WESTFIELD COLLEGE (UNIVERSITY OF LONDON)

NEW FACULTY OF SCIENCE

SINCE its return to London after the break of the war years, Westfield College (University of London) has been a College in the Faculty of Arts only, except for mathematicians, who have taken either the B.Sc. (Special) or B.A. degree. Previously, the College had a small, but flourishing, Department of Botany, but this was relinquished in 1950 as a result of the difficulties encountered in running one science department in isolation.

In November 1955 the College Council decided to press for the re-introduction of science, but on a wider basis, and the advice of Sir Lawrence Bragg and other eminent scientists was sought and most kindly given. The reasons for the decision probably need no advocacy, but are summed up as follows: "We are convinced that the College would gain immeasurably by the re-introduction of Science: past experience has shown that the contact between students of Science and students of the Arts, living and working side by side, is of the greatest benefit to both, in ways difficult to analyse but none the less real". The original plan was to establish a Faculty of Science "comprising Special Honours Departments of Chemistry, Physics, Botany and Mathematics (already in being), with in addition a two-year Zoology course" (afterwards included as a special honours department) and that these departments should "at the same time cover the requirements of the B.Sc. General Honours Degree". The shortage of science teachers in the schools was kept in view, and it was thought that "there might well be a temporary paucity of properly qualified candidates for Special Honours courses (but) . . . that to have the stimulus of Special Honours Departments is the right policy in the long view". A Faculty of approximately two hundred students was envisaged, though this was increased later in the light of advice from the University. The College possessed its old botany laboratories, equipment and materials, which had been retained, and the botany library, where periodicals and series had been kept up to date. It also had a site for extensions.

In June 1956 a small body of experts appointed by the University went to examine the building plans and confer about staffing and accommodation. Their opinion was that the site proposed was too restricted, and an alternative site allowing for more research facilities as well as possible expansion had to be found. It was also stated by the University when examining the estimates that the original plan was too modest and that if the plan were to be given ultimate sanction the College should think in terms of a building costing about half a million pounds, and also that the building must be ready to accept students in October 1961. The building plan was modified more than once to accord with London County Council requirements and finally it became evident that to obtain a site of sufficient dimensions one of the College residences would have to be demolished.

In all these negotiations the College was helped by the criticism and advice of the inspectors appointed by the University, some of whom afterwards became 'science advisers' to the College and to whom it is deeply indebted, notably Prof. H. T. Flint (then Hildred Carlile professor of physics at Bedford College), Prof. W. S. Bullough, professor of zoology at Birkbeck College, and the late Prof. W. Wardlaw, professor of chemistry at Birkbeck College. After his death in December 1958 his successor, Prof. W. G. Overend, consented to act as adviser in chemistry. In botany no special adviser was sought, since there were some past members of the College who had specialized knowledge. The architects responsible for the laboratories are Messrs. Verner Rees, Laurence and Mitchell. The actual demolition of the property to clear the site began in May 1959, and the official laying of the foundation stone of the new building was performed by Sir John Cockcroft in May 1960. Meanwhile, the intellectual foundations have been laid in the present academic year by the appointment of the first professors and by the recognition by the University of the College as a School in the Faculty of Science.

The appointments are as follows:

PHYSICS. *Prof. E. H. Bellamy.* Dr. Bellamy was educated at Quarry Bank High School, Liverpool, and proceeded to King's College, Cambridge, as a State Scholar in 1941. He obtained a first class in the Natural Sciences Tripos in 1943 and then worked for three years as a scientist in the Road Research Laboratory, Department of Scientific and Industrial Research and at British Insulated Callender's Cables, Ltd. Returning to Cambridge after the War, Dr. Bellamy completed a double-first in the Natural Sciences Tripos in 1948 and thereafter did research work in the Cavendish Laboratory for the Ph.D. degree, which he obtained in 1951. During this latter period Dr. Bellamy made the first measurements in Europe of nuclear spins and magnetic moments using atomic beam techniques. He was appointed to a lectureship at the University of Glasgow in 1951 and rendered valuable help in the development of experimental techniques for utilizing the beam of the 300-MeV. synchrotron which operates there. During the past five years, Dr. Bellamy has made many contributions to our knowledge of photoproduction of π-mesons and has very successfully supervised young research students who have collaborated with him in these and other experimental studies. He is at present on short leave of absence to carry out an experiment on the 1,000-MeV. synchrotron at Frascati. Dr. Bellamy has also taken a full share in departmental teaching and social activities at Glasgow, and has been very popular with undergraduate students.

