

reconnaissance. As Mr Wedgwood Benn announced in Parliament on March 20, "the objective is to establish whether there is evidence . . . to justify a subsequent more detailed investigation". The programme, which will cost £250,000 in all, is to survey areas selected by the institute as likely, on geochemical grounds, to contain uranium. This summer the survey teams were in the north of Scotland and the Midlands recording levels of radioactivity along roads and tracks by means of sodium iodide scintillation counters mounted on trucks, surveying rivers and streams on foot and collecting 1,500 water samples for neutron activation analysis. Although many of the data have still to be analysed, the first indications are apparently more or less as predicted. Until borings have been made, there is no knowing the concentration of uranium in the two areas in Scotland with appreciable levels of radioactivity, and the institute is unwilling to disclose the little it knows of the ore bearing rocks because that might reveal the sites and cause problems of one sort or another with landowners and others. As well as making a more thorough surface survey of these two sites in Scotland, the survey teams plan to look at the next two areas on the list next summer, the southern Scottish Uplands and South-West England.

Uranium ore was in fact mined in Cornwall at St Stephen at the turn of this century. Several tons of uranium, which occurs there together with lead ores in high grade veins, were sold to German glass makers who used it as a pigment for stained glass, and the same mine supplied some of the uranium ore used by the Curies as a source of radium, but by 1930 the mine was flooding and has never been worked since. All this, of course, was before the 1946 Atomic Energy Act; if the current surveys reveal commercially worthwhile amounts of uranium there will be the legal nicety of deciding who owns the mineral rights, the Government under the 1946 Act, or the owner of the traditional mineral rights.

MANPOWER

Labour at the MRC

IN a recent leading article on the Medical Research Council ("Medical Research Continued", *Nature*, 219, 426; 1968) it was stated that "One particularly disconcerting feature of the council's policy of direct labour is the way in which it may often leave middle-aged professionals high and dry without a job. One way and another, a great many people seem to be embarking on five year appointments with the council which run out at a time when it is usually too late for most people to begin an entirely new career". The MRC has now analysed its personnel records covering the five years 1963-68 and has submitted the following information. Limited appointments give job security for either three or five years. Unlimited appointments mean tenure.

Table 1. PROPORTION OF STAFF WITH LIMITED AND UNLIMITED APPOINTMENTS

Age	Limited	Unlimited	Per cent unlimited
Over 39	365	312	46
35	156	304	66
40	47	257	84.5
45	15	174	92
50	3	106	97
55	—	55	100

Fifty-one per cent of the staff, with at least three months service, in units that have been disbanded or reconstituted in the last five years stayed in the council's service. Of these, 15 people had unlimited appointments and 35 had limited appointments. The other 49 per cent, eight with unlimited and 40 with limited appointments, found other jobs chiefly in the universities and research foundations. Only two people were left with no job to go to immediately; both were in the 31-35 age group and held limited appointments.

Out of a total of 563 people who have left the council's service during the five years, 490 had limited and 73 unlimited appointments. Ten staff with limited appointments had no immediate employment to go to when they left the council's service; nine were over 30, four were over 35 and three were between 40 and 45. Ten other people may have been obliged to take unsuitable jobs—this category includes short term jobs, jobs in industry or abroad or jobs at a lower level of responsibility. All ten had limited MRC appointments, all were over 35, three were over 40 and one over 45.

BARRAGE BUILDING

Damming Morecambe Bay

THE possibility of a barrage across Morecambe Bay has moved one step forward with the announcement by the Water Resources Board that there appear to be no insuperable engineering difficulties, but this is not to say that plans for the barrage are cut and dried. Although a feasibility study of the proposal to use the bay as a reservoir has been in progress since February 1967, the full study will not be completed until the end of 1970 or even 1971, and only then will the Government be able to decide whether to go ahead with the scheme. Many will think it premature, therefore, to side either for or against the barrage, which is why some of the official bodies in the area are keeping quiet. There is, however, a growing number of objectors—local fishermen, trades people, representatives of amenity bodies and so on. Some of these hope that the feasibility study will come out against Morecambe Bay as the site for a barrage and that attention will be switched instead to the Solway Firth, on which there has already been a desk study and which is thought to be a much more practical and acceptable scheme.

Meanwhile, to allay the fears of local people, committed objectors or not, the Water Resources Board recently organized a meeting in Morecambe and at the same time issued a statement on the progress of the £500,000 feasibility study.

Some studies have already been completed. These include aerial and hydrographic surveys and contour maps of the bay. The subsurface investigations have involved a survey over about 22 miles on possible lines of embankment dams and the sinking and re-sealing of some 29 boreholes. At the Hydraulics Research Station at Wallingford, a large-scale model of the bay has been constructed, and surveys have been completed of current flows and the nature of the bed of the bay. Other studies in progress involve the Natural Environment Research Council, the Nature Conservancy and the Lancashire River Authority. Much remains to be done, including testing of the various possibilities on the hydraulic model.

