

Following publication of the report of this discussion, notice was given of a Grace approving in principle the policy of dividing mineralogy and petrology for the purposes of teaching and research into crystallography on one hand and mineralogy and petrology on the other. The Grace was passed unopposed on Mar. 8. This is the first part of the Syndicate's report, which received almost unanimous support in the discussion: the second was the desirability of housing mineralogy and petrology in a new building, thus making room

for crystallography in the old. It is to be hoped that the means will speedily be found to build and equip the new laboratories and thus to make possible in Cambridge the kind of teaching and research on the need for which there seems such unanimity of opinion among competent judges. It may be remarked that every branch of research mentioned in the discussion, both in X-ray work on crystal structure, and in the study of ores, of rocks, and of silicate-melts, has its direct application in industry.

Obituary.

PROF. F. M. EXNER.

FELIX M. EXNER, professor of geophysics in the University of Vienna, director of the Zentralanstalt für Meteorologie und Geodynamik, Vienna, and joint editor with Süring of the *Meteorologische Zeitschrift*, died in Vienna on Feb. 7. Exner, who was a son of the physiologist Sigmund Exner, was born in Vienna on Aug. 23, 1876. He was educated at the University of Vienna, where he graduated as Ph.D. in 1900. After ten years as assistant at the Zentralanstalt, he became professor of cosmical physics at the University of Innsbruck in 1910, returning to Vienna in 1917 to take up the post of director of the Zentralanstalt and professor of geophysics.

Exner was a very active research worker in meteorology and allied sciences, and published a large number of papers in the proceedings of the Vienna Academy of Sciences, the *Meteorologische Zeitschrift*, the *Annalen der Hydrographie*, and various other journals. These papers cover a wide field. He was particularly interested in the mechanism of changes of pressure, and in the earlier years, in the correlation between meteorological factors over different regions of the globe. He treated the latter question at great length in a paper in the proceedings of the Vienna Academy of Sciences, vol. 122, the work having been largely carried out during a visit to the United States.

Exner was an industrious and sound, rather than a brilliant worker, and he will be remembered for his treatise "Dynamische Meteorologie", rather than for his original work. This book, which gives a very clear exposition of the outlook of the Austrian school of meteorologists, stands alone to-day as the only available exposition of the mathematical aspects of meteorology. Its preparation, which must have involved years of unremitting labour, was doubtless facilitated by his appointment to the professorship of cosmical physics at Innsbruck. The Austrians are fortunate in having this professorship, to which they can appoint a young man to enable him to carry on research work or authorship unimpeded by official duties, and this professorship has usually been the avenue of approach to the post of director of their meteorological service.

There is no text-book in the English language which is strictly comparable with Exner's. The dynamical methods followed by Exner, Margules,

and others of the Austrian school of meteorologists have not been very widely used in England or the United States, and as a result, English text-books are either descriptive or physical, rather than mathematical. Thus Exner's book has met a widely felt need among meteorologists, and is one of the few books of which we can say with complete honesty that it is indispensable to any serious student.

Exner was also the author of an article on dynamical meteorology in the "Enzyklopädie der mathematischen Wissenschaften", but a more outstanding service to science was the publication in 1922 of a revision of Pernter's classic text-book on meteorological optics. He also prepared the European portion of "World's Weather Records", published by the Smithsonian Institution.

As director of the Austrian meteorological service, Exner was a member of the International Meteorological Conference. His pleasing personality won him the respect and liking of his international colleagues, and his death will be regretted by meteorologists throughout the world. D. B.

DR. G. G. CHISHOLM.

GEORGE GOUDIE CHISHOLM, who was the first lecturer (1908) and later the first reader (1921) in geography at the University of Edinburgh, and acted also as secretary of the Royal Scottish Geographical Society from 1910 to 1925, died very suddenly in Edinburgh on Feb. 9. Born on May 1, 1850, he was thus on the eve of completing his eightieth year, though few of his associates realised the fact; his mental vigour being unimpaired to the end, while even physically there were few signs of age.

A native of Edinburgh, Dr. Chisholm attended the Royal High School there and took the degrees of M.A. and B.Sc. at the University, which after his retirement in 1923 bestowed upon him the LL.D. He spent his earlier life in Scotland, going to London in 1895. There, until the date of his Edinburgh appointment, he was engaged in lecturing and literary work, and soon became a prominent figure at the annual meetings of the British Association, being president of Section E (Geography) in 1907. Of his writings, those through which his influence was most felt were his "Handbook of Commercial Geography", first published in 1889, of which an eleventh edition appeared in 1928,

and "Longmans' Gazetteer of the World", of which he was editor, which first appeared in 1895 and has been often reissued. Both works show that rigorous accuracy in detail, based upon profound and wide research into original sources, and that sober and balanced judgment which were his outstanding characteristics.

