

formed." There is much sanity in the reply of the Advisory Council to the criticism, actual or hypothetical, that much greater scientific results of value to industry would have been produced if the 1,000,000*l.* had been spent directly upon research done at the National Physical Laboratory and other research laboratories up and down the country. "Had the million been spent on research directed by the Government itself, its effect upon manufacturers would at the best have been destructive of their self-reliance, and at the worst a free gift to their competitors in other lands." We agree. Critics of this side of the Department's activities do not seem to recognise that to throw responsibility for research on the industries themselves is the surest way to educate the industries to appreciate the difficulty and the value of research.

A word may well be said here as to the statement in the report that at the end of the five years' period the research associations "must be prepared to continue without subvention from the State." The general principle is undoubtedly sound, and in the case of industries with large aggregations of capital there need be little fear that, having set their hands to the plough, they will turn back when the support of the State fails. For them the five years is probably a sufficient period. But there are industries, relatively small when measured either by the capital available or even by their production, which are, nevertheless, of vital importance to the State—"key" industries from their character rather than from their size. For these it may be necessary that State aid should be prolonged for more than the five years' period if, for them, the benefits of this research movement are to be consolidated and extended.

On the question of the conduct and co-ordination of national research the report truly observes that if the scheme for co-operative research in the several industries is to be a permanent success, provision must also be made for dealing with certain funda-

mental problems which are of such wide application that no single industry, however intelligent or highly organised, could hope to grapple with them effectively. The first of these basic problems is fuel. The Fuel Research Board was appointed in 1917 under the directorship of Sir George Beilby. A brief account of the activities of this Board is given. It includes such questions as "Gas Standards and the Development of the Gas Industry," "Peat as a Source of Fuel," "Pulverised Fuel," and problems of the production and utilisation of alcohol for power and traction purposes. Other instances of these "national researches" briefly reviewed in the report are the conservation of coal and mineral resources, the preservation of food, and the research into building materials and construction.

In the section dealing with the aiding of suitable researches undertaken by scientific and professional societies and organisations it is stated that grants have been made for the work on hard porcelain at the Stoke-on-Trent Central School of Science and Technology, that on glass technology at Sheffield University, and that on technical optics at the Imperial College of Science and Technology.

In concluding its short summary of the first five years' work the Advisory Council well says: "A longer period for review is specially necessary in our case, for research cannot be expected to produce results at short and regular intervals. Indeed, the expectation that it will is a misconception which has stood largely in the way of its consistent use by manufacturers, and has strained the patience of a public apt to think that the placing of an Act upon the Statute Book and the creation of a new organisation are all that is necessary to reach a desired end. If art is long in comparison with life, science, in spite of all its brilliant achievements, is longer still." That truth needs to be ever in the minds of those who deal with research.

The University of Birmingham.

ON Friday last, October 8, a number of influential representatives of Birmingham and the Midlands were the guests of the University of Birmingham at a luncheon in the Great Hall of the University at Edgbaston. The Chancellor (Lord Robert Cecil) presided, and the object of the gathering was to make known the need for increased financial assistance for the University.

Funds are urgently needed "to extinguish the debt of the University (130,000*l.*); to pay the staff of the University a living wage; to provide the necessary new accommodation and staff for the existing departments of science, arts, medicine, commerce, and education; to provide in all faculties facilities for research urgently needed in the public interest; to meet the greatly increased cost of administration and upkeep; and to enable the University to maintain its position among modern universities."

The Chancellor in calling upon Mr. Austen Chamberlain to speak welcomed him as one of the Members of Parliament for Birmingham, as Chancellor of the Exchequer, and more than all as the son of his father. Mr. Chamberlain, speaking first as a citizen of Birmingham, outlined the history of the civic expansion of the city in the days of his father, when the strenuous efforts of the leading men succeeded in making Birmingham a worthy metropolis of the Midlands, their work culminating in the foundation of the University. Speaking for the Government, he gave expression to the surprise with which they had learned the

extent to which the country had been dependent upon university learning for success in the Great War. Now he "would say to an audience drawn from a great business community centring in Birmingham that if such services can be rendered by university learning in war-time, is it not certain that those services are equally necessary to our prosperity as a nation, and the prosperity of this city and district, amidst the difficulties and developments which have followed on the restoration of peace? Upon the recognition as a great community of the national and civic importance of such an institution as the University depends the ability to hold our place among the cities of the kingdom and the Empire."

