In the circumstances, it is in every interest that the real function of federal support for university science should be plainly recognized. For one thing, there would be less unseemly mumbo-jumbo when the hearings come round in Congress each year. For another, Congress would be compelled to recognize that sudden ups and downs in the scale of spending are impracticable, and that the science budget should somehow be linked with the expansion of the university system as a whole.

The consequences would be far-reaching though almost wholly laudable. One obvious step, for example, would be to increase the cash payments made directly to universities with PhD students on their books, at least to the point at which the salaries of university teachers are not dependent, directly or indirectly, on success in winning research contracts. The National Science Foundation is the obvious channel for this direct support for postgraduate science in the universities. One result might be that research grants were stripped of their overhead component, but nobody should be alarmed at that. Another would be the blunting of the edge of the competition for research contracts, often an unseemly business. Further, it would be easier than at present to encourage good postgraduate work outside the best universities.

But does not this imply some kind of strategy for the development of the universities? And how is the strategy to be decided? Congressmen will only be some of those who ask these questions. The sensible reply is that the National Science Foundation should be given the responsibility. If congressmen or scientists say that the foundation is not up to the job, something should be done to equip it for the task. Indeed, there are powerful arguments independent of those based on the need for continuity in university research which go against the orthodox view that the foundation's function should be to fill in the gaps in the pattern of research spending by other federal agencies. In present circumstances, it would be much better if the foundation were given responsibility for the whole spectrum of university research, leaving the specialized agencies the job of emphasizing their special interests. (There may also be a case for transferring to the Office of Education the curriculum developments which the foundation began.) If Congress really wants value for money, this is how to get it. And even though the obstacles in the way of such radical reform are plentiful, this is the direction in which Mr Nixon and his people should be pushing.

SCIENCE POLICY

Conservative Science

by our Parliamentary Correspondent

ABOUT two years ago, the British Conservative Party began to worry about its intellectual image—all the academics seemed to lean to the left—an impression which two more years of Labour Government has shown to be an optical illusion. Determined to improve their ratings on the campuses, the Conservatives began

to scour the universities for right-thinking academics. One result of this was a seminar, held last week, on science and technology policy. This occasion, as Mr Reginald Maudling reminded delegates in his introductory speech, was non-partisan in character—it would have been hard, indeed, for it to have been anything else, for the Conservatives have not yet devised themselves a science policy to argue about. (Mr David Price's paper on Science and Public Policy (see page 633), published this week, is a step in the right direction.)

The meeting was opened by Dr F. E. Jones, managing director of Mullard, Ltd, who set the scene with admirable clarity. Of Britain's total spending on research and development of £1,000 million, 10 per cent goes to basic research, 25 per cent to applied research and 65 per cent to development—figures which Dr Jones considered "about right". But the country was not getting good value for money, because research had become a money spender rather than a wealth creator. In order to ensure that as much effort was devoted to production and marketing as was devoted to research and development, the Ministry of Technology should be expanded to include the Department of Employment and Productivity and the Board of Trade. Not only Conservatives would be slightly alarmed at this prospect, but Dr Jones did produce one idea with a distinctly Tory ring; he urged that private industry should be allowed to do more research, by leaving more money in its pockets. To make sure that tax concessions were not used simply to boost profits, some form of control would have to be devised, but Dr Jones did not go into details. Other speakers also spoke with enthusiasm of the idea.

Mr Michael Hall, of the London School of Economics, offered the conference a re-interpretation of the manpower statistics collected by the Swan and Willis Jackson reports. They showed, he said, that, while industrial surveys indicated a three to one preference for technologists over scientists, the universities were producing graduates in exactly the inverse ratio. This "confidence trick on the young" meant that many were forced to emigrate. Those who stayed in Britain, Mr Hall said, "move from poverty to supertax without encountering affluence on the way". Professor M. L. McGlashan, from Exeter University, retorted that the universities were "fed up with being told what to do", and that the present Government's policy of restricting grants for postgraduate students would harm basic research, and force good students overseas.

After Viscount Caldecote had dealt with the problems of private industry, Lord Beeching did the same for the public sector. In effect, his paper dealt more with the problems of managing a public corporation than with science and technology policy, but he did define criteria for justifying research. The role of research, he said, was to overcome technical obstacles which had been identified; if there were no identifiable obstacles, there was no need to do any research—a situation, he implied, which had obtained at British Railways when he was chairman. "Government expenditure on research is a great sink into which manpower flows", he declared. The standard of living was not related "in any way" to the amount spent on research and development. Dr Sydney Jones of the British Railway Board denied that there were no technical obstacles—it was simply that people had failed to recognize them, he said.

