

meaningful". These show that unless the developed countries reduce their impact on the environment—by ending economic and population growth—so that the underdeveloped countries can catch up, the developed countries will be "reduced to fighting among themselves for what remains".

But, said Dr Davoll, it is difficult to convince growth-minded economists and technological enthusiasts that the Earth has inescapable environmental limits. "The rarely questioned assumptions of the virtues of technological expansion and a constantly rising Gross National Product emasculate the opposition, and the protests of those who do not regard these things as ends to be pursued, regardless of cost, sound thin and—most damning of all—unrealistic".

Engineers, because they are involved in the planning of projects, can make a significant contribution by looking beyond the short term interests. Quoting the example of the projected breeder reactors which "commits us to problems of radioactive waste disposal . . . for which no known solutions exist", Dr Davoll said that engineers, "like all of us, should ruthlessly question every assumption, and measure it against the problems of our real situation". Engineering and technology can be used, said Dr Davoll, as practical measures to achieve a generally desired aim, a smaller population living within the natural cycles of the Earth. Technology must not be pursued in the mystical belief that whatever can be done should be done.

SCIENCE RESEARCH COUNCIL

"Under Control"

THE Science Research Council this week unveiled a film that deals in some detail with one of the specific research fields which the council supports—control engineering. Sir Brian Flowers, chairman of the SRC, says that the film gives an insight into the way in which the council is helping to improve engineering education in universities, and collaboration between academic institutions and industry.

The SRC now funds about twenty control engineering groups at a cost, over the past five years, of about £2 million. Three of these—at the University of Manchester Institute of Science and Technology, the University of Cambridge and Imperial College, London—account for about £1.5 million of this, and are featured prominently in the film.

At Manchester, Professor H. H. Rosenbrock leads a group which has been concerned, for example, with the problem of properly controlling a diesel engine. And Professor J. F. Coales of the University of Cambridge describes in the film the way in which his group has been tackling problems of par-

ticular industrial interest—such as how to control the thickness of paper emerging from a paper mill, and how to optimize the output from an ammonia plant by accurately controlling the physical parameters of the ingoing material. The Department of Computing and Control at Imperial College, headed by Professor J. H. Westcott, has been closely associated with another large scale project involving the control of a cold steel rolling mill at the British Steel Corporation's Abbey Mill in Port Talbot.

Although plans are not yet complete, the SRC says that it will probably produce more films of a similar nature about other fields of research in which it has an interest.

EARTH RESOURCES

Skylarks for All

THE Skylark sounding rocket is Europe's most successful scientific rocket, with nearly 300 successful launches and with only a 13 per cent failure rate. Now, thanks to a suggestion put forward by the Argentine government, a new career for the rocket, as an Earth resources survey vehicle, seems to have been opened up. The first test of Skylark in this capacity was carried out from Woomera on March 27, and details of this flight were released this week.

Two cameras were used in this test, an f24 5½ inch aerial camera and a Hasselblad 70 mm camera; both black-and-white and false-colour photographs of southern Australia were obtained—and recovered—proving the practicality of the system. The emulsions

and filters used were chosen to provide immediate comparison with the Apollo 9 photographs which first demonstrated the value of satellites and rockets for general Earth resources studies. But the extreme flexibility of Skylark—it can carry a variety of payloads—means that any reasonably sized sensor, or up to six cameras, can be accommodated.

Professor R. A. G. Savigear, of the Department of Geography, University of Reading, described the use of sounding rockets from the viewpoint of a potential customer. Because areas of 500,000 km² can be covered on one flight, images of much more uniform quality than those built up from a mosaic of aerial photographs can be obtained; sounding rockets also have advantages over satellites, principally because they can be available just when and where required, and also because the payload is recovered.

Skylark is manufactured by the British Aircraft Corporation, and although it is not yet prepared to quote a price for an Earth resources version, it seems likely that for a complete operation the cost would be roughly similar to that of a scientific mission—of the order of £100,000. This would suggest a cost of £0.10 per km² for a general survey, which is much less than the £1 to £2 per km² required to carry out a similar survey with aircraft.

The resolution which can be obtained depends, of course, on the equipment used. Details 30 m across could be identified in photographs taken from about 200 km (higher, incidentally, than the Gemini orbital missions) but in practice a resolution of about 100 m will probably be sufficient.

HIGHER EDUCATION

More from Abroad

THE number of overseas students in British universities, technical colleges and colleges of education in 1970–71 was 34,564, according to the British Council (*Overseas Students in Britain, Statistical Supplement 1970–71*, £0.10). This is 11 per cent more than in 1969–70.

The Table shows the numbers of students from both Commonwealth and other foreign countries in 1969–70 and 1970–71. Of the 18,338 overseas students who were studying in universities in 1970–71, 5,413 (30 per cent)

were at the University of London, 1,278 at the University of Oxford, and 1,260 at the University of Manchester. Each of the remaining universities had fewer than 1,000 foreign students in 1970–71. But a larger proportion of the 15,712 foreign students in technical colleges—some 51 per cent—attended educational institutions in the London area that year.

The most popular fields of study among students from abroad in British universities are engineering, technology and applied science (4,564); social, administrative and business studies (3,803); and biological and physical sciences (3,271).

Numbers of Overseas Students in Britain (1970–71)

Origin	Universities		Technical colleges	Colleges of education
	Postgraduate	Undergraduate		
Commonwealth countries	5,137 (4,808)	3,843 (3,688)	10,273 (9,769)	417 (428)
Other countries	5,730 (4,991)	3,628 (3,453)	5,439 (4,686)	97 (76)

Numbers in parentheses are for 1969–70.