and hence would not be swept up by the planet. This limit occurs near magnitude +9, and an increase in numbers fainter than this may therefore arise. A recent radio echo survey of meteor orbits in the magnitude range +7 to +8 shows a new class of orbit of small eccentricity and high inclination, unknown in brighter meteors. These may be meteors of great age that have escaped the sweeping action of Jupiter, and their numbers may well increase rapidly with magnitude.

Many speakers from the floor took part in the ensuing discussion, during which several points of interest arose, particularly on the question of the origin of the various particles. In this connexion it was pointed out that meteors seemed to be very fragile, and hence it was unlikely that they had a common origin with the meteorites. On the other hand, the micrometeorites, which have a high nickel content, might well have a common origin with the meteorites.

UNIVERSITY COLLEGE OF SWANSEA

NEW SCIENCE LABORATORIES

By PROF. H. E. STREET

FROM its foundation in 1920 the University College of Swansea established Departments of Geology and Biology. Geological studies have in turn been directed by Profs. A. E. Trueman, T. N. George and D. Leitch. The present professor, Dr. F. H. T. Rhodes, was appointed in 1956. A lecturer in geography was first appointed in 1931 within the then newly named Department of Geology and Geography. The increasing number of students in geography led the College first to increase the geography staff within the joint department and in 1954 to create a separate department for this subject with Dr. W. G. V. Balchin as its professor.

The Department of Biology from its inception initiated an honours course in botany but only provided zoology courses to the subsidiary level. In 1936, Dr. Florence A. Mockeridge, previously independent lecturer, was appointed professor of botany and head of the Biology Department. On her retirement in 1954 the department was constituted as a Department of Botany with Dr. H. E. Street as professor. In 1956 a separate Department of Zoology was established and Dr. E. W. Knight-Jones was appointed to this new chair.

The development of teaching and research in these sciences, leading to the establishment of four separate departments, made new and more extensive accommodation essential. The College is indebted to the late Prof. Duncan Leitch and to Prof. Mockeridge, who in co-operation with the architects, Sir Percy Thomas and Son, planned the new Natural Sciences Building. This building, sited on a western extension of the Singleton Park campus, is based on an H plan, the centre and main block of which has recently come into full use and is briefly described below. This building is the first in a completely new College lay-out, the planning of which has been made possible by generous grants of land by the Corporation of Swansea. The construction of stage I, for which Demolition and Reconstruction, Ltd., London, were main contractors, was made possible by a capital grant from the University Grants Committee.

The new building provides accommodation for the four Departments, together with a joint natural sciences library and a large joint lecture theatre. The library, large lecture theatre, centre staircase and cloakrooms are grouped around the main entrance axis. The Departments of Geology and Geography

Fig. 1. North face of new laboratories

Fig. 2. General view of joint lecture theatre

occupy the first floor, the Departments of Botany and Zoology the ground floor. A semi-basement houses a range of service and storage rooms, the botany and zoology museums, and the geochemistry laboratories.

The architectural plan is based on a 4-ft. module within a 12-ft. structural grid giving a high degree of flexibility and allowing future adjustment of non-structural walls within the module. The building is steel framed with a centre row of columns giving a depth of approximately 24 ft. to the main laboratories and other rooms on the north side, a corridor of 7 ft. and a depth of approximately 16 ft. to the south side rooms. The cladding of the building is an 11-in. cavity brickwork with a buff facing brick. The windows are constructed in a 4-ft. grid with artificial Portland stone mullions and transoms. The panels in between the ground and first floor windows have a repetitive low relief design representing the four sciences.

The building is generally heated by means of aluminium ceiling panels which also give the ceiling high acoustic properties. The main laboratory floors are of cork tiles finished with plastic sealer. The interior finishes of the working rooms and corridors are in pastel colours of emulsion paint. In the

corridors and laboratories of the Geography and Geology Departments, large illuminated wall areas are cork-panelled for map displays. The entrance hall is in travertine marble and displays the commemorative stone laid by H.R.H. the Duchess of Gloucester on June 29, 1955. The staircases are in coloured terrazzo with non-slip inserts. The metal work throughout has an anodized aluminium finish. The laboratory furniture is in polished hardwood with Burma teak tops to most working benches. In the Botany and Zoology Departments under-bench cupboard units are provided for each student; these units can be readily moved and fixed at any position along the working benches. Corridor doors are glazed to their full length in Georgian wired glass, eliminating the necessity of borrowed lights in the corridors and enabling the back-walls of the laboratories to be fully used for shelf-fittings and cupboards. Water, electricity and gas are laid to all laboratories; the honours and research laboratories in the Botany and Zoology Departments are in addition supplied with compressed air and vacuum. Artificial illumination is effected by the combined use of tungsten filament and daylight fluorescent lights. In the teaching laboratories of the Botany Department bench-mounted adjustable fluorescent lights give even, shadowless, illumination over all working surfaces at an intensity suitable for microscopy. In the Geography and Zoology Departments each student place is provided with a counterpoised bench

lamp. Special protected lights illuminate the vapour hoods and fume-cupboards.

The accommodation for the Department of Geology comprises two general teaching laboratories, one for palaeontology and stratigraphy and the other for petrology and mineralogy, an honours laboratory, a geochemistry laboratory, a general research laboratory, staff research rooms, lecture room, workshop, photographic, rock-preparation and other service rooms. The geochemistry laboratory is equipped with complete apparatus for petrographic analyses. New apparatus for current researches in micro-palaeontology and sedimentary petrology has also been included in the new building. The circulating hall on the first floor is designed to serve as a temporary geology museum and is being furnished with special display cabinets. A large store-room fitted with tiers of dust-proof drawers houses the extensive departmental collections, including a wealth of research and type material from the South Wales coalfield.

