

Unveiling British Defence Research

by our Parliamentary Correspondent

THE first investigation for many years of Britain's defence policy was resumed last week with the prompt re-appointment of the House of Commons Select Committee on Science and Technology. Although the committee is in theory supposed to be restricting itself to defence research, its terms of reference are written so widely that it will be able to cast a good deal of light on defence policy generally, something that the House of Commons has never previously been able to do. Although the possibility of a defence policy committee has often been discussed, natural conservatism and the feeling that defence is not the best subject for party differences have conspired to prevent its formation. Now Mr Arthur Palmer, chairman of the science and technology committee, hopes that his own committee will be able to get at defence policy through the back door.

It is, however, likely to be several months before the committee publishes its thoughts on the subject. The investigation is now about three quarters complete, and a report will probably be published "at the beginning of next year". After some 36 hearings, many of them in public and a number held at defence research establishments, the committee is about to start the process of sifting the evidence and drafting its report. Two sub-committees have been abroad, one to the United States and the other to Europe. Mr Palmer himself, with Mr Brian Parkyn and Sir Harry Legge-Bourke, went to the United States and had discussions at the Pentagon and at Sikorsky Helicopters and the MIT Laboratories at Lexington, among other places. Another sub-committee took a look at Europe, visiting NATO headquarters, Paris and Bonn, with a particular interest in collaborative research of a bilateral kind.

So far, there is no indication of the committee's thinking on the subject of defence research—indeed, it is probably too soon for firm views to have formed. But the committee would hardly feel it was doing its duty if it failed to identify faults in the way research is organized in Britain. It may feel, for example, that the government establishments take too large a share of the British research effort. At the moment, for reasons which are more a historical accident than deliberate policy, establishments carry out some 70 per cent of British defence research. The sub-committee which visited the United States must have seen that the situation there is rather different—almost the exact opposite, with only 30 per cent of defence research in government establishments. Although it would be surprising if the committee wanted to go as far as this, some change in the balance is almost certain to be recommended. But as experience with the Atomic Energy Authority has shown, it is very hard to make a change like this; government scientists, after all, are civil servants, with the security of tenure which that implies, and cannot simply be redeployed. The process is bound to be slow, and controlled by recruitment policy.

There are, too, varieties of defence research. The committee may draw a distinction between work of a kind which has no immediate industrial application (for instance, the work at the Underwater Research Establishment at Portland) and work on things like radar and electronics, which could now be done much more easily by industry. And it would be surprising if the chance was missed to criticize the elaborate committee system of the Ministry of Defence and the all-pervading influence of the Treasury. Although Mr Tam Dalyell, one of the firmest critics of the Treasury system, is no longer a member of the committee (having fallen from grace because of his indiscretions about Porton), the tone of some of the public sessions has suggested that other members also have their doubts about Treasury influence.

The committee will naturally continue to carry out major projects like the investigations into nuclear power and defence research, but another policy initiative it has taken may well be more significant. This is the decision to take up fields of more immediate interest for short-term investigation by a small sub-committee. The procedure here is for the general purposes sub-committee to make a preliminary investigation and report back to the whole committee. If there seems good reason for a deeper investigation, then a special sub-committee will be set up to deal with it. The first subject investigated by the general purposes committee has been the development of carbon fibre technology, now being undertaken in several British companies and government establishments. Criticisms of the rate of progress which appeared in the *Financial Times* sparked off the investigation. The first stage of the process is understood to be complete, and the general purposes committee is satisfied that a further investigation needs to be undertaken. A special sub-committee—said to consist of Mr Brian Parkyn, Mr Airey Neave, Mr Eric Lubbock and Mr Arnold Gregory—is to be set up to do the work. Meanwhile, the preliminary evidence is to be published without comment.

Now that it has established to its own satisfaction that an investigation needs to be done, the general purposes committee will begin work on the second of its projects, an investigation of fusion research at Culham Laboratory. Members of the select committee are not entirely convinced that the decision to reduce the scale of support for Culham was justified, and they will be calling on the Atomic Energy Authority to defend its decision. Recently, the prospects for controlled fusion have begun to look somewhat brighter. The third subject which the general purposes committee is prepared to look into is the British decision not to support the building of the CERN 300 GeV machine. At the same time, it is also responsible for following up the work on nuclear power, perhaps by calling on the Minister of Technology for a report on the progress he is making in reorganizing the nuclear power industry. Members of the committee have not been entirely satisfied with Mr Wedgwood Benn's performance so far.

