

## The Maintenance of Scientific Research.<sup>1</sup>

By PROF. C. S. SHERRINGTON, Pres.R.S.

**B**BROADLY taken, the apparatus of prosecution of research in this country is made up as follows: (1) Scientific and professional societies and some institutions entirely privately supported; (2) universities and colleges, with their scientific departments; (3) institutions, using that term in the widest sense, directly subventioned by the State, such for instance as the Medical Research Council, the Development Commission, and the Department of Scientific and Industrial Research. Of these three categories, the first named, the scientific societies group, works without financial aid from the State, apart from the small though extremely useful two Government grants distributed, mainly to individual workers, through the Royal Society. At the present time many of the societies sorely need financial help to carry on their labours, and some are absolutely at a loss to know how to publish the scientific results that are brought to them. The second category, the universities and colleges, depends in part upon Government aid. In the aggregate of twenty-one institutions of university rank, following Vice-Chancellor Adami's figures, students' fees and endowment provide about 63.5 per cent. of the total income; for the rest they are dependent on Government grant. The third category, as said, draws State-support direct.

This triple system may seem a somewhat haphazard and inco-ordinate assembly. Yet in reality it is an organisation with much solidarity, and its co-ordination is becoming more assured. Its parts dovetail together. The first group, the scientific and professional societies, is provided with a medium of intercommunication and co-action, the Conjoint Board of Scientific Societies. As to the separate categories composing the triple system itself, they also are in wide touch one with another. Between the scientific and professional societies on one hand and the universities on the other, contact and inter-relation are secured by some degree of free and rightful overlap, both as regards general subject-matter of research and of their *personnel*. Finally, there is excellent contact between both these categories and the third, the State subventioned institutions. A special feature of the policy and administration of these State organisations secures this, a feature which makes the whole of this subject the more cognate to the purview of our own Society. To exemplify I may turn, for instance, to the Development Commission. Its programme of fishery research, avoiding the terms "pure" research and "applied" research in view of the possible implication that pure research does not lead to practical result, directs research not alone to the solving of particular economic problems. It supports more especially what it terms "free" research, investiga-

tion in this case of the fundamental science of the sea and of marine life.

Again, with the Advisory Council of Scientific and Industrial Research, its programme, gradually defined during the past six years, is laid down as having four main points: (1) the encouragement of the individual research worker, particularly in pure science; (2) the organisation of national industries into co-operative research associations; (3) the direction and co-ordination of research for national purposes; and (4) the aiding of suitable researches undertaken by scientific and professional societies and organisations. It recruits researchers by giving financial opportunity to promising students to be trained in research, attaching them to experienced researchers. In short, it apprentices to research a number of selected younger workers in universities, colleges, and other institutions scattered throughout the country.

So, similarly, the Medical Research Council. Its secretary, Sir Walter Fletcher, in an illuminating presidential address to Section I of the British Association meeting this summer, said, speaking of the nexus between scientific research and the progress of medicine, "It is the accumulating knowledge of the basal laws of life and of the living organism to which alone we can look for the sure establishment either of the study of disease or of the applied sciences of medicine."

It is evident, therefore, that, with a policy based on such principles as these, the third category in the triple system constituting the organisation for scientific research in this country is one which has common aim and solid touch with both the others, the universities and the scientific and professional societies. One sees in short that the organisation which has come into existence and is maintaining scientific research in this country is a real organisation. It did not spring fully equipped from the head of Zeus. It has grown up rather than been planned. In that respect it is an organisation essentially British, and it seems qualified to do its work for the country well. We hear of adventures, political and other, the offspring of the day. But these were no adventures, these, to my mind, welcome, long-overdue steps forward by the State toward the succour of science and its welfare, steps that help to strengthen and consolidate the organisation for research by such adjuncts as the Medical Research Council and the Department of Scientific and Industrial Research. One of the strengths of this organisation that has arisen is, in my view, that it interlocks with the educational system of the country. It is an organisation which proceeds on the wise premiss that, in the case of science, the best way to get the fruit is to cultivate the tree. It is an organisation which is

<sup>1</sup> From the presidential address delivered to the Royal Society at the anniversary meeting on November 30.

proving successful and economical. Its output has proved a more than liberal return on the funds at its disposal.

