

ence on the nature of any organization set up for civil research. Where the Broadsheet comes close to the heart of the problem is in its recognition that the National Economic Development Council must play a vital part in co-ordinating the national economic plan with which must be integrated the greatly extended and systematized programme of civil development contracts and 'ear-marked' grants, which it desiderates, and in its suggestion that the same council should be equipped for the purpose with a technical-economic arm.

This guidance of scientific effort is recognized as an integral part of the development of an effective national plan for economic growth, and the Broadsheet rightly recognizes that this will call for expenditure on a scale greater than the Treasury has ever envisaged for promoting civil defence. This is particularly true of information services, and here the Broadsheet lays the responsibility for initiative firmly on the Government side. Although in the long term the expansion of technical education will be the determining factor, in the short term only Government initiative will suffice to improve significantly the dissemination of relevant technical information to the scientifically backward firms—which still comprise a large section of British industry.

The Broadsheet looks favourably on the possibility of some considerable extension of the compulsory levy for research associations, perhaps jointly with a levy for industrial training, but it clearly recognizes that the present efforts of the Department of Scientific and Industrial Research in the information field are on nothing like the scale that is required. Whether the Department can fairly be expected to expand that effort on the necessary

scale is a matter for discussion. It is part of the larger problem of information and intelligence services generally, and while the Department persists in its policy of silence as to the activities of its Intelligence Division, any proposal to extend its responsibilities could well fail to command wide support.

What is perhaps most significant in the Broadsheet is this recognition that intelligence services have a vital part to play in the effective deployment of Britain's scientific and technological effort, and that the financial and other resources for such work must be found if there is not to be waste and overlap. That is a major point to be considered in planning the organization of Britain's effort in civil research. It should not be overlooked, however, that at present an essential part of library and information services of Britain—the public library services—are the responsibility of the Minister of Education, while the university libraries depend, through the University Grants Committee, on the Treasury and the colleges of technology on local education authorities or the Ministry of Education. The Broadsheet gives no lead as to the answers to these and other questions. Its examination of the research associations is likewise searching and inconclusive, but, like the debate in the House of Commons and the report from the Federation of British Industries, it asks many of the questions on which the Trend and the Robbins Committees have already reported. Decisions on such questions may be the easier for lively and informed discussion beforehand—discussion which should be at pains to ensure that no vital or important factors are overlooked or not considered when at last the decisions are taken.

## RESEARCH IN EDUCATION

THE annual report of the Nuffield Foundation for 1962-63\* is of particular interest for its emphasis on educational research. Almost £370,000 of some £1.8 million allocated during the year was for education, and while this includes £120,000 for a residential wing for New Hall, the recently established third women's college at Cambridge, and £77,000 for the new Shakespeare Centre at Stratford-upon-Avon, the remainder of this allocation is mainly for research. It is worthy of note in this connexion, moreover, in view of many public statements made during the year about the lack of financial support for scientific research in Britain, that the report pointedly states that there has been no increase in the number of applications received for grants by the Foundation in the various scientific fields with which it is concerned. Referring more specifically to complaints that insufficient help is available for particular research projects, the report reaffirms that the Foundation cannot act or play its activating part until it is brought into touch with able people whose promise commands its interest and support. Its recent experience indicates that there is no overwhelming evidence of large-scale neglect of worth-while projects and of people of ability who need financial help to carry out original research.

It is possible that such projects and such people may be unnoticed because some of those with good ideas are

hesitant in putting them forward for consideration by others, and the Foundation would warmly welcome suggestions for removing any obstacles to communication. It prefers, in fact, at times to discuss projects before they have reached their final form, and recognizes that a grant-giving body may sometimes be able to give encouragement and advice in the early stages of developing an idea into a practical project. Nevertheless, it inclines to the view of the Advisory Council on Scientific Policy that it is the central responsibility of research workers themselves to develop promising programmes of research.

This comment on the lack of evidence that promising projects and people are to any serious extent unable to find financial support appears to be true of educational research in general, in spite of the small scale of such research in Great Britain at present. The Minister of Education, Sir Edward Boyle, expressed the opinion in the House of Commons on July 24 that the difficulty lay rather in finding teams really capable of doing justice to the projects, and the proposals for establishing an Educational Research Council made to Sir Edward were partly stimulated by the need to train more research workers in this field. Meanwhile, the Nuffield Foundation's own contribution to educational research is proportionate to that of the Ministry of Education itself which, according to Sir Edward, is not expected to exceed £250,000 on completion of all the projects now in hand.

Sir Edward had more particularly in mind projects concerned with the schools curricula and examinations,

\* The Nuffield Foundation. Eighteenth Report, 1962-1963. Pp. xiii+192. (London: The Nuffield Foundation, 1963.) See also p. 526 of this issue of *Nature*.

and the Nuffield Foundation sees its own present programme for assisting the revision of school science curricula and the production of the range of teaching resources that the new aims and methods will require as expressing another of its roles—that of entrepreneur. The fact-finding enquiries, for which Sir Eric Ashby called in his presidential address to the British Association at Aberdeen (see *Nature*, 199, 835, 877; 1963), would seem to call for the exercise of yet a third function which has characterized the activities of the Foundation—enquiries aimed at social fact-finding and including the application of mathematical techniques to social problems. The Statistical Research Unit in Sociology at the University of Keele, for which the report notes an endowment grant, could well make important contributions in this field.