CHEMISTRY. *Prof. W. Klyne.* Dr. Klyne was educated at Highgate School and New College, Oxford, where he read chemistry. Since then he has worked in

Fig. 1. Photograph of artist's drawing of the new Faculty of Science Building, Westfield College. (Artist: William Suddaby. Photographer: Sydney W. Newbery)

the Department of Medical Chemistry in the University of Edinburgh and in the Department of Medical Pathology at the Postgraduate Medical School of London, where he has been reader in biochemistry since 1952. Prof. Klyne has written "Practical Chemistry for Medical Students", which has been widely used. He is an expert and master of stereochemistry, particularly in regard to the biological steroids and the relation of optical rotation and rotary dispersion to chemical structure. His approach to the subject ranges from biochemistry and organic chemistry to the theoretical aspects of the shape of molecules. His interest in scientific method and his past experience should ensure success for this new department of chemistry.

Botany. *Prof. G. E. Fogg.* Dr. Fogg needs no introduction to most biologists for he is well known as a secretary of the Society for Experimental Biology, as one of the co-editors of the Penguin "New Biology" series and as the author of the book "Metabolism of Algae". Dr. Fogg took his degree in botany at Queen Mary College, London, and went to Cambridge to do his postgraduate research. Since 1945 he has been an invaluable and distinguished member, first as lecturer and now as reader, of the Botany Department in University College, London. Dr. Fogg's research work on the metabolism of algae, involving as it does the growing of algae in pure culture and the use of modern techniques, has been distinguished for its skilful, experimental approach. More recently, he has extended this work to the study of the physiology of phytoplankton in fresh water and the sea. Around this new and expanding field of research, Dr. Fogg will be able to build a sound teaching department at Westfield College.

Zoology. *Prof. J. E. Webb.* Dr. Webb returns to Great Britain after a period of eleven years as head of the Department of Zoology in the University College of Ibadan, Nigeria. After graduating from Birkbeck College, London, he held for a short time a post as research entomologist before taking up a lectureship at Aberdeen. His many publications during this period include important contributions on the morphology and ventilation mechanisms of insect tracheae. The creation and development of a flourishing department at Ibadan and of an attractive and well-stocked zoological garden are a tribute to his energy and powers as an organizer. Under his leadership and guidance the Department has acquired a well-deserved reputation for good teaching and research. Many of his students have graduated with honours degrees under the scheme of special relationship with the University of London and have taken up teaching and research posts in Nigeria; two of them are on the staff of the Department. Prof. Webb, besides playing an active part in the affairs of the University College, as dean of the Faculty of Science and member of the College Council, has established himself as an authority on the systematics of the cephalochordates, and his most recently published work, in the *Philosophical Transactions of the Royal*

Society, includes studies on the geomorphology and ecology of the lagoon systems of Lagos and the adjacent coastline.

All these professors will hold office from October 1960, in order to be responsible for final preparations and for appointment of staff before the first intake of students in October 1961. They will select their first students in November 1960, and the schools have already been circularized.