Although the first purpose of the feasibility study is to evaluate a full scale barrage, the consulting engineers, Sir Alexander Gibb and Partners, are also investigating the possibility of an embankment dam or dams further up the estuaries of the Kent and Leven, and the development of pumped storage reservoirs in the inter-tidal areas. At the same time, the Water Resources Board has been directing a study of the present and future demands for water in the North of England and evaluating the possible sources of supply, other than a barrage or barrages, which could meet these demands. The results of this study are expected in 1969. The Economic Study Group of the North-West Economic Planning Council is also involved in the whole scheme. It is considering the wider economic and social effects of a barrage, and its conclusions will be incorporated with the results of the engineering studies in a comprehensive report by the board to the Government in 1971.

MILITARY TRAINING

Simulating Combat

A WELL-PLANNED but fictional tactical offensive was carried out by the staff of Ferranti Ltd in a display of its Action-Speed Tactical Trainer last Friday. The AS'TT, as it is called, is a computerized system designed to train personnel in naval tactics at the Command team level, and covers seaborne, airborne and submarine units.

The system comprises twenty cubicles, each of which can be programmed to represent any one of the three types of units. The whole operation is controlled from a monitoring room with special consoles for the instructional staff and screen displays for spectators. The parameters in the game are about one hundred "tracks" which may represent missiles, echoes, decoys or any other realistic device, and each cubicle is equipped with controls equivalent to those in either a plane, ship or submarine. Cubicles can detect each other according to their simulated roles—by radar or sonar, for example—taking into account such effects as jamming and earth curvature. The capabilities of each cubicle can be under either monitor or programme control, so that trainees feel under combat conditions.

One of the ironies, of course, of producing a military system of this nature is that although it is clearly cut out to be of great export potential—most countries like to train their military personnel cheaply and effectively—it is likely to be subject to a variety of political embargoes. Although not in itself an offensive weapon, it can make the use of offensive weapons more effective. This argument has already prevented the company selling computational facilities for military purposes to South Africa. Orders for over £2 million have, however, been received for the AS'TT from two NATO and two Commonwealth countries. It seems that the main demand will come from medium size navies.

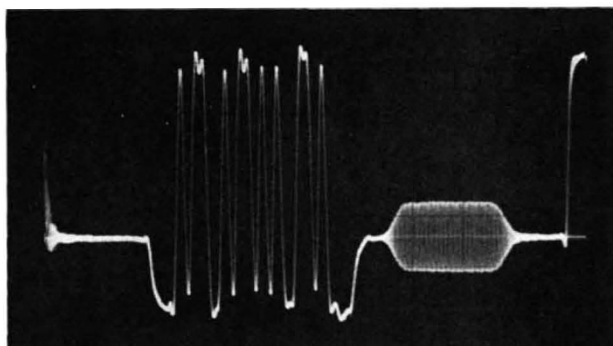
Ferranti also took the opportunity of exhibiting a new small computer—the FM1600 B. It was originally built for military uses, but its first sale was for air traffic control, and subsequent analyses have shown it to be suitable for several civil functions. Its small size is made possible by the use of microcircuits, and Ferranti claims that it is one quarter the size and has twice the computational power of the old F1600 model.

TELEVISION BROADCASTING

Sound in Vision

THE BBC gave a trial showing last week of a new method of transmitting the sound track in television programmes which it has called "sound in vision". A stimulating and elegant account of the system was presented by Mr E. R. Rout, head of the Electronics Group of the BBC Engineering Department, who managed to embellish the theory with a series of colourful field trials.

The theory underlying the new system is very straightforward. In present usage, sound and vision signals are dispatched separately by a network of GPO cable and radio links to the various transmitting stations in the United Kingdom. The sound in vision method, however, incorporates the sound signal into that of the picture—a feature which is made possible by the fact that the vision is not transmitted as a continuous signal. The sound transmission in fact occupies the circuit for 3.8 μ s of the 4.7 μ s line synchronizing interval, the remainder being used for vision. (The wave form is shown in the accompanying photograph.)



The mechanism of inserting the sound signals is by the use of pulse code modulation (PCM). Instead of inserting a continuous sound signal, the waveform is sampled at regular intervals and the resultants are coded into pulses and then added to the vision signal. A similar decoding process takes place at the receiving end, and a block diagram of the complete transmission system is shown.

It is, of course, essential that neither the sound nor the vision should suffer by this economy, and the BBC last week set up a series of demonstrations to allow this to be verified. The difference in quality between sending a piece of piano music to Scotland and back to London on the one hand, and round the lecture room on the other, was undetectable to an average observer, and the BBC claimed that the signal would stand two long British reference links with a margin of 12 dB with no impairment.

The present cost to the BBC of sound links for television is in the region of £75,000 a year, and although the cost of new equipment and its installation would initially outweigh the financial gain of introducing sound in vision, the BBC estimates that within three years the overall account should be out of the red. There is also a chance that other broadcasting authori-