

to become a deterrent. So, the argument goes, the ABM is needed to preserve the balance of power.

The chief flaw in that argument, according to many independent scientists, is that the Safeguard system simply will not be capable of protecting missile silos against massive attack by Soviet weapons. The original Nike-Sentinel project was abandoned essentially because it was thought to be too vulnerable to attack, yet the Safeguard system is based on similar hardware. Moreover, several witnesses before the Armed Services Committee brought up the possibility that if a sufficient number of Soviet missiles were unleashed at silos defended by Safeguard, all the anti-ballistic missiles would be used up and the silo would be left vulnerable. That argument depends in large measure on the ability of the Soviet Union to deploy sufficient numbers of offensive weapons not only to destroy defended missile silos, but also all the other silos operated by the United States.

The scientists' handling of the past debate on the effectiveness of the Safeguard system has, however, recently been called into question in a report published by the Operations Research Society of America (a report on which will be published in next week's issue of *Nature*), but in any case, the ABM was sold to the Senate this year chiefly as a bargaining chip in the SALT talks. The Armed Services Committee argued that "unilateral termination of the Safeguard programme would undermine the American negotiating posture and diminish rather than increase the likelihood of a successful and stabilizing agreement". The suggestion that the negotiating parties in Helsinki were close to agreement on anti-ballistic missiles before the session broke up last month gave more weight to the theory that to abandon construction of Safeguard at this stage would cut the ground from under the feet of Ambassador Gerald Smith, and, on the floor of the Senate at least, the viability of Safeguard took a back seat.

The negotiators in Helsinki were reportedly close to an agreement which would limit ABM deployment to 100 missiles for defence of either capital or of 300 ABMs to defend missile silos. The Soviet Union would be expected under the terms of such an agreement to complete its defence of Moscow by extending the Galosh system, and the United States would almost certainly extend the Safeguard defence of minute-man silos. The chief stumbling blocks, however, seem to be the number of ABMs to be allowed under the agreement, and also the fact that the United States has declared its unwillingness to enter into an agreement applying only to ABMs. The chief US objective at the talks is to use an agreement on

ABMs as a lever to halt development of the SS-9 and sea-launched MIRV missiles. Accord is reported to be close on the ABM agreement, and hopes are high that some agreement will be struck in the next phase of the talks to take place in Vienna.

SALT apart, however, the Administration seems to share some of the scepticism of critics of the Safeguard system, for in testimony before the armed services committee, Dr Foster admitted that "if enough SS-11s were sent against a defended Minuteman field, the interceptor supply could be exhausted and the radar could be destroyed". If the deployment of Soviet missiles continues at the rate of the past year, Pentagon officials admit that Safeguard will have to be augmented by an ABM system known as Hardsite. This system relies on a greater number of smaller radars and fast Sprint rockets than Safeguard, and is thought to be less susceptible to destruction. Final cost of Hardsite, although unknown, may turn out to be rather less than that of Safeguard (see box). With serious, unanswered questions about the technical viability of Safeguard, the Department of Defense is probably as anxious as anybody for an agreement at SALT that would stop the system from being fully deployed.

MANPOWER

Jobless Engineers

by our Washington Correspondent

ONE of the first studies of the job situation among scientists and engineers since this year's crop of graduates left the universities has given little room for optimism. The study, carried out by the National Science Foundation, has found that 3.0 per cent of the engineers in the United States are out of work, and the foundation believes that the correct figure could be nearer 3.4 per cent. Derived from a questionnaire mailed to 100,000 engineers in June, this estimate compares with a figure of 1.6 per cent in the summer of 1970, and with a national unemployment rate of 5.8 per cent.

The survey found that holders of master's degrees were the worst hit among those who had been through the universities, with 3.2 per cent of their number out of a job. Holders of the bachelor's degree reported a 2.8 per cent unemployment rate, while 1.9 per cent of PhDs were out of work. A slight consolation for those engineers who had been to university and yet found themselves in the dole queues is the fact that 4.4 per cent of the engineers who do not possess a degree of any kind were jobless in the summer.

An indication of the difficulties experienced by new graduates in finding a job after graduation is the fact that 5.5 per cent of the engineers under 25 years old were out of work—not far short of the national average—while those in the age group 55–64 fared only marginally better with 4.4 per cent of their number jobless.

Other findings of the survey include:

- 78 per cent of the out-of-work engineers replying to the questionnaire gave industry and business as their last employer.
- The unemployment rate for engineers employed in space research was running at 6.3 per cent and defence at 4.8 per cent, while those previously employed in public works only experienced an unemployment rate of 1.3 per cent.
- An indication that the situation seems unlikely to get much better in the near future is given by the finding that more than two per cent of the engineers currently employed said that they had been given notice that their jobs would come to an end before July 1, 1972.

The estimates in the NSF survey should be regarded as minima because they apply only to the engineers belonging to major engineering societies, who could be reached. The response rate to the questionnaire was 65 per cent.

Short Note

Detergents

WITNESSES ranging from William D. Ruckelshaus, Administrator of the Environmental Protection Agency, to Mayor Richard Daley of Chicago shared the billing for one day of hearings held by the Senate Subcommittee on the Environment on the Administration's recent announcement on phosphate detergents. The subcommittee was told that the Administration had not, in fact, given a blanket recommendation to the housewife to switch to high-phosphate detergents, but simply that she should examine the label on the detergent packaging and purchase the product that does not require a toxicity warning. Surgeon-General Jesse L. Steinfeld said, in answer to a question from William B. Spong, the committee chairman, that he had not considered submitting an environmental impact statement to the President's Council on Environmental Quality before making his recommendations concerning phosphate detergents. The National Environment Policy Act requires that all agencies of the federal government submit an environmental impact statement on any project likely to alter the environment in any way.