Meanwhile, Mr Palmer is confident that his committee has become a fixture on the parliamentary scene. The fact that the Select Committee on Agriculture has been cut short in its investigations does not worry him greatly. This session the science and technology committee has been re-appointed in record time, a success which he puts down to a typical piece of House of Commons committee work. Apparently the chairmen of the various select committees have formed a liaison

committee, under the chairmanship of Mr John Boyd-Carpenter. As well as allocating funds to the various select committees (which saves a good deal of time and red tape) the liaison committee can bring pressure to bear on the Whips to get the select committees set up quickly. In the past, the Whips have often been dilatory, but now, with the liaison committee at their heels, they seem to have found new life. Clearly it takes a committee to beat the system.

Successful Research in Industry

INDUSTRIALISTS gathered at the Royal Society on November 19 to listen to representatives of some very successful companies talk about "Making a Success of Research in Industry". In this context, success of course means commercial success, as Professor M. J. Lighthill pointed out in his chairman's introduction, and the purpose of the day's deliberations was to discuss how a firm can best organize its research activities in the interests of commercial success. The meeting was organized by the society's *ad hoc* Committee on the Patent System and Patent Law.

Dr F. E. Jones of Mullard Ltd said that the proper place of research in industry is as part of a corporate plan formulated to ensure the long term viability of a company and involving everyone—in research, production, sales and so on—with responsibility for the success of the company. Research is vital to this plan; as well as market and operational research, and the development of new and better products, there is a strong case, at least in larger companies, for a programme of fundamental research. This provides a parallel to university research and helps to attract highly skilled young graduates who might otherwise be very difficult to recruit. Dr Jones said that ideally the research should be so fundamental that the young scientist does not realize that he has moved into industry. Later these recruits often realize that they are just as interested in the application of phenomena as in the phenomena themselves and may find other parts of the company's research programme more exciting than the purely fundamental work.

Mullard devotes a little over £0.5 million a year, one-third of its total expense on development, to fundamental research that has no immediate application and which is organized by the research workers themselves. The company finds many benefits besides the intake of bright young graduates who are drawn by the prospect of opportunities for pure research. Many of the patents obtained by Mullard come from its fundamental research projects.

The importance of integrating research into the other activities of the company was stressed by Dr J. G. Collingwood of Unilever Ltd, which represents what he calls multi-product marketing-oriented industry. The need for, and the size of, such a company's research effort depend principally on the sensitivity of products to technological change and the competitive position in the market. The efficiency of the research effort, once its size has been determined, depends not only on the controlled use of all research facilities, but also on a sound choice of projects and maximum speed in supply-

ing results. This requires close contact between research, production, marketing and other sections of the company.

Mr P. Docksey of British Petroleum Ltd talked about interrelations between petroleum research and company activities. BP deals with liaison between its operational and research and development departments by employing special coordinators. These are senior members of the research and development unit who are placed in the various operating departments where they are able to participate in day to day management. Coordinators are also in close contact with the leaders of research projects and are able to guide research along the lines most valuable to the operating departments. To carry out their liaison activities, coordinators need to be free from the immediate operating pressures of the departments concerned. They have no executive powers, but require remarkable characteristics; they must have a broad scientific background and a thorough knowledge of the company's operations and they must have worked at a senior level in experimental research.

The advantages of an interdisciplinary approach to research were argued by both Mr J. D. Rose of ICI and Dr M. Tishler of Merck, Sharpe and Dohme Ltd. Mr Rose illustrated ICI's debt to research with reference to the process for producing hydrogen for ammonia from naphtha, developed when coke was becoming too expensive to use, and the discovery of herbicidal properties of quaternary ammonium compounds, which has resulted in the production of such compounds as paraquat. In both cases all scientific disciplines were involved, and Mr Rose suggested that the best results are obtained from multidisciplinary teams formed to deal with special projects.

Dr Tishler said that in his pharmaceutical firm men and women from many different disciplines work together whenever necessary. He also stressed the importance of allowing the researchers freedom to solve problems in their own way, and to pursue interesting side issues. Top management needs to be patient with the research department; support must not flag in the more unproductive years. The senior research scientists at Merck have a considerable influence in the planning of research programmes from year to year, and Dr Tishler recommended that, like himself, scientists should be on the boards of companies. He also considered a collaborative relationship with universities—in terms of the interchange of personnel and ideas—to be very important to the health of industrial research.