## Mineralogy at Cambridge.

THE report of a syndicate appointed by the Council of the Senate of the University of Cambridge to consider the position of mineralogy in the studies of the University was the subject of a lengthy discussion in the Senate House on Jan. 28. The recommendations contained in this report were summarised in a leading article in NATURE of July 13, 1929. They have since been reported on by the University Boards concerned and by the Committee of the Natural Sciences Tripos.

The proposals for the creation of two departments —one of mineralogy and petrology, and one of crystallography—met with approval in principle, but the Financial Board had already indicated that no money was forthcoming to meet the additional expenditure involved except "at the expense of existing University activities". No definite opinion is expressed on the proposal to make 'half-subjects' in the examination of crystallography and of mineralogy and petrology, as this involves problems of some difficulty. It is, however, suggested that the regulations for the Natural Sciences Tripos should receive general reconsideration.

The Syndicate included distinguished representatives of every science bordering on mineralogy, and it was perhaps natural that its report (which was unanimous) should have dealt mainly with the relations of mineralogy to other sciences. The discussion, however, was left entirely to mineralogists and geologists, among whom the report has aroused very considerable interest and some controversy. That this interest is not confined to resident members of the University is indicated by the fact that speakers in the discussion included two professors of geology in London, the professor of geology in Edinburgh, and four of the curators of the two great collections of minerals and rocks in London (the Natural History Museum and the Museum of Practical Geology). The resident members of the University participating in the discussion (which occupies twelve pages in the *Cambridge University Reporter*, Feb. 11) were the professors of geology and mineralogy, the chairman and secretary of the Syndicate, the reader and the lecturer in petrology, the lecturer in structural crystallography, and two other members of the staff of the Department of Mineralogy.

The speeches of the professor of mineralogy and of the lecturers in petrology and in structural crystallography outlined the possible scope and the present difficulties affecting teaching and research in their subjects.

The lecturer in structural crystallography spoke whole-heartedly in favour of a separate Department of Crystallography, and with this recommendation of the Syndicate the other speakers (with two exceptions) seemed disposed to agree. The professor of mineralogy regretted that the Syndicate had not considered the possibility of housing crystallography, mineralogy, and petrology under one roof, and quoted the examples of Zurich and Göttingen. Mr. Hallimond felt that any Department of Mineralogy had a reason for having an X-ray department on the crystallographic side, while many parts of the X-ray researches, involving some of the most advanced theories of modern physics, really belonged to that Department. Additional point was given to this suggestion by the remarks of the lecturer in structural crystallography, who seemed to envisage a department for the X-ray study of the solid state, and foretold a remodelled teaching of crystallography which evidently gave some of the mineralogists seriously to doubt whether "the teaching of such crystallography and crystal physics as is required by students of mineralogy and petrology" would be provided by the new department. Another speaker made it clear, however, that the need in X-ray research of a sound knowledge of geometrical 'surface' crystallography was fully realised.

On the recommendation to bring mineralogy and petrology into one department and to house them in a new building adjacent to the Sedgwick Museum, the speakers were almost all in agreement, The only important difference of opinion revealed is on the extent to which the study of advanced petrology should be restricted to students of geology, and whether the association of the newly constituted department should be quite so close as that provided for in the recommendations for the reorganisation of the Tripos.

Non-residents with experience in other universities spoke highly of the teaching of both mineralogy and petrology in Cambridge, and emphasised the need for maintaining its schools in these subjects in the pre-eminent positions which they have occupied in the past. On the other hand, it is evident that many speakers considered that the progress of both studies was seriously hampered, if not actually stopped, for want of adequate accommodation and facilities for research along modern lines. Particular stress was laid on the urgent need for a laboratory for research in experimental petrology on the lines so successfully followed at the Geophysical Laboratory of the Carnegie Institution of Washington.

The lecturer in petrology made a good point when he remarked that research and Part II work in mineralogy was spasmodic, and therefore unsatisfactory, because of the few openings available for men trained in mineralogy alone. The union with petrology (and geology) would, he thought, induce a steady flow of students to take up Part II work and research in the two subjects. Prof. Watts spoke strongly in the same sense of the extensive increase in the possibility of research which would be offered by the united departments. He also reminded his hearers that a proposal to establish a laboratory in Cambridge on the lines of that of the Carnegie Institution of Washington had been before the Conjoint Board of Scientific Societies several years ago and had been abandoned only because of expense.

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,