherited nervous system but are also dependent, though to a lesser degree, on the development and efficiency of the organs of internal secretion. Many unwarrantable assertions appear from time to time regarding the part played by these special glands in the determination of personality, and until further information concerning their variations with age, climate, and habitat are available, such statements must continue to remain of a highly speculative nature. As in all subjects, during the constructive period, some confusion creeps into the nomenclature, but up to the present no better term has been introduced to connote an internal secretion than the word 'autacoid' proposed by Schafer to express the drug-like action of such a chemical regulator; it is more accurate though less euphonic than the term 'hormone' introduced by Starling, which was origin-

ally intended to suggest excitation only and would thus exclude depressing autacoids.

THE methods of studying these autacoid substances are based largely, first of all, on the loss or removal of the particular gland, with observation of the resulting deficiency disease set up, and secondly, with the cure of the disease by grafting or feeding with the gland from a healthy animal, or alternatively by injection of an extract of the gland, and lastly by administration of the active chemical principle when this is known. The method which has been most extensively used and has proved the most fertile in ascertaining important facts is the injection of extracts into animals and into man. This technique was not used much until Schafer, working in conjunction with Oliver, discovered that extracts made from the adrenal bodies give rise—when injected into the veins of an animal—to a very great increase in blood pressure. It is worthy of mention that all the fundamental facts were noted by Schafer in his early papers. In his work with Oliver he observed that one other gland extract besides that of the adrenal, namely, the pituitary, also contained a pressor principle, and an extract of this gland is now widely employed by obstetricians for the arrest of hæmorrhage after childbirth. The account of the interrelationships of the organs of internal secretion given by Schafer does not warrant the present-day wholesale dissemination of poly-glandular preparations coming from foreign drug manufacturers.