The Government was fully aware of the immense importance of universities, and ready to back its opinion of that importance. It had spent for many years immense sums on elementary education; it had spent considerable sums on secondary education; but all too little on university education. Mr. Chamberlain had undertaken, unless he was prevented by overwhelming financial reasons, to submit to Parliament for next year a grant of 1,500,000*l.*, and he had undertaken to consider—and though he could not promise, he hoped he might be able to do something in that direction—a further special non-recurrent grant in order to adapt the federated universities' scheme of pensions to the case of the older men who had joined and served the universities long before that scheme was in existence, and therefore on retirement would,

without extraneous aid, receive only the smallest pittance from it. He hoped the grant would be on that basis for a term of years. What the University of Birmingham would get out of this depended on Sir William M'Cormick's Committee, which would advise the Government. He attached great importance to the advice of that Committee on the administration of the grant. "The less Government interference the better. Whatever you do, don't sacrifice your independence; don't come to that condition, one of those which brought Germany to her ruin." Professors of universities must be independent men, free to express their individual thoughts, subject to such control as the Chancellor or the authorities of the University might think right to impose on them. He did not want direct Government control or interference; he did not want party "pull"; he did not want anything to govern the grant except the relative merits of the recipients. Therefore he attached great importance to the independent Committee of Sir William M'Cormick, which had secured the confidence of every University which it was called upon to examine, and had been a real friend and of real assistance to those universities.

The Government had laid down general lines for the guidance of that Committee. In the first place, it could not encourage any university to undertake new developments before it had made adequate provision for that which already existed. If any grants are expected in respect of new developments, it must approve these new developments as being suitable to the general scope of the university in which they are proposed. Moreover, the work done must be of university standard. Finally, the grant would depend on the amount of local support given by the city and the Midlands. "If the citizens of Birmingham, if the towns and counties round, do not care enough for their University, and all that it means to them, to give it adequate local support, then whatever the Member for West Birmingham might be allowed to say, the Chancellor of the Exchequer will tell you flatly that if you do not value your Midland University you cannot expect the taxpayer at large to pay for conveniences for you to which you yourselves will not contribute." He most earnestly hoped that the citizens of Birmingham, and the counties and boroughs which surrounded them, would co-operate to make the University a common source of learning and of wealth for them all.

The Principal (Mr. C. Grant Robertson) read a letter from the President of the Board of Education, who wished success to the appeal, and remarked that "all over the country we are faced with the paradox that while the nation has never derived more benefit from its universities, these institutions have never found it more difficult to carry on their existence."

Mr. Grant Robertson pointed out that 42 per cent. of the students of the University came from Birmingham itself, 42 per cent. from the region round about, and the remainder from distant parts, and he hoped that the surrounding districts would contribute accordingly; at present their contribution was not one-tenth of that given by the City of Birmingham. He emphasised the underpayment of the staff; he believed that there was not one of them who could not double his income by leaving the University at that moment. By what moral right did we expect gifted men to give services at a wage which in industry would be regarded as contemptible? Professors could no more be improvised than admirals or generals. Facilities for research were indispensable; a university in which research did not flourish was a crippled institution. There was, too, a growing and insistent demand for extra-mural work that ordinary men and women

might benefit. This demand must be met, but it could not be met without money. It was a most promising sign that the people were turning to the university to learn the duties and solve the problems of citizenship. They were asking for instruction in subjects which went to the root of civic life—history, political theory, economics, and civics—and by giving this instruction the universities would be doing much to make democracy safe for the world.

The problems of the present and near future were commonly called economic; they were really spiritual and moral, and they could not be solved by merely material remedies. We were victors in the war, and our universities might be made potent instruments in the spiritual, moral, and intellectual reconstruction of society. This might be an inauspicious time for an appeal, but the University was faced with a crisis; it must either act or succumb.

In the evening the Lord Mayor (Alderman William Cadbury) presided over a meeting in the Town Hall. Lord Robert Cecil made an eloquent appeal, showing the discreditable state of this country in the matter of university education as compared with the United States, with Germany, and, most of all, with Scotland. It was a curious fact that in England people seemed to think that anyone could use his mind without special training. This was a grave fallacy, and a university was essential to provide the necessary mental training which was so vital to us as a nation. With the increasing responsibility which was being thrust upon the people (in foreign politics, for example), it was of the utmost importance that the working classes should have full opportunities of receiving education, and especially university education.

Mr. Neville Chamberlain, M.P., appealed especially to the manufacturers, banks, insurance companies, and others dependent on industry for their money. He contrasted the business methods of forty years ago with those of the present, showing that to-day—when even directors are supposed to know something of the business they direct—a constant supply of highly trained young men such as the University of Birmingham can provide is an essential factor in the success of our national commerce. If it paid men to invest large sums of money in securing the raw materials of their business, it must pay them even more to invest a modest sum in maintaining the efficiency of an institution which turns out brains—quite as important as raw materials in the success of a business.

A resolution—"That this meeting, recognising the importance of the University of Birmingham in the commercial, intellectual, and social life of the Midlands, and convinced of its need for greatly enlarged funds, cordially supports the appeal now to be issued"—was carried unanimously.

At the close of the meeting the Pro-Vice-Chancellor (Alderman Clavton) announced that a sum of 200,000*l.* had been conditionally promised.

Aeronautics at the Science Museum, South Kensington.

THE collection of aeronautics in the Science Museum has been recently rearranged, and now occupies one of the galleries of the new Science Museum Buildings in Exhibition Road, South Kensington. Many important additions have been made to it, so that visitors can study the development of aeronautics from early times in the many objects of great historical interest, while the progress made in aviation during the last six years is represented by numerous exhibits which have been recently acquired.