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letter to Lord Bridges
29th October (filed 3)

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Government Support for Fundamental Nuclear Research

1. Certain aspects of fundamental nuclear research will continue for the foreseeable future to be so costly that substantial sums will be needed from public funds in support of particular projects, both for construction and for subsequent operation and use. At present these funds are channelled through three principal routes:
 - (1) Bodies such as the U.K.A.E.A., who engage in fundamental research as a minor but important part of their main programmes.
 - (2) The D.S.I.R., who finance special investigations by universities in association at present with the U.G.C. when additional buildings are required. The D.S.I.R.'s responsibilities are much wider than the provision of funds for major nuclear projects. They support university research in other fields, they award post-graduate grants and fellowships to individual workers in all scientific fields, and they give large numbers of relatively small grants in aid of nuclear research. The D.S.I.R. also finance work by universities at C.E.R.N., of which the United Kingdom is a Member State, and are responsible for British participation in C.E.R.N.'s own work.
 - (3) The National Institute for Research in Nuclear Science, who are empowered by their Royal Charter to engage in work in the nuclear field, in collaboration with universities and similar bodies. The Institute give direct support to universities in connection with research at the Institute's laboratories, and also for work at the universities in aid of the Institute's own programme.
2. This note is concerned with research by or in collaboration with universities, which must continue to be the main source of new fundamental knowledge if they are to perform their proper function, and is mainly concerned with major projects; the term "major" will need definition. It has long been a responsibility of the D.S.I.R. to support university research in the physical sciences, but the need for special provision for major projects in nuclear science led some years ago to British participation in C.E.R.N. and, more recently to the establishment of the National Institute. The Institute are inevitably involved in supporting university work in their own field, and to that extent they have already encroached upon the D.S.I.R.'s province, but this does not necessarily make a case for special treatment of all nuclear science. The D.S.I.R., in dealing with those aspects of nuclear science which do not need special provision, are able to help the universities to conduct balanced programmes in science generally.
3. The Government will, however, need to be advised on the nature and relative merits of major new facilities which should be provided, for adequate participation by British scientists in this field, before approving projects and budgets. Irrespective of the number of financial channels which remain open the Government will wish, as expenditure rises on constructing new facilities and operating existing ones, to arrive at a satisfactory overall budget for the field. The second most costly commitment at present is C.E.R.N., costing the U.K. about £1½ millions annually, exclusive of British university work at C.E.R.N., and financed through the D.S.I.R. The most costly is the Institute, engaged in the same field of high energy physics which is only one part (though the most costly one) of fundamental nuclear science. The fact that the Government may also need to seek advice on the overall balance between nuclear and other fields needing exceptional support seems only to strengthen the case for presenting advice on major projects in nuclear science through a single body authoritative in that field.

However, the juxtaposition of C.E.R.N. and the National Institute introduces a difficulty in this connection. C.E.R.N. is an international organisation and it is obviously proper for the D.S.I.R., as the most appropriate Government Department, to handle British participation in C.E.R.N.'s own work, which is a major project on any definition. Moreover it is convenient for the D.S.I.R., through its general responsibilities for supporting university work, to look after the needs of universities who wish to make use of C.E.R.N.'s facilities. Provision of these needs will be costly, and may well involve sizeable projects within the universities in preparation for work at C.E.R.N.

If a single advisory body is to be used, then either the Institute or the D.S.I.R. (or both) will suffer embarrassment in submitting their cases through that body. This can be lessened, but not eliminated, by proper consultative arrangements.

4. The advice offered to the Government on any research project must be based on the opinions and programmes of active research workers in the field and cannot be generated in a committee of manageable size, however eminent the members may be. The National Institute are well qualified to act as an advisory body in this field since, unlike the D.S.I.R., they are engaged in major programmes of research on their own account in close collaboration with the universities. They have, and will continue to have, the largest and most costly installations for fundamental nuclear research in the country; this is deeply involved in the reason for their existence. They must therefore have free access to the Government with applications for funds for their work, based on the advice of university research workers with whom they collaborate and whom they serve with the facilities which they operate. This advice is made available through the established Institute committees, and at working level through the Institute's research laboratories where their staff work side by side with those of the universities.

The marshalling of authoritative advice on general future major programmes in nuclear research would clearly be a natural and simple development.

5. In principle there is no reason why advice should not be presented through a single channel while finance passes through several, provided that proper consultative arrangements are made with the interested parties, but there may well be pressure to reduce the number of financial channels to one. For this reason, and also because the D.S.I.R. have certain well established duties towards universities which should not fall to the Institute, it may become important to devise rational definitions of "major projects" for both the advisory and financial activities. The research reactors are a case in point. Here the Institute marshalled the advice at a time when it was believed that large central Institute facilities might be needed, but they may or may not be asked to provide the finance now that the needs have been shown to be different. The financial issue will probably turn on the issue of technical Institute activity in the work.

The Institute is the obvious channel if the definition of a "major project" includes a need for functional as well as financial assistance to universities. In deciding who should finance a project, this would be a better criterion than either the sum of money needed or the number of universities involved.

6. Conclusions

1. There is a case for a single authoritative body to advise the Government on fundamental nuclear research, but this body should offer advice only on projects requiring special treatment, i.e. major projects. Other projects should be dealt with on a broader basis, as at present.

2. The definition of the term "major project" should include the requirement by the universities of technical assistance in design, construction and/or operation of the facilities proposed, and might include other provisos which need study.
3. It is impossible to exclude consideration of work connected with C.E.R.N. from the function of an advisory body in this field.
4. The advisory body should be the National Institute.
5. There is no reason in principle why financial responsibility should always reside with the advisory body but, if the Government decide to finance the work through one body, this function also should be restricted to major projects and might exclude C.E.R.N.'s work in Geneva as well as "minor" university projects directed towards C.E.R.N.

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