

N_m were uniquely dependent on $\cos \chi$. They are, instead, of elliptical shape, the major axis lying along the equator. Again, in June and December at noon, it has been found that N_m does not attain its maximum value at the sub-solar point but at a latitude displaced therefrom by some 10° towards the equator. It will readily be seen that both these anomalies are also explicable in terms of a perturbation which, *ceteris paribus*, causes N_m to be greater in low latitudes than in higher latitudes. Moreover, a further study shows that these two anomalous features of E -layer morphology, namely, the abnormal diurnal asymmetry and the latitude dependence of N_m , are quantitatively reconcilable.

Finally, it may not be out of place to indicate what we consider to be the significance of these results in the general development of ionospheric studies. Many years ago it was boldly suggested by Balfour Stewart⁷ that the daily rhythmic variations of the earth's magnetic field might be due to cir-

culating electrical currents in the upper atmosphere. The geomagneticians then indicated the intensity and configuration of the upper-atmospheric current system which would be required. The discovery of the ionosphere and the elucidation of its properties by radio sounding has shown that the upper atmosphere is, in fact, sufficiently conducting to be the location of such currents; and the work now described has confirmed the presence of ionospheric currents, of the type prescribed, by way of the distortion they engender in the medium in which they flow.

¹ Appleton, E. V., and Naismith, R., *Proc. Roy. Soc., A*, **150**, 685 (1935).

² Chapman, S., *Proc. Phys. Soc.*, **43**, 26 and 483 (1931).

³ Appleton, E. V., *J. Atmos. Terr. Phys.*, **3**, 282 (1953).

⁴ Martyn, D. F., *Proc. Roy. Soc., A*, **180**, 241; **190**, 273 (1947); **194**, 429 and 445 (1948).

⁵ Appleton, E. V., and Lyon, A. J., "Report on the Physics of the Ionosphere", p. 20 (The Physical Society, 1955).

⁶ Appleton, E. V., *Proc. Fourth Meeting Mixed Commission on the Ionosphere*, p. 14 (1955).

⁷ Stewart, B., "Terrestrial Magnetism", *Encycl. Brit.*, Ninth Ed. (1882).

THE UNIVERSITY OF EXETER

By PROF. HUBERT T. S. BRITTON

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ON October 28 the granting of the Royal Charter, reconstituting the former University College of the South West as the University of Exeter, was approved by an Order in Council at the meeting of the Privy Council, presided over by H.M. The Queen. The Charter appoints Mary, Duchess of Devonshire (widow of the tenth Duke of Devonshire) as the first chancellor of the University of Exeter; Mr. B. G. Lampard-Vachell, deputy president of the College, as a pro-chancellor; and Dr. James W. Cook, principal of the College and formerly regius professor of chemistry in the University of Glasgow, as the first vice-chancellor.

This marks the culmination of the struggle to make Exeter the centre for higher education which began so far back as 1861, when Sir Stafford Northcote (later the Earl of Iddesleigh) outlined his proposals for education at a meeting in Exeter in which he stressed the importance of making the city, "for which I believe it has natural and acquired advantages, a centre of Education for the West". A considerable sum was raised by subscription for the provision of premises for such an institution, and in 1862 a meeting was held to consider how this money could best be used to establish a memorial to the Prince Consort. It was decided that the memorial should be a museum with adjuncts for the study of art, science and literature, and the comments made by the Earl of Devon were prophetic in that the memorial would "continue to future generations the special benefits for which the person to be honoured had in his lifetime devoted himself". In 1865 the erection of the Royal Albert Memorial was begun, and in it evening classes were held in preparation for the Science and Art Department examinations of South Kensington, and there were also extension lectures given under the auspices of the University of Cambridge.

This type of education developed, and a full-time principal, Mr. A. W. Clayden, was appointed in 1894, a part of his salary being paid by the Local Lecture Syndicate of the University of Cambridge. Extensions

of the Royal Albert Memorial became necessary, and one of these was opened in 1895 by the Duke of Devonshire, chancellor of the University of Cambridge. In 1897 the foundation stone of yet another extension, known to-day as the York Wing, was laid by the Duke of York, later King George V. This is the only part of the Memorial Building that is still used by the College, the rest being occupied by the Museum, Art Gallery and College of Art.

The session 1901-2 was notable in the history of the College, for it was then that courses were first devised to prepare some students for the London external degrees of B.A. and B.Sc., and in that year the College was recognized as a day training college for women, Mr. Clayden then becoming principal of the Royal Albert Memorial Museum, Library and College. In 1903 the College was recognized as a day training college for both men and women.