The conference, of course, produced no ready made

science policy for the Conservative Party. Indeed, in the nature of things, the Conservatives are not very interested in giving away their plans in advance. Given the difficulties of policy making in opposition, when front bench spokesmen can easily become out of touch, the seminar fulfilled a useful purpose. At least it indicated that the difficulties of producing a policy for science and technology will not be spirited away by a change of government. That much, perhaps, is common ground between the parties.

POLITICS

Science All-Pervading

To coincide with its 1 day seminar on science policy, the Conservative Political Centre published this week a pamphlet which sets out its ideas on the organization of science. The pamphlet, *Science and Public Policy*, is written by Mr David Price, Shadow Minister of Science and Technology. Its message is that a Conservative Government should attempt to bring science into the formulation and execution of all policy—summed up in the phrase “Science in all policy rather than a policy for all science”. But Mr Price admits that to achieve this admirable state of affairs “the whole ethos of Whitehall must change”. “Neither the present machinery of Government nor those who operate it, whether politicians or civil servants, are wholly adequate to respond with understanding to the opportunities and to the problems thrown up by the advances of science and technology”.

Mr Price says that Government cannot be changed by reorganizing departmental responsibilities; it means persuading or compelling every Government department to use the techniques of scientific management.

The real problem of technology in Britain, as Mr Price identifies it, is that there is an “exploitation gap”. The responsibility for filling this gap he places firmly with British industry, which he says should try to copy the success of the great international corporations. All that the Government needs to do is to provide a climate in which risk capital is readily available. In effect, this rests on the assumption that a Conservative Government would be better at managing the economy than the present one.

There are, it is true, some further tasks which Mr Price assigns to central government, but a solution to the problem of changing personal attitudes towards science and technology, he believes, cannot be imposed from above. At the same time, he does not exempt members of parliament from the charge that they have ignored science. Mr Price says, “This alienation of working politicians from science and technology... has been unfortunate. It must end soon if our parliamentary democracy is not to end first”.

SPACE POLITICS

ELDO on the Block

from a Special Correspondent

Bonn, November 12

THE ELDO ministers' meeting on November 11, which acted as a curtain raiser to the main European Space Conference on the following three days in Bonn, was as

inconclusive as ever. The main issues were transferred to the European Space Conference itself. What is clear, however, is that the Europa rocket still has some life in it.

Two set pieces opened the meeting. One was the tabling of the Spacy Committee's proposals after its month's work since appointment on October 2 (see *Nature*, 220, 315; 1968). The document was not published but is concerned with an overall European space programme conducted within a single European space body. It is understood to call for very ambitious communications satellite projects, continuing well beyond the completion of the Europa I and II programme, and with a proportionately large price tag. The implications of this are far-reaching and complex and are likely to be overtaken by events at the main space conference. Even among the ELDO meeting's members—Britain apart—there were differences of view on how the launchers were to be produced and on the mode of management and control.

There was more progress on the other set piece—proposals put forward by the ELDO Secretariat on how to prune the current Europa I and II programme so as to avoid the threatened over-expenditure of \$100 million. The extra cost has been caused by the failure of the French second stage of the Europa launcher on both occasions it has so far flown. The *F7* flight from Woomera, scheduled for November 17, will be the third attempt and the first to aim for an orbit (employing a test satellite). The new plan cuts out two full test flights (*F10* from Woomera and a geostationary injection attempt from Guiana) and the last two development flights (*F11* and *12*) will fly without apogee motor. The Italians would lose substantial amounts of work by the revised arrangement, so the French and German Governments have offered Italy a share in the apogee motor development for their bilateral Symphonic communications satellite project. Another achievement was that the British delegation has at last persuaded ELDO's continental members that it is in good faith when it offers to supply Blue Streaks even when Britain has ceased to take an active part in ELDO, after 1971. “The terms are sufficient,” the meeting's chairman, Belgian Research Minister M. Lefevre laconically remarked to the members when the meeting finally broke up late on Monday evening.

A final communiqué in the form of a resolution was issued later. The British abstained from this, and the Italians agreed only if they could refer it back to their government. The main British objection, it appears, is to sweeping plans for further studies including work on a future programme, beyond 1971, which may involve a fair sum of money out of the current budget. It is expected that Britain will put forward a counter-proposal at the European Space Conference for the use of the substantial budget now going to ELDO for point to point communications satellite projects under ESRO auspices.

RADIO TELESCOPES

Bigger Still to Come

FOR some years after 1970, West Germany may be expected to have the largest fully steerable radio telescope in the world. A 100 metre (333 feet) instrument