

Protecting basic research

The US administration plans a generous science budget. It must not look for quick returns.

Curious things are happening at the National Science Foundation, where the ebullient Dr Edward Knapp took over as director a few weeks ago (see *Nature* 11 November, p.100). The good news, or at least the advance reports thereof, is that the federal government's budget for the year beginning next October, to be published when the new Congress has convened in January, will ask the Congress to approve a substantial increase in the foundation's budget by about 18 per cent, well above the rate of inflation (now down to 6 per cent). This development seems to be but a part of the Administration's determination that whatever happens in the next year or two ahead, basic research will not be starved of funds. The principle seems to be that while systematically ridding itself of obligations to carry through further technological demonstration projects — Clinch River is an exception — on the grounds that industry itself should pay for potentially money-making projects, the Administration appears to have acknowledged its own continuing responsibility towards basic research. Other agencies than the foundation, the National Institutes of Health in particular, will now be anxious to find out if the Administration's new-found generosity applies to them.

The other side of the same coin is that the Administration is looking for results — prosperity and all that — but results that it cannot yet clearly define. The argument seems to be that if the Administration has been so good as to agree with academic scientists that basic research is ultimately the wellspring of industrial innovation, and has written its cheques accordingly, it is perfectly within its rights to ask that innovations should flow thick and fast once the cheques are in the mail — and preferably before the next election twenty months or so from now. In the circumstances, it is understandable that Dr Knapp should have been advised to get rid of the three assistant directors whom he inherited (see *Nature* 16 December, p.567); the well known phenomenon that new brooms are rendered ineffectual by the tired servants who use them (to mix a mixed-up metaphor) is in this case complicated by the Administration's need to know who will be responsible for what befalls in the years ahead. The changing of the guard at the foundation is, as of now, politic and not political; Dr Knapp, supported strongly by his previous colleague at Los Alamos, Dr George Keyworth (now the President's adviser on science and technology at the White House), is promising to change the world, perhaps even to break the mould or shift the paradigm; those who will be writing the cheques in the fiscal years ahead want to know who should be blamed if Dr Knapp fails to deliver.

Knapp's prospectus is startling not merely because of the promises it makes on behalf of basic science as the fountain from which innovations spring but because it acknowledges that basic research is educative. Only two years after having offended almost everybody in sight by deleting from the foundation's budget those line-items concerned with the support of science education (in translation, the equivalent of curriculum development in the 1960s mould), the Administration is about to go to Congress saying that the National Science Foundation has a part to play in the education of scientists but this time at a professional level, perhaps by means of partnerships between industry and universities that will be sweetened by modest support from the National Science Foundation. Some of the schemes now being canvassed in Washington are not very different from those tried out in the past decade by the Science and Engineering Council in the United Kingdom. If that is how the budget indeed turns out, the consequence will be that even the next administration (due to be elected in 1984) will not know what to make of Dr Knapp's promises.

What follows is what is called normative or prescriptive advice. Understandably but also rightly, Knapp is impatient that so little (in the way of innovation) has been accomplished by so much expenditure. Among such people, impatience is a virtue. Academic scientists, the foundation's chief pensioners, are

almost wilfully indifferent to the needs of industry, their students obstinately persuaded that the academic life is best. A direct attack on these familiar conventions from somebody such as Knapp could help invigorate the system by means of which institutions of higher education train professional scientists. The result, with luck, could be not so much a spate of industrially relevant innovation as a modest cadre of able people. But none of these benefits would show up within what politicians would consider a reasonable time, and certainly not before the next election. More might be accomplished through the National Institutes of Health, which have at least a chance of understanding (not curing) cancer. So Dr Knapp must now keep talking (in public) about other people's opportunities in the hope that he will eventually be recognized as the man who made the National Science Foundation into what it should always have been — a low-budget agency with disproportionately large responsibilities.

Inventing the Wheel

The impending inquiry on nuclear power in Britain promises frustration.

Some years ago (to be precise, in 1972) the Central Electricity Generating Board, the only British public utility empowered to generate electricity for sale to commercial buyers, told a parliamentary committee of its hopes for the future of nuclear power generation. With electricity consumption increasing by seven per cent a year, or doubling every decade, and with the stagnation of coal output, it seemed natural enough that the board should rely for its future sources of energy on nuclear power and oil. (The last strand in the British fuel economy was cut in 1973, when the price of oil was multiplied by between three and four.) In 1972 the generating board was able, a little controversially, to announce that among the nuclear plants it planned to build would ideally be one fashioned on the principles laid down by engineers in the United States, in which the uranium fuel would be enriched to the extent of a few per cent in uranium-235 and in which heat would be carried away to steam generators by means of water under considerable pressure, perhaps 100 times that of the atmosphere. Next year, on 11 January 1983, a public inquiry will be opened in the country town of Sizewell in Suffolk so as to enable the British government to decide whether what is essentially a carbon copy of several hundreds of reactors built elsewhere should be built in Queen Elizabeth's fair isle. With a little luck, construction might begin fifteen years after the first intention was announced.

The inquiry is a public foolishness for which nobody can be excused. The chief culprit, however, is Mr Tony Benn, Minister of Energy in a previous British government who decreed that nothing should be done at Sizewell without a full inquiry. (The present British government weakly assumed Mr Benn's obligation at its election in 1979.) The Central Electricity Generating Board, which has steadfastly refused to confirm the obvious — that the inquiry is a waste of public money and a needless impost on electricity consumers — is almost as much to blame. For a single pressurized-water reactor is not in itself a hazard — and the best way of telling what the hazard would be if there were several such reactors is to build one of them in the first place.

None of this implies that the British government and the public monopolies that it franchises are neglectful of their duty; rather, the opposite is the truth. During the past three years, all those concerned have leaned over backwards to accommodate objectors to the proposed reactor, with the result that quaintly named organizations such as Friends of the Earth have taken to complaining that nobody will pay their expenses to travel in January from their headquarters (usually in London) to Suffolk (less than 100 miles away) to repeat the arguments for which they are already well-known. In much the same spirit might those used to the yoke or litter as a means of transporting heavy objects over uneven ground have petitioned the Roman Senate 2,000 years ago for funds with which to protest at the introduction of wheeled traffic on the newly paved roads.