But essential to its continuance is continuance of adequate financial support from the Government. A tripod cannot stand upon two legs. The State-contribution in this country is relatively not large, but it is most important. Important as it has been in the past, it has now an importance most especially great. The cost of investigation is now higher, much higher than it has been. Endowment funds carry less far than they did carry. Private benefactions and voluntary generosity, although willing, are less able to be found and less capable at this time; already gauged as inadequate of themselves alone before the war, they obviously cannot alone cope with the necessary undertakings now. The present is a time when a large-scale withdrawal of the Government's financial support must prove most formidably crippling. Such crippling will be greater than the actual measure of the sum withdrawn would entail in ordinary times.

To pull down under emergency what has been built up through years of careful experience and is proving efficient can scarcely be ultimate economy. It is to unlearn a useful lesson learnt. Curtailment of the State aid—relatively small in this country—given to scientific research must harm the scientific production of the country. Some curtailment, however, at this time seems unavoidable. Though extension of buildings and equipment and *personnel* is wanted, it may be necessary to withhold that extension at this time, maintaining broadly the *status quo* ready for ex-

pansion when that is once more feasible. But if research be an indispensable factor in the rebuilding of the national life, sacrifices should not be required from it disproportionately greater than from other services of a similarly essential kind. Reduction of the State's support on a scale to entail ruin to the existent organisation would be a wastage rather than an economy. Calmly viewed, what more reminiscent of the wastage of the war itself than for machinery actually constructed, assembled, and producing what is needful for a nation's strength as a pillar in the industrial and intellectual temple of the world, to be now under temporary change abandoned or broken up; and at a time when industry as a whole stands convinced of scientific research as a necessity for its recovery and well-being.

My hope would be that scientific research on its present maintenance will be considered part of the intellectual bread of the community, part of the bed-rock on which rests the efficiency, not to speak of the industrial equipment, of the nation; that it will be treated as such in the measure of State-support continued to it; that the State will remember that that support has to embrace at least both the universities on one hand, and, on the other, the research institutions administered by the State, for this reason, namely, that the country's organisation for research, complex in origin, yet economical and effective, stands as an integral system to the entire existence of which is essential an adequate State provision for both these constituent elements, indispensable, since they are, to the whole structure of the system.

### The Rayleigh Memorial.

#### THE UNVEILING IN WESTMINSTER ABBEY.

THE history of the Rayleigh Memorial is soon told. Shortly after Lord Rayleigh's death in 1919 the desire was expressed by many of his friends to commemorate him in some suitable manner, and a committee was formed, with Sir J. J. Thomson, then president of the Royal Society, as chairman, to give effect to this wish. The committee contained representatives of the University of Cambridge, of which Lord Rayleigh was chancellor, as well as of the Royal Society.

After consideration it was decided that, subject to the permission of dean and chapter, a memorial tablet should be placed in Westminster Abbey, while his work at Cambridge as Cavendish professor should be commemorated by the promotion of research in some branch of science in which he was interested.

The dean and chapter gave a cordial assent to the wishes of the committee, and a position was chosen for the tablet on the north wall of the north transept close to the memorials to Sir Humphry Davy and Dr. Thomas Young. No space could be found near the group of medallions described in Commander E. C. Smith's interesting article in

NATURE of December 1 which form the memorials to Adams, Stokes, Hooker, Wallace, Darwin, Lister, and Joule, but Lord Rayleigh's work had close connection with that of both Young and Davy; much of it was a distinct outcome of the researches of Young, and the position selected is most suitable.

Lord Rayleigh's friends are greatly indebted to Prof. Derwent Wood, R.A., for the tablet shown in the accompanying illustration and especially for the very excellent likeness of Lord Rayleigh, their "unerring leader in the advancement of natural knowledge," which he has executed.

The ceremony on November 30 was a very simple one. A number of Lord Rayleigh's relatives and friends assembled in the Abbey and were met by the dean and Canon Barnes. After two short prayers the dean invited Sir Joseph Thomson, the chairman of the committee, to unveil the tablet. When this was done the memorial was dedicated by the dean and, as a tribute to Lord Rayleigh's work and position, an address, which is subjoined, was delivered by Sir Joseph. The ceremony was then closed with the Benediction.