In 1904 the Exeter City Council sought the advice of Prof. (later Sir) Michael E. Sadler, of the Victoria University of Manchester, on the best way of co-ordinating and developing the educational work of the City, and in his report he stated that "Exeter is the educational metropolis of the west", and ended by asking the question, "Can we feel surprise, therefore, that the Royal Albert Memorial College shows many signs of its capacity to become the University College of the West". He records that in July 1904 there were four students preparing for final B.A. and B.Sc., seventeen for intermediate arts and science, thirty-six for London matriculation, eight for preliminary medical examinations and a hundred for the teachers' certificate of the Board of Education.

The College grew and by 1906 more spacious premises were required, and they are the buildings now occupied by the Arts Faculty. Whereas the cost of the original buildings was defrayed almost entirely from public subscriptions made by people living in Devon and Exeter, the cost of this building (£25,000) was met by the City of Exeter, except for a contribution of £6,400 made by the Board of Education.



Fig. 1. University of Exeter: the Arts Faculty Building, Gandy Street

At this time the College was in straitened financial circumstances, and in 1912 an appeal for £30,000 for an endowment fund was launched; but the target was not achieved owing to the outbreak of the First World War.

In spite of repeated objections which were raised by the Board of Education, the City Council adopted the designation Royal Albert Memorial University College in 1908; but it was not until 1918 that it was recognized *de facto* as a university college, though it was not actually placed on the University Grants List of the Treasury until July 26, 1922. Principal Clayden (died 1944) retired in 1920 and was in April of that year succeeded by (later Sir) Hector J. W. Hetherington, who came from University College, Cardiff, where he had been professor of philosophy. He resigned in December 1924 to take the chair of philosophy at Glasgow, later to become vice-chancellor of the University of Liverpool, and is now vice-chancellor and principal of the University of Glasgow.

In its first two principals, University College, Exeter, has been twice blessed. Clayden was a man of vision who realized the need for university education in the south-west of England, and Hetherington, believing that the need was real, was able to persuade the Treasury to include the College at Exeter in the list of university institutions. In 1915, in his presidential address to the Devonshire Association, Principal Clayden forecast a University for the South West and described what he considered to be the scope of the University. Now that the University has become a reality, no doubt serious consideration will be given to his ideas.

From the time of its incorporation, the University College increased in numbers of students and staff and in academic attainment, due in no small measure

to a succession of enthusiastic and energetic principals. They were Sir Walter Moberly (1925), who left in 1927 to become vice-chancellor of the University of Manchester, Dr. John Murray (1926-51), Prof. F. H. Newman (acting 1951-52), who died suddenly in 1952, Prof. S. H. Watkins (acting 1952), Sir Thomas Taylor (1952-53), who died suddenly in 1953, Prof. H. B. Garland (acting 1953-54), and the present vice-chancellor, Dr. James Wilfred Cook. The untimely deaths of Prof. Newman and Sir Thomas Taylor caused the submission of the petition for the grant of university status to be delayed until after Dr. Cook had assumed the office of principal.

The first president of the University College of the South West was H.R.H. the Prince of Wales; but on his accession to the throne as Edward VIII, Sir Henry Lopes (later Lord Roborough) was elected to that office, which he held until his death in 1938. Lord Cranborne (now Lord Salisbury) then became president, and it is a disappointment that, owing to the pressure of his other obligations, he was unable to allow his name to go forward as the first chancellor of the University of Exeter, towards the creation of which he has done so much.

Among the College benefactors may be mentioned Mr. E. J. Mardon, the late Lord Roborough, the late Mr. Washington Singer, the late Mr. C. V. Thomas, the late Mr. A. C. Ballard, the late Sir William Reardon-Smith, and the late Alderman W. H. Reed, at one time Mayor of Exeter. It was he who in 1922 gave to the College, Streatham Hall, a large mansion built in the Italian Renaissance style and now named Reed Hall, with its beautiful gardens and arboretum of eight acres, in the hope that the College would purchase the surrounding fields of more than a hundred acres to form the campus for the Univer-