Meanwhile, the Nuffield Foundation has recognized that the widespread desire for the reform of school science teaching is well founded and important, and has brought together, in larger and more powerful teams than would otherwise have been possible, men and women, mostly school teachers of outstanding ability, who have the enthusiasm and ability to carry out the work. The projects for improving biology, chemistry and physics curricula for eleven- to sixteen-year-olds are well under way, and it is hoped that some of the preliminary material will be tried out in selected schools during the year that started in September 1963. Many schools have been extremely generous and helpful in seconding teachers to work full-time on the projects, and the Foundation fully recognizes the value of this co-operation from schools and education authorities, despite the great difficulties which such secondments have often caused them. The vigour and promise of these schemes derive largely from the general desire for such work to be done, and the report describes the result as one of the most exciting fields of action with which the Foundation has had the good fortune to be concerned.

One of two independent schemes which the Foundation is also supporting is that for improving the teaching of biology in schools, technical colleges and universities. A Joint Committee of the Royal Society and the Institute of Biology, of which Prof. W. O. James is chairman, is at present particularly concerned with the relation of sixth-form courses to university requirements, and, as a first step, in seeking to collect information on the probable future requirements of university departments and the capabilities of sixth-form teaching to meet them. The Committee also hopes to make recommendations on the degree to which standardization is desirable and to survey present biology courses in universities. An investigation along these lines is clearly of the type which Sir Eric Ashby himself had in mind and it would also be a valuable preliminary to any extension of the Foundation's biology project to sixth-form level. Accordingly, the Foundation has made a grant of £12,000 over two years. A guarantee of up to £10,000 over three years has also been made to the Royal Institute of Chemistry's new venture in founding a *Chemical Education Journal*, in view of its bearing on chemistry teaching at all levels.

The Foundation is also supporting several mathematics teaching programmes, but a major development of the year has been the increased support given to further the teaching of modern languages. This involves a project for preparing a full range of teaching resources for an introductory course in French for children between the ages of eight and thirteen. As in the science-teaching projects, the preparation will be done by practising

teachers under the leadership of a full-time organizer with the help of a consultative committee, and the project includes pupils' tests, teachers' guides, wall-charts and other audio-visual materials. It is linked with the Ministry of Education's pilot scheme in the teaching of French in primary schools to begin in September 1964.

Apart from this, the Foundation made several small individual grants to education committees and schools to assist them in producing or obtaining material to try out new methods of language teaching. It is also exploring with the training colleges, institutes of education and other bodies the possibilities for future development of new methods of training teachers, and has made a grant to the University of Durham for a factual survey of teacher-trainer, including the teaching staffs of all training colleges, and of all departments and institutes of education. In the same field comes the grant of £10,500 to the British Association for the Advancement of Science to assist the first three years of the Association's project for science lectures for staff and students of training colleges.

Only at a few points do these activities of the Nuffield Foundation touch the universities or provide the factual enquiries into university needs and teaching methods which Sir Eric Ashby urged on the British Association. Their indirect effect could, however, be considerable, and they demonstrate that there is a more considerable effort in educational research in Britain than Sir Eric's address suggests. A fuller picture is given in the appendixes to a report published last July on research into technical education. This report by a working party, of which Prof. A. V. Judges was chairman, and which was set up as a result of a conference at the University of London in July 1961, did not interpret its terms of reference too narrowly (see *Nature*, 199, 1240; 1963), and these appendixes provide a picture of educational research in progress affecting not simply the technical colleges or colleges of technology but also the university institutions.

This report once again insists on the need for more research workers, and this alone should help to draw the universities into this field. The working party's report, moreover, by implication rather than specifically, indicates how large is the field for educational research in the university field, including not merely the factual enquiries to which Sir Eric Ashby pointed, but also the room for experiment. This is all the more urgent if Britain is to make the most effective use of what is the real limit to expansion in higher education—in the supply of trained teachers. The Nuffield Foundation would not claim that what it is doing is more than pioneering or exploring some of the new and exciting possibilities. Its report manifestly points the way forward and, whether or not a Council for Educational Research is appointed, the major share of activity in this field cannot be left to a private Foundation. If not through a massive expansion of the National Foundation for Educational Research, as and when the programmes can be formulated and competent investigators found, then in other appropriate ways the Government must make available sufficient resources to meet the need. Whatever else the Robbins Committee has recommended, the expansion of higher education can only be undertaken on an efficient and economic basis when educational research has provided the answers to such questions as Sir Eric Ashby indicated and that effort should be a first priority.