The accommodation now available to the Geography Department consists of a large general laboratory, an honours laboratory, lecture theatre, dark rooms, workshop and cartography room, a joint Geography-Geology Map Library and individual staff rooms.

The good map collection has recently been supplemented by a gift of 3,500 maps from the Directorate of the Colonial Survey. The Department is well equipped in surveying, photogrammetric, meteorological and cartographic apparatus. The research interests of the Department are reflected in the special options offered in the honours course—geomorphology, climatology, cartography, historical geography and economic geography.

The Department of Botany is provided with general and honours teaching laboratories, a museum and herbarium, research laboratories for plant physiology, biochemistry and mycology, staff research rooms and a range of service rooms. A well-equipped workshop and a set of four controlled environment rooms are shared with the Zoology Department. The mycology research laboratory is provided with terrazzo bench tops and with sterilizing and aseptic-transfer rooms. The main research proceeding in this laboratory is a study of vascular parasitism, particularly as exemplified by *Verticillium* species. The research laboratories for plant physiology are specially designed for studies involving the aseptic culture of plants, plant organs and tissues. Extensive use has been made in these laboratories of acid-resistant plastics. The main group in plant physiology is studying the growth and metabolism of plant roots, using the techniques of excised root culture. The staff research rooms are currently being used for radioisotope analysis,

enzymology, biochemistry and plant and soil analysis. These facilities are linked to the studies in root metabolism and to work in algal physiology, microbial genetics and the ecology of *Eriophorum*. Hand-coloured plant drawings, pictures depicting landmarks in the history of botany and portraits of famous botanists are displayed in the main corridor and teaching laboratories. These have been given by Prof. Mockeridge, Boots Pure Drug Co., Ltd., Parke Davis and Co., Ltd., and the Wellcome Historical Medical Museum.

The Zoology Department has two large teaching laboratories, a museum, a seminar room, soil ecology laboratory, staff research rooms, aquarium and other service rooms. The soil ecology laboratory contains special apparatus for studying the distribution and metabolism of soil invertebrates. The main research activities of the staff are in marine biology, terrestrial, freshwater and marine ecology and in parasitology.

The field studies of the four Departments are facilitated by the location of their new building in the 50-acre site of wooded parkland adjoining Singleton Park and less than 300 yards from the foreshore of Swansea Bay. This location has as its hinterland to the east the Vale of Glamorgan, to the west the Gower Peninsula and to the north the Brecon Beacons—regions of great natural beauty and scientific interest.

OBITUARIES

Sir William Wright Smith, F.R.S.

SIR WILLIAM WRIGHT SMITH, Queen's Botanist in Scotland, regius keeper of the Royal Botanic Garden, Edinburgh, and regius professor of botany in the University of Edinburgh, died on December 15.

A farmer's son, he was born in Lochmaben, in Dumfriesshire, on February 2, 1875. Thus he had the inestimable advantage of a close connexion with the countryside from his earliest youth onwards. He always delighted in the things of the country and frequently in conversation he would refer to rural scenes and pursuits. Often he proudly claimed to be an accomplished Border shepherd, and few following him on a Scottish hillside would care to deny his physical ability at least.

Wright Smith's start on the long pathway to eminence in the botanical world must date from the day in 1891 when, as a young lad of some sixteen years, he left Dumfries Academy as first university bursar and journeyed to the University of Edinburgh to embark on the course leading to a degree in arts. While pursuing these studies he completed also the diploma course at Moray House Training College for Teachers, for his intention at this time was to enter the teaching profession. He was always a great teacher, and a multitude of students, even those who by the regulations governing the degree they sought were compelled to take botany, will remember his lectures if only for the force of his personality, which made them share the abounding interest he felt in the subject.

After graduation in 1896 he was appointed a teacher, chiefly of secondary subjects, under the Edinburgh School Board. From this point until 1902 he engaged on routine class-work during the day, but in all his free moments he interested himself much and actively in matters scientific, particularly

botanical. So much enthusiasm did he show that the then professor of botany, Sir Isaac Bayley Balfour, asked the young man to leave the school room and come to him as assistant in the University Department of Botany.

Thus started a long personal association between the two men, and as it developed so was the hand of Bayley Balfour seen guiding and training the man he intended as his successor. Now the younger man was given every sort of teaching experience—large classes and small, and subjects from the cryptogams to the flowering plants—and always he was closely and personally associated with the older man in the research they both loved.

In 1907 Wright Smith was appointed to take charge of the Government Herbarium in Calcutta. During the stay of some four years he now made in the East, experience in the widest field—administration of a cinchona plantation and direction of a large garden, work in a large national herbarium on a flora from almost every kind of habitat—was pressed on him. Most valuable of all was the opportunity to make botanical explorations in the high Himalaya. The sphere of this work was chiefly independent Sikkim and the borders of Nepal, Tibet and Bhutan. In 1909 he traversed the then practically unknown area of Llonakh on the Tibetan frontier north of the Kanchenjunga glaciers—two months were spent at an altitude from 14,000 ft. to the limit of vegetation. In 1910 the high Himalaya forming the boundary between the Tibetan valley of Chumbi and Eastern Sikkim was the scene of that year's exploration and yielded vast quantities of material for study later on.

All this time, close contact was maintained between India and Edinburgh, so that in 1911 when Bayley Balfour called upon Wright Smith, he was wonder-