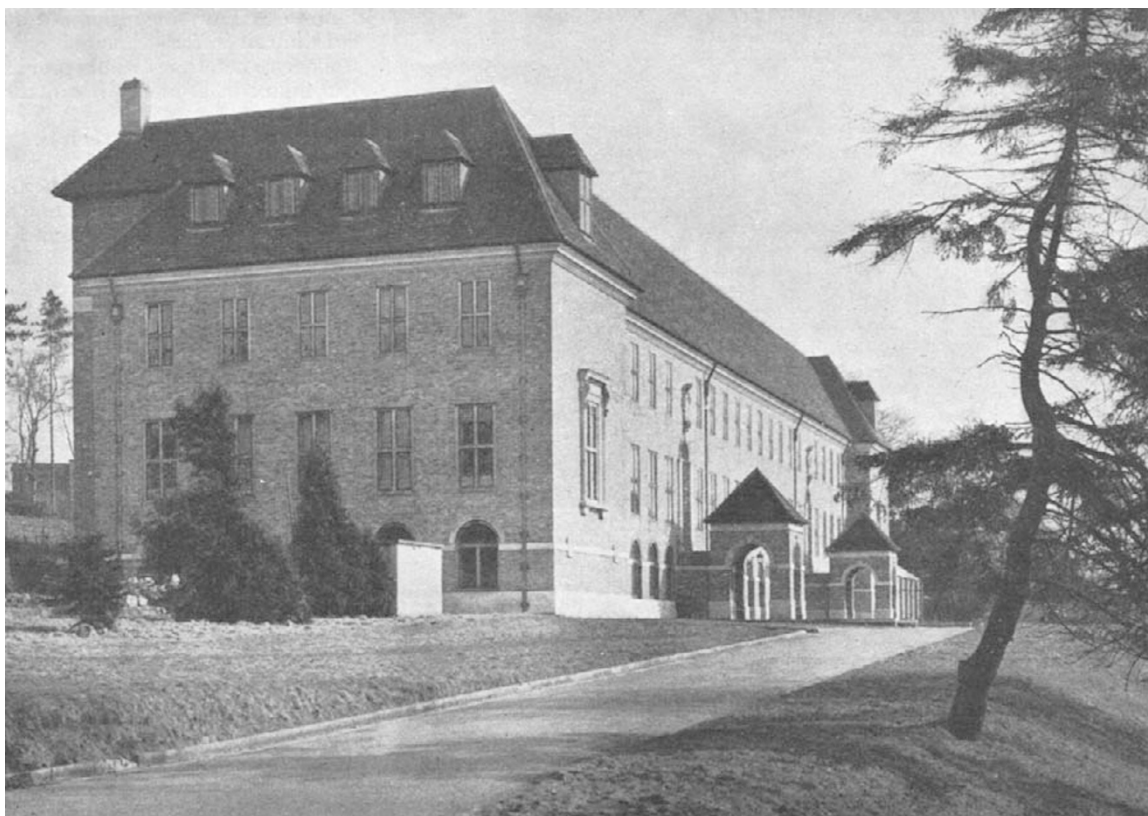


Fig. 2. University of Exeter: Washington Singer Laboratories

sity. It is that provision which has placed the University of Exeter in such a pleasant setting.

Exeter is an ideal seat for a university. Several of the newer buildings of the University already occupy prominent positions on the University campus at Streatham, consisting of some 150 acres, which for beauty is probably unsurpassed by that of any other university institution in the United Kingdom. Its natural beauty is enhanced by the panorama of the varied Devonshire landscape that is to be seen from its slopes. It is situated about a mile north-west of the old buildings.

The original buildings are almost within a stone's throw of the Cathedral. Before the First World War they and the York Wing housed the entire College; but afterwards increased accommodation had to be found. This took the form of several rather unsightly ex-army huts, some of which were destroyed in the air raids of 1942. In 1931 the congestion in the Gandy Street buildings was partially relieved by the removal of the Departments of Chemistry and Physics to the new Washington Singer Laboratories on the University campus; but further relief did not come until 1939, when the library was transferred to the new Roborough Library, and again in 1953 when the Botany, Zoology

and Geology Departments migrated to the new Hatherly Laboratories (see *Nature*, 171, 860; 1953). In consequence, it was found possible to allocate a few rooms in the old building to the Guild of Undergraduates; but there still remains a real need for more space for the social requirements of the students.

