

GOVERNMENT-SPONSORED RESEARCH IN THE UNITED STATES

THE National Science Foundation's report* on Government-University Relationships in Federally Sponsored Scientific Research and Development includes a lucid summary of the evolution and present character of Federal activities at colleges and universities of the United States. It directs attention to three major trends since 1940, in which period Federal expenditure of some 15 million dollars a year on scientific research and development at colleges and universities has increased to 440 million dollars in the year ending June 30, 1958, probably two-thirds of the total. In this period Federal support has extended from the agricultural sciences to every field of natural science. Secondly, the period has seen the innovation and expansion of federally owned and financed research centres; and thirdly, in contrast to the relative absence of Federal 'extramural' financial support of research facilities, a significant part of Federal support (265 million dollars in 1957-58) goes for construction or operation of major research facilities. It is anticipated that the research and development activities of the Federal Government will continue to expand and that Federal support of basic research at colleges and universities will continue to increase. Reviewing the effect of Federal sponsorship, the Foundation concludes that while in the present situation research is necessarily given some direction by Federal agencies, this direction has not in general been irksome or detrimental, nor does the Foundation believe that the concentration of Federal funds in the natural sciences has deprived the social sciences and humanities of funds from other sources.

The major interest of the report lies in the principles and practices recommended for future Federal sponsorship. Generally, it is recommended that problems of Government-university relations in the

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Federal support of research at colleges and universities should be explicitly and completely dissociated from the budgetary needs and crises of the institutions, and from the general issue of Federal aid to higher education. It is also recommended that Federal funds for the support of such basic research at such institutions should continue to come from a diversity of Federal sources; the importance of simplicity of procedure in making contracts and grants, of promptness in negotiation and payment and of avoiding unilateral action is stressed, and further and continuing study of problems involved in such contracting is urged.

Federal agencies, it is recommended, should consider other alternatives before establishing large-scale applied and development projects within universities, except in certain fields such as engineering, agriculture and medicine, where applied research is frequently closely related to educational objectives. Government-sponsored classified research on college campuses should be reduced to a minimum, and Federal agencies should not agree to reimburse institutions for salaries of faculty members engaged in Government-sponsored research at rates in excess of the university-rate, though this should not apply to faculty members granted leave of absence to serve at research centres. Federal agencies should have legal authority to entitle institutions to research equipment procured with grant or contract funds unless a clear and definite need exists for Government control or use of the equipment. It is also recommended that Federal agencies should recognize as appropriate expenditure under research contracts or grants reasonable expenditure on travel to, and participation in, scientific meetings, and that such agencies should be authorized to make contracts or grants for more than one year at their discretion; they should also establish reserves and plan renewal of grants or contracts in advance, to ensure the continuity of support essential for the effective conduct of basic research.

SANDWICH COURSES

THE Association of Teachers in Technical Institutions, in a memorandum on sandwich courses*, which sets out its views on the best way to expand this form of education, objects to the distinction between area colleges and regional colleges in the policy of the Ministry of Education. It regards the virtual restriction of the establishment of new sandwich courses to colleges of advanced technology and regional colleges as too severe and, considering that works-based courses leave a large field uncovered, recommends wider provision for college-based students in Britain.

Informal as well as formal co-operation between employers and college staffs are most important, and at the works the trainee should be under the charge of a training officer or senior executive and also in

* Sandwich Courses. Pp. 13. (London: Association of Teachers in Technical Institutions, 1958.)

touch with a responsible member of the college staff. The importance of some flexibility in entrance requirements is also stressed, together with the need for active contact with secondary-school headmasters and teachers if students are to be secured. In regard to finance, the Association believes that during his periods of study, unless the firm is prepared to pay him adequate wages, the student should be maintained on the same basis as a full-time student, and it urges that parental income should be ignored in assessing grants.

The memorandum, in stressing the importance of staff of high quality, comments on the conditions of work, which are a continuing source of trouble. The Association urges that if 'end-on' sandwich courses in the same subject running consecutively in one year are essential to industry, they should be run in separate colleges. The Association also believes that

the sandwich-course method should be applied to commerce and management studies, and would like to see more pioneering experiments in a variety of fields made to guide development in years to come.

On April 29 the Minister of Education and the President of the Federation of British Industries launched a new effort to win greater financial support from local authorities for students taking advanced sandwich courses, of which there are some 200, with between 5,000 and 6,000 students. The target is 15,000–20,000 students, or as Mr. Geoffrey Lloyd said at a Press conference, half the technologists needed for British industry.