Dr. Chisholm may, indeed, be said to have been one of the founders of scientific geography, particularly from the economic side, within Great Britain. Not only did he show that it demanded as exact scholarship, as wide knowledge as the subjects which had been recognised earlier as worthy of academic rank, but also at a time when, with the apparently sudden recognition of its interest and wide ramifications there was grave risk of hasty generalisation, he insisted upon the need for precise and, if possible, statistical proof of fundamentals. Rigidly conscientious himself, and with a passion for accuracy and completeness of statement, he was peculiarly impatient of slovenliness, whether in speech or thought, and if modern geography in Great Britain may seem to have developed relatively slowly, it is to Dr. Chisholm largely that we owe the fact that its foundations have been well and truly laid.

Dr. Chisholm's influence also extended far beyond the limits of his own country. His "Handbook of Commercial Geography" had the rare distinc-

tion of being translated into Arabic, and he carried on an extensive correspondence with geographers, economists, and others throughout large parts of the world. It was characteristic that his handwriting was clear and precise to the end and that he would give to letters, even on trifling matters, the same care and attention as to his own special work. His help and advice were, in consequence, constantly asked for, and so freely given as to bring him into contact with a wide circle. Though never in much sympathy with the narrowly nationalist Scottish point of view, he was a Scot of the best type, upright, honourable to the last degree, fair-minded, indifferent to worldly advancement, but profoundly concerned with the deeper problems of man's destiny, and too clear-sighted to be content with easy solutions. Even apart from his influence on economic geography and history, which was both wide and deep, the example he set of a life devoted to the search after knowledge was an inspiration to all who knew him.

WE regret to announce the following deaths:

The Hon. Edward Gerald Strutt, C.H., past president of the Surveyors' Institution and agricultural adviser to the Board of Agriculture during the War, on Mar. 8, aged seventy-five years.

Prof. Eugenio Rignano, professor of theoretical philosophy at the University of Milan and editor of *Scientia*, on Feb. 9.

News and Views.

SINCERE regret will be felt throughout the world of science at the destruction by fire of a large part of Lord Rayleigh's laboratory at Terling Place, Chelmsford, Essex, on Mar. 7. After taking his degree at Cambridge in 1865, the late Lord Rayleigh found great difficulties in getting opportunities for experimental research or instruction in laboratory work. Three years later he started experiments on his own account at Terling Place, and from there produced a number of papers which at once secured for him a position as a leader in physical science. When he resigned from the chair of experimental physics at Cambridge in 1884, he continued his researches in his private laboratory, and it was there that he carried out the precise determinations of the density of nitrogen which led to the discovery of argon. The simplicity of the apparatus used by the late Lord Rayleigh is well known, and most visitors to the laboratory were astonished that results of prime significance could be obtained with such modest equipments. We are glad to know that most of this historic apparatus has been saved as well as all books and papers belonging to the late Lord Rayleigh.

THE upper storey of the laboratory at Terling Place—originally a stall loft—has been burnt out; it was here that the main work on argon was done. Among the pieces of historic apparatus which have been destroyed are the original Rayleigh refractometer and the manometer used for adjusting the pressures of gases to an accurate standard in the weighings of nitrogen, hydrogen, and oxygen. Most

of the present Lord Rayleigh's chief working instruments have also been destroyed and much preparatory work for experiments in progress is gone. The apparatus thus lost includes several valuable spectrographs, quartz apparatus and lenses for investigating the optical properties of mercury vapour, air pumps, equipment for measuring the light of the night sky by photo-electric cells, and other instruments used in recent or current researches. It is distressing to have to record a disaster of this kind, and we ask Lord Rayleigh to accept the sincere sympathy of scientific workers everywhere at the losses he has suffered and the consequent interference with his research work.

THE Department of Scientific and Industrial Research has, since the inception of research associations, always emphasised that the associations, to be eligible for grant from the Department, must secure adequate financial contributions from industry itself. While the securing of this support from the great industries has not been an easy matter, it is gratifying to find that in several of the most important industries of Great Britain a general levy is made in order to provide funds for particular research associations. The report of the council of the British Research Association for the Woollen and Worsted Industries for 1929-1930 indicates that this Association is about to complete an arrangement under which the wool textile industry will submit to a voluntary levy on imported wool, mohair, and so on, as well as to a levy on those processing sections of the industry which do not pay the levy on the raw material. The income which will