

by other methods, throw light upon protoplasmic viscosity, and show that alterations of viscosity are quite generally characteristic of mitosis and the activities of embryonal cells.

From the same point of view, Weber points out that high temperatures, narcotics, and other factors influencing mitosis are factors capable of influencing protoplasmic viscosity, as shown by Heilbrunn in his experiments upon sea-urchin eggs. Similarly, Koernicke has shown that under X-rays, and Hartmann that at high temperatures, all the cells of the meristem of the root apex vacuolate. Weber also points out that the rounded nucleus characteristic of the embryonic cell suggests a different and more plastic physical state of nuclear protoplasm, so that the shape is more controlled by surface tension than in the case of the variously shaped nucleus of the differentiated cell that has ceased to divide.

Weber marshals much evidence to show that the hydrogen-ion concentration of the medium can affect the physico-chemical state of the protoplasm, and directs attention to Spek's interesting suggestion that at mitosis, a base, the bye-product of nuclein synthesis, escapes into the cytoplasm with consequent swelling of the plasma colloids and as a result a stimulus to increased nuclein synthesis, so that the process is autocatalytic. Spek explains the cessation of cell division as brought about by a change in permeability permitting increased entry of salts, which neutralise the action of the base released from the nucleus. Certainly in the mitosis of sea-urchin eggs the influence of the hydrogen-ion concentration of the medium has been established as in the experiments of Vles and his co-workers. Lyon has shown

that the carbon dioxide production during mitosis varies at the different stages recognised by the cytologist, whilst Jacobs has tried to correlate these striking fluctuations in carbon dioxide output with the equally striking viscosity changes. As Weber points out, such fluctuation of carbon dioxide output will influence the difference between the reaction of the egg plasma and the outside medium.

The rhythm of cell division may find some explanation in the respiratory production of carbon dioxide. Thus Lopicque has shown that the reaction of the medium in which *Spirogyra* is growing is affected by carbon dioxide production in the dark and its disappearance during photosynthesis in light, and Weber suggests that here may lie the explanation of the fact that cell division in this plant occurs only at night.

Starling is cited for the view that the problem of cancer is the problem of the control of cell growth. Recent studies of cancer with physico-chemical methods enable Weber to refer to investigations indicating that the cancer cell owes its peculiar growth qualities to the medium, the tumour plasma, in which it lies, and that one important factor of this medium is hydrogen-ion concentration.

Weber thus brings a very wide range of phenomena of great general interest under review, and points out in conclusion that the suggestion of Pearsall and Priestley, that the hydrogen-ion concentration is a material factor in meristematic growth, admits of experimental investigation, Heilbrunn, Meier, Endler, and Robbins, amongst others, having suggested methods for determining the iso-electric point of the protoplasm.

Cambridge and the Royal Commission.

PROVISIONAL SCHEME.

THE University Commissioners have communicated to the University of Cambridge a provisional scheme for the inauguration and organisation of teaching in the University on the general lines of the recommendations of the Royal Commission. They propose to draft necessary statutes and ordinances themselves to carry out their scheme, but publish their proposals in outline in order to give members of the University an opportunity of expressing their opinion about the proposals.

It is proposed to constitute as from October 1, 1926, eleven faculties in the arts group and seven in the science group. In the science group there are to be agriculture, biology, engineering studies (including aeronautics), geographical and ethnological studies, mathematics (including astronomy and geodesy), medicine, physics, and chemistry. The faculty of biological studies is to be divided into two sections, each with separate departments: A. (1) botany, (2) genetics, (3) geology, and (4) zoology. B. (1) bio-chemistry, (2) experimental psychology, (3) human anatomy, (4) parasitology, (5) pathology, (6) physiology. The faculty of physics and chemistry is to include the following departments: (1) astrophysics, (2) chemistry, (3) mineralogy, (4) physics.

The separate faculties will be composed of official university and college teachers in the appropriate subjects (including fellows of Girton and Newnham Colleges) and others appointed by the Board of the Faculty. The Board of a Faculty will consist of the professors in the subjects concerned, a certain number of nominees of the faculty, of the Board and of the Council of the Senate, together with representatives of cognate studies. The average number of members of a Board, according to the detailed scheme suggested by the Commissioners, is sixteen.

The new General Board of Studies is to consist of four members elected by the group of arts faculties, four members elected by the group of science faculties, four members of the Council of the Senate, and two persons nominated by the Council, with the vice-chancellor as chairman. The number of university lectureships (and demonstratorships) would be determined by the University for each faculty on the recommendation of the Board of the Faculty and of the General Board. The appointments would be made by a standing committee for each faculty of the vice-chancellor, the head of the department, three members of the Board of the Faculty appointed by the Board, and two persons appointed by the General Board. The normal tenure would be for three years in the first instance, and, on renewal, so long as the lecturer was doing his work satisfactorily, until the retiring age of sixty-five.

According to the scheme, all fees for lectures announced by the General Board would be paid to the University into faculty or departmental funds, the lecturers to be paid a basic wage by the faculty for an obligatory minimum of teaching work, with a scale of increments on the basic salary, with continued tenure of a post, and with additional payments for extra work done. It is contemplated that the University will be able to inform the faculties, before they finally create their new lectureships, how much money, if any, the University can put at the disposal of each faculty board in addition to the fees credited to it.