The Federation is recommending its member firms to pay the fees of employees who go to college and their salaries while they are there, and the Minister has issued a memorandum to local authorities, referring to firms which do not accept the Federation's advice, advising that sympathetic consideration should be given to applications for grants in such cases. It suggests that the award should cover the tuition fee in full, except where the income scale requires a parental contribution, and that earnings while the student is working should be ignored unless exceptional, as should an initial expenses allowance from the employer up to maximum of £100.

THE IMPERIAL INSTITUTE

THE provisions of the Commonwealth Institute Act of March 13, 1958, were explained by the Parliamentary Secretary to the Ministry of Education, Sir Edward Boyle, in moving the second reading of the Bill in the House of Commons in February. The Trustees of the Imperial Institute receive the necessary powers to erect a new building on a new site and thus to effect the move required in consequence of the decision to expand the Imperial College of Science and Technology on the South Kensington site.

Two minor changes are proposed in the constitution of the Institute as set up by the Imperial Institute Act, 1925: the Secretaries of State for Commonwealth Relations and the Colonies replace the Prime Minister, the Lord President of the Council and the President of the Board of Trade as trustees; and in the appointment of the private trustees, the Minister of Education, who is responsible, is no longer required to consult the Governor of the Bank of England and the President of the Association of British Chambers of Commerce. On the change of title to the Commonwealth Institute, Sir Edward Boyle said that the change is strongly recommended by the Governors of the Institute and has been agreed in principle by all those Commonwealth Governments which have replied. The responsible Minister is empowered to dispose of or lend any object for exhibition in the Commonwealth outside the United Kingdom.

Sir Edward said that the total annual attendance in the Exhibition Galleries is now about 500,000, including, in 1957, about 1,500 parties, totalling 42,600 teachers and children. The Institute has a panel of eighty lecturers, and in 1957 about 7,000 lectures were given to audiences of about 700,000, while thirty-six conferences for sixth-form pupils, teachers and training-college students were organized in provincial centres. The Commonwealth Students'

Club, founded in 1954, has now about 300 members and forms a useful supplement to the activities of the British Council, the Colonial Office and the Commonwealth Governments in London.

The Bill was generally welcomed in the House of Commons, tribute being freely paid to the work of the Institute in spreading knowledge and understanding and promoting sound race relations, keeping before the public the great ideals which the Commonwealth represents. Nevertheless, the need for more generous financial provision was strongly urged. In reply, Sir Edward Boyle pointed out that between 1954–55 and 1957–58 the grants-in-aid increased from £8,000 to £36,000. Sir Edward did not refer to the question of the Colcutt Tower except to say that since the report on the stability of the Tower as a free-standing campanile was satisfactory, it had been decided to plan the rectangular site in South Kensington on the assumption that the Tower would be retained.

Lord Lansdowne, moving the second reading of the Bill in the House of Lords on February 27, said that for the building of the Institute £413,000 had been subscribed from all over the Empire. For the new site of 3½ acres in Holland Park a capital payment of £215,000 had been made and there would be an annual rent of £10. The proposed building would have 125,000 sq. ft. of floor space. The present annual expenditure of the Institute is about £94,000, to which Commonwealth Governments contribute £12,000, the Exchequer £40,000 and the endowment fund £5,000. For the cost of the new building, £725,000 was proposed. In replying on the debate, he associated himself with what had been said by Lords Ogmores, Dundee and Tweedsmuir as to the importance of public understanding of the Commonwealth in Great Britain and the need for adequate and effective publicity.

BACTERIAL PROTOPLASTS

TREATMENT of *Bacillus megaterium* in certain media with lysozyme converts the rod-shaped cells into spherical units which are very sensitive to osmotic shock¹. These structures have been called 'protoplasts' and it has been established that the cell wall as identified microscopically, chemically, immunochemically, and by its reaction with bacteriophage, is entirely removed by the action of the enzyme^{2–4}. Similar, osmotically sensitive, spherical

forms can be prepared from other Gram-positive species by various techniques⁵. There is accumulating evidence that the cell wall is absent from such forms, although the whole of the cytoplasm is present, bounded by an osmotic barrier^{2a,b} and capable of most of the activities of the intact cell^{2c}.

It is useful to have the term 'protoplast' to describe such a structure, and the phrase 'protoplast membrane' to denote the envelope which surrounds it