MATHEMATICS. *Prof. E. H. Sondheimer.* The Mathematics Department is in a different position, since the College never ceased to accept students for the B.Sc. special degree. The Department (about fifty students) is at present directed by a reader, but it had long been decided to apply for a chair in due course. The introduction of the Faculty of Science made it desirable that the change should take place now and the first professor of mathematics is Dr. E. H. Sondheimer. He is, at present, University reader in applied mathematics in Queen Mary College, London, a post which he has held since 1954. Prior to this, he held a lectureship in mathematics in the Imperial College of Science and Technology, to which he was appointed in 1951. This was, in fact, his first teaching post. Dr. Sondheimer has had a varied and interesting career; after taking the Natural Science Tripos at Cambridge in 1943, he joined a small team carrying out war work on experimental studies of the properties of transformer sheet steels. At the end of the War he began research work in the electron theory of metals at Cambridge, to which subject he has made several important contributions. He was awarded a Smith Prize in 1947 and in 1948 elected to a research fellowship at Trinity College which he took up in 1950. In the intervening years he worked first under Prof. N. F. Mott at Bristol and later was in the United States, working with Prof. Slater at the Massachusetts Institute of Technology. Dr. Sondheimer is best known for his work on the anomalous skin effect in metals, which was done in collaboration with G. E. H. Reuter. Later extension of this work paved the way for Pippard's pioneering work on determination of the Fermi surface in metals. Dr. Sondheimer's other important contributions include the first successful solution of the Bloch integral equation, the application of variational methods to conduction phenomena in polar semi-conductors, and a general proof of the validity of Kelvin relations occurring in the theory of phonon drag.

CONTROL OF PRE-NATAL GROWTH IN MAMMALS

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TO some extent every mammal decides for itself what size it will attain, in the sense that its own genetic constitution sets limits to its growth. However much we feed a Shetland foal it will not grow as large as a Shire horse. But there is evidence that these intrinsic factors exert their main effects in post-natal life, and that pre-natal growth is largely controlled by the intra-uterine environment.

An early indication of this was Walton and Hammond's[1] remarkable demonstration that the new-born foals of Shire mares crossed to Shetland stallions were almost as large as pure Shire new-borns, while the offspring of the reciprocal cross were as small as new-born Shetlands. The presumption was that the uterine environment was responsible, although the possibility of a cytoplasmic effect was not excluded.

Subsequent work with man[2], cows[3], rabbits[4], sheep[5] and mice[6] has confirmed the existence of large maternal effects upon weight at birth, and in the last three cases it has been shown by means of egg transfer that the effects are indeed mainly uterine.

Equally clear evidence of the importance of factors extrinsic to the embryo is the well-known effect of litter-size on weight at birth in polytocous species. According to Healy, McLaren and Michie[7], when the range of litter sizes in mice is artificially increased, differences of more than two-fold in the mean weights of full-term fœtuses can be obtained. The classical explanation of such effects is that there is a limited pool of nutriment in the maternal blood for which the fœtuses compete[8]. As each draws its ration, so much the less remains for the others.

In this article we review evidence suggesting that this explanation is incomplete, and that most effects of litter size on fœtal growth can be given a more plausible explanation in the elementary principles of hydrodynamics to which the flow of blood to the placenta is subject.

In the case of species with a bicornuate uterus, the theory of a limited pool of nutriment predicts that the growth of a fœtus in one uterine horn will be just as much retarded by the presence of litter-mates in the other horn as in the same horn. But Eckstein, McKeown and Record's[9] study of guinea pig pregnancies showed this not to be the case. They found that the number of embryos in the same horn was more important than the number in the opposite horn in determining both fœtal weight and the weight of the placenta, on which fœtal growth in large measure depends. The picture which emerges from their results can be summarized as in Fig. 1.

With regard to the possible mechanism underlying this scheme, Eckstein *et al.* pointed out that since resistance to blood flow through the placenta is low, the pressure at which blood is supplied to each placenta may be inversely related to the number of placentæ supplied by the uterine artery on the same side. It can be supposed that the supply of blood, and of its dissolved nutrients, conditions the rate of