A great amount of work must lie before the Commissioners and various bodies of the University in getting the scheme into working order; a great amount of work must have been done on it already. It represents the completion of a process which has

been going on for a considerable time by which the organisation of the teaching and the actual teaching itself has been slowly but steadily passing out of the hands of college lecturers into those of university staffs. The creation of the large scientific laboratories and departments has accelerated the change, which is already half completed. The University takes more conscious control of developments and changes in studies. It remains to be seen whether improved organisation will mean better efficiency or whether the initiative of individual colleges fostered in the past may be crushed by the burden of machinery. As ever in such cases, it all depends on the quality of the men who become responsible for driving the machine.

Among other proposals which the Commissioners contemplate is permission for a professor to be continued in office after reaching the age of sixty-five up to, but not beyond, the age of seventy. They also contemplate throwing open all professorships, readerships, lecture-ships, and examinerships to women. This proposal to put women teachers on the same footing as men in the matter of the organisation of teaching removes one of the serious grievances remaining for women at the University. Even though they may not vote in the final decisions of the Senate on matters of educational policy, they will be free as members of a faculty to take part in the more important preliminary discussions which ultimately determine the changes of policy. The Commissioners do not propose to force upon the University, against its expressed wish, the admission of women to membership and to a share in the government of the University. That is to be left to the University itself to settle.

University and Educational Intelligence.

BRISTOL.—A prospectus of the Faculty of Engineering, which is provided and maintained by the Society of Merchant Venturers in the Merchant Venturers' Technical College, Bristol, has just reached us. Courses of study are available at the College for persons intending to engage in civil, mechanical, electrical, or automobile engineering, and particulars of these courses are given in the prospectus. The ordinances and regulations relating to degrees and diplomas in engineering subjects are included, and some particulars of the Bristol sandwich-system of training engineers are also given. The prospectus can be obtained from the registrar of the Merchant Venturers' Technical College, Bristol.

CAMBRIDGE.—Mr. W. S. Thatcher has been appointed Censor of the Non-Collegiate Students.

LEEDS.—With the view of encouraging the revival of the University Extension movement, the West Riding Education Committee has decided to make towards the cost of an approved course of extension lectures such a grant as will cover the actual deficit incurred, or 75 per cent. of the total expenditure, on condition that at least 30 persons undertake to enter for the whole course, and that the lectures are open to the public at a charge not exceeding 3*d.* per single lecture. The fees for lectures range from 2*l.* 10*s.* for a course of 6 to 76*l.* 10*s.* for 24, and the only other charges besides incidental local expenses, such as hire of hall and advertising, which are borne by the local committee, are the lecturer's travelling expenses and a fee of not less than two guineas (varying according to the number of candidates) for the examination, if one is held. The panel of lecturers includes 33 members of the University staff, of whom 8 are professors. The range of subjects

is very wide: the following are specimen headings—Greek ethics, archæology and architecture, phonetics, the Irish literary movement, social psychology, riches and poverty, Spanish art, How the Empire is governed, French history since 1815, the gases of the atmosphere, fresh-water biology, types of respiratory structure, the antiquity of man, radio-activity, application of colloid chemistry to industry, British birds, enzymes, bacteriology from the medical, public health, and chemical points of view, personal hygiene.

AN advisory chemist in the faculty of agriculture, University College, Reading, is shortly to be appointed. Particulars are obtainable from the Registrar of the College.

THE trustees of the Busk studentship in aeronautics, founded in memory of Edward Teshmaker Busk, who lost his life in 1914 while flying an experimental aeroplane, have appointed Mr. John Cowan Stevenson, of the University of Glasgow, to the vacant studentship.

A DEMONSTRATOR is required in the mathematics and mechanics department of the Royal College of Science, South Kensington. Candidates must possess engineering experience, and send their applications to the secretary of the college not later than September 5.

APPLICATIONS are invited by the Director of the School of Medicine, Cairo, for the professorships in the school, of Physics, Clinical Medicine, and Clinical Surgery; also for the post of lecturer in physics in the institution. In the latter case candidates must be of Egyptian nationality. Applications must reach the director by September 15 at latest.

APPLICATIONS are invited for the appointment of lecturer in physics and the directorship of the Viriamu Jones Physical Research Laboratory of the University College of South Wales and Monmouthshire. Applications (six in number) and testimonials must be received not later than September 10 by the Registrar of the College, Cathays Park, Cardiff.

THE University of Calcutta "Poverty problem study" organisation which has been at work for some years has succeeded in promoting the formation of a limited liability company for the establishment in the Paresnath Hills of co-operative educational colonies, such as Capt. Petavel, Principal of the Kassimbazar Institute, has been advocating in his university lectures on the "Poverty problem." The Company proposes to set up an agricultural college "where professors and students will be provided with sufficient land for self-support and education." Each student on completion of his course, and having obtained a university diploma, would be helped to acquire, as a member of a colony, a plot of ground with bungalow, well, bullocks, plough, etc. The scheme is described in the first number of a new periodical, "Bread and Freedom," edited by Capt. Petavel.

INTERCHANGE of teachers between universities within the Empire is one of the subjects that were discussed at the recent Imperial Education Conference in London organised by the League of the Empire. One speaker described as an object lesson to the universities of the Empire the Chicago University summer school, which attracts professors and lecturers from all parts of the United States as well as from abroad. We have lately received a University of Colorado Bulletin which gives an account of this University's summer quarter, extending from the middle of June to the end of August. This year the staff includes no less than fifty instructors from other