

review of the navy projects. Something like eight per cent of the navy's research contracts were affected, accounting for something like four per cent of the total naval research budget. Among these programmes, he said, were some "where I feel there is a real possibility of usefulness to the navy in the future", that if this stringent criterion were indefinitely applied, "we could in the long run throw out some research efforts that we probably should have supported" and that Section 203 from last year's bill should not be perpetuated.

In much the same way, Lt-General Otto J. Glasser, Deputy Chief of Staff for Research and Development in the US Air Force, talked sadly of the way in which the total budget of the US Air Force for research and development had declined absolutely by 20 per cent in the past eight years and by nearly 50 per cent in real terms. Where universities are concerned, he thought that the defence research scientists have "borne the brunt of the reductions imposed by Congress in the past few years". In the coming year, the Air Force hopes to have \$78.3 million for basic research, of which \$33.9 million will find its way to universities. He explained that the air force was worried by demonstrations at universities against defence research on university campuses and that "we have taken steps to reduce classified research on campus, particularly where the classification has been imposed strictly because the principal investigator has access to security data".

Although the scientists of the Department of Defense seem to be solidly against the Mansfield amendment, their estimates of how much money is involved are much more modest than those provided by outsiders—the National Science Foundation, for example. According to Dr Foster, the review which has been carried out of basic research projects within the services which, in the current financial year, fall foul of the Mansfield amendment, work out at just over 400 in a total of 6,500. The air force and the navy are the services chiefly affected. According to Dr Foster's estimate, the total value of the disqualified projects works out at \$8.25 million out of a total sum of \$368.5 million made available by Congress in the current year. Dr Foster pointed out to the committee that the cost of the projects abandoned as a result of the Mansfield provision was much less than the \$64 million taken away from the budget request last year on the grounds of economy.

Just as the amount of money spent on basic research has been declining over the years, so has the total research and development budget for the Department of Defense as a whole. In 1969, the total expenditure was \$7.755 million, of which 3.1 per cent found its way into universities and 30.4 per cent into government laboratories. In the current financial year, research and development expenditure is planned at \$7,439 million, of which 3 per cent will be spent in universities and 31.8 per cent in government laboratories. If the budget request for the coming year is met in full, the total budget will be \$7,346 million, with 2.9 per cent spent in the universities and 31.5 per cent in government laboratories. Although these figures show that all sectors of the defence research and development complex have had less to spend as the years have gone by, it is ominous if unsurprising that when financial pressure is acute, the tendency to reduce extramural expenditure and increase that on internal research and development is enhanced.

Physicists in Protest

THE Spring Meeting of the American Institute of Physics seems to have been one of the largest of its kind for several years. Among many participants, however, the crisis in research funding occupied a good deal of attention and the American Physical Society, one of the constituent societies of the American Institute of Physics, took the unprecedented step of making the following statement about the shortage of money.

"In the past 25 years strong public support for scientific research has assisted this country to achieve preeminence in science and in its applications to industry and human welfare. Recent interruptions, uncertainties and cancellations of this support are now producing increasingly severe difficulties for American science. Within physics, every major field of research has been affected. The immediate consequences are severe: orderly programmes stopped, resources inefficiently used, many highly trained scientists suddenly unemployed. The long range effects will be even more serious, for productive research in physics cannot be turned off and on by the year. To recover ground lost by disruption of such work will cost far more, in the end, than to carry on an orderly programme.

"In the universities, research and the training of scientists are interdependent. Termination of research support cuts down the supply of scientists five to ten years later; it can affect the future even more profoundly by discouraging students at an early stage from seeking careers in science.

"Turning off fruitful research means fewer discoveries, fewer new ideas and slower progress in the technologies nourished by new scientific knowledge. Opportunities in physics are as challenging as ever. We can look forward to striking advances in our understanding of the fundamental laws of nature and to wider application of new physical knowledge to human welfare. Science has illuminated our world and applied science has given man opportunities for a better life. The problems we face as a nation call for more knowledge, not less; and better technology. Better technology must be based on more extensive understanding of scientific facts and possibilities.

"The emergency has received recognition in the Congress. Its implications have been plainly described in statements by the Committee on Science and Astronautics and its Subcommittee on Science, Research and Development. The action initiated by the Committee to augment the funding of the National Science Foundation is a significant step in the preservation of our vigorous national program in science. Other steps are needed.

"The health and development of science over the past 25 years has been an indispensable source of strength for the country. Present policies with respect to research and training will profoundly affect the nation's welfare and economy a decade or more from now."