The increase in the numbers of students reading, and carrying out research, in chemistry and physics renders imperative the need for additional accommodation. The Roborough Library is filled almost

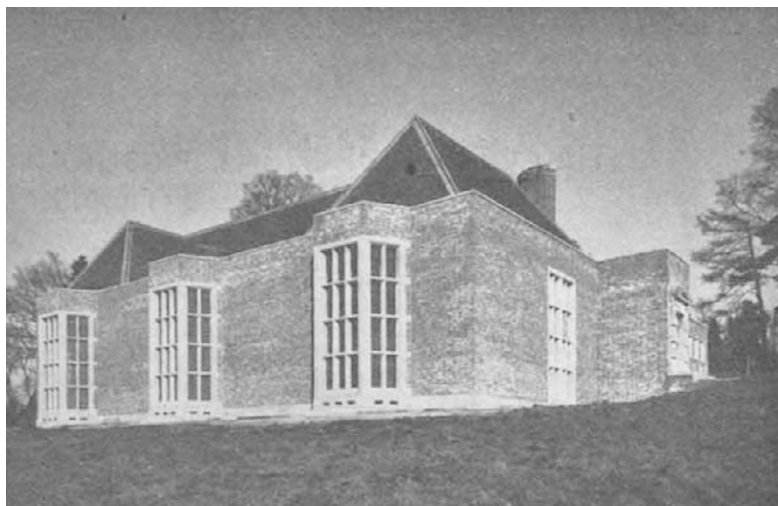


Fig. 3. University of Exeter: Roborough Library



Fig. 4. University of Exeter: Reading Room, Roberough Library

to capacity with nearly 100,000 volumes. The erection on a rather elevated site of a new block for the Faculty of Arts is imminent. The architect of the Singer and Hatherly Laboratories and the Roberough Library and two Halls of Residence, Mr. E. Vincent Harris, is giving the University a chapel, to be known as the Mary Harris Memorial Chapel. Building will shortly begin.

Situated still higher on the southern slope of University campus are the Mardon and Reed Halls of residence for men, while on the top of the hill, which since the War has been levelled, is located a large playing field. By its side is the Taylor Pavilion—a memorial to the late principal, Sir Thomas Taylor. The facilities for sport have just been extended by the erection of a boat-house at Countess Weir on the bank of the Exe canal.

Contiguous with the campus is Knightley, in which the Faculty of Law and the Overseas Students' and Extra-mural Departments are housed, and Thornlea, which, together with a new building close by, accommodates the Department of Education and Psychology and the Institute of Education.

An important policy of the College was to make it residential so far as possible, and in the years immediately prior to 1946 this aim was almost

realized; but since then, despite substantial efforts made by the College to acquire suitable premises, the influx of students has made it necessary for some to live in private lodgings for a part of their stay in Exeter. Of the 1,029 full-time students, who come not only from the south-west of England but also from London and elsewhere in England and Wales and from many overseas countries, 558 live in College halls and the remainder live either at home or in lodgings.

Since its incorporation as a University College, remarkable strides have been made in the training provided for the London external degrees in arts, science, economics and law. The number and quality of the degrees obtained serve as an indication of the high academic status which has been attained. Nor has this progress been confined to

undergraduate training, for considerable attention has been given to postgraduate training and research. In the sciences, research has been a strong feature, as may be seen from the number of original papers published in the scientific journals and the number of Ph.D.'s which have been gained by Exeter students. Facilities for research in astronomy are also available in the Norman Lockyer Observatory at Sidmouth, which for many years past has been closely associated with the University College. On the arts side, abundant material for investigation has been rendered available to the students by the recent agreement of the Dean and Chapter of the Cathedral to entrust the College Librarian with the care of the unique library of the Cathedral.

For the time being, the University of Exeter will develop and consolidate its existing Faculties of Arts (including Education), Science, Social Studies (including Economics, Social and Public Administration) and Law. Nevertheless, it is safe to say that the possibility of extending its usefulness in other fields of learning and research will always receive the constant vigilance and attention of the new University. Its aspirations and aims will always be to serve mankind, the United Kingdom and especially the inhabitants of the south-west of England.

INTERACTION OF SPRAY PROGRAMMES AND INSECT POPULATIONS

AN open day at East Malling Research Station on September 21 provided an opportunity for some two hundred members to hear and discuss contributions by staff of the Entomology and Plant Protective Chemistry Sections on the interaction of spray programmes and insect populations. Following the usual custom, members of the official advisory services attended a similar programme on the previous day.

It was pointed out that the present investigations, which are devoted to a study of the fruit-tree red spider mite, *Metatetranychus ulmi* (Koch), its natural enemies, and the effect of spray chemicals on

populations of both, are a collaborative project shared by entomologists, plant-protective chemists and plant pathologists. The entomologists are primarily concerned with the biological and ecological problems involved, the chemists with the mechanism of action by which the spray materials in common use affect the insects and mites and, since there is ample evidence to show that fungicides as well as insecticides sometimes prove harmful to the beneficial fauna, the plant pathologists also become intimately involved in such a project. At the present time only a progress report is possible; the causes leading to the appearance of *M. ulmi* as a pest are fairly clear,