

paradoxically been interpreted as a sign of a more promising French attitude to international collaboration. It is true that, because the minister did not attend, decisions that were to have been taken at the meeting at the end of June have now been postponed, presumably until October. But, with the change of government in France, many of the more poignant questions relating to the EEC are now in the melting pot. The council had only a brief discussion of the forty-seven projects in science and technology put forward by the Aigrain Committee as ripe for joint European initiatives, and it resolved to consider the report further and work out approaches for collaboration with countries outside the EEC on some future occasion.

The forty-seven projects fall under seven broad headings—telecommunications, transport, data processing, oceanography, metallurgy, pollution and meteorology. Two types of research activity are envisaged, some projects requiring a feasibility study and others immediate involvement. Countries outside the EEC will be invited officially to indicate their interest in individual projects after October 1, but some informal contacts, such as the approach to ICL on the design of a new very large computer, have already been made.

The feasibility study for building a very large computer to meet the needs of the nineteen-eighties has a very high priority, according to the Directorate-General for Research and Technology in Brussels. It is apparently not the intention of the EEC commission itself to undertake the research work in any of the projects, but rather to organize and coordinate the appropriate industries to do so. For the computer project, the commission has got in touch with five major companies in the EEC and left them the freedom to call in ICL if they wish. In this venture, the Aigrain Committee is clearly thinking in terms of exploiting new technologies rather than of building a "top of generation" computer.

It is conceded in Brussels that the machinery for handling many of the forty-seven projects is still very delicate. It is intended that the finance should be provided nationally, but that projects should be submitted to a coordinating system. The hope is that countries will be willing to forfeit doing their own research if they can be sure that external results will be communicated to them, although this is likely to prove easier in the social projects such as pollution research than in those with commercial overtones. In meteorology, the Aigrain Committee recommends investigating the setting up of a meteorological confederation for Europe, with joint measuring stations and satellites and facilities for developing materials appropriate to meteorology. A major feasibility study is also planned to assess the prospect of building a huge hovercraft—up to 2,000 tons.

CANCER RESEARCH

Who Pays the Piper?

A row is brewing about the financing of cancer research in Britain, and particularly the support for the Institute for Cancer Research in London, which includes the perhaps more widely known Chester Beatty Research Institute. An article in the *Lancet* last week implied

that the British Empire Cancer Campaign for Research, of which the institute is chief pensioner, spreads its £2 million too thinly over too many research groups. The Medical Research Council, which already supports the institute to the tune of £461,000 a year, was accused of taking advantage of the existence of the British Empire Campaign and the other cancer research charity, the Imperial Cancer Research Fund, to curtail the amount it spends on cancer research. Some of the more bitter criticism has been reserved for the Imperial Cancer Research Fund, which runs its own laboratories, spends no money outside them and last year was able to put £1.5 million in reserve while the institute ran up a debt of £200,000, thus eating away at some of the reserves apparently earmarked for a new building.

Unfortunately it is not simply a shortage of money that is eating the heart out of the institute, which gained its reputation a long time ago for work on chemical carcinogens. Just now it is affected by the inevitable uncertainties which accompany changes in directors, and which are always exacerbated when there is a delay in naming the new man. Sir Alexander Haddow has retired as director of the Chester Beatty Laboratories, the larger part of the institute, but so far there has been nothing but eloquent silence about his successor. So there is bound to be doubt of what will happen next. These uncertainties also make the financial situation even tighter than it might otherwise be, for the institute's chief benefactors are understandably not rushing in with more funds until they know who the new director is and what he plans to do. By contrast, of course, the Imperial Cancer Research Fund has not only plenty of money but a new director and an apparently settled future.

Most of the arguments now in the air are familiar stalking horses. The Medical Research Council has increased its total spending on cancer research from £1.18 million in 1965–66 to £1.43 million in 1967–68, the latest year for which figures are available, and the share of the Institute for Cancer Research has risen accordingly from £382,000 in 1966–67 to £461,000 in 1969–70. Indeed, the MRC block grant has a built-in 6 per cent increment per annum for the quinquennium. So long as the MRC is expected to finance such subjects as molecular biology and biophysics, which should come under the umbrella of the SRC, as well as medical research proper, cancer research cannot justifiably expect to receive a greater proportion of the MRC's total budget than at present.

But what of the Imperial Cancer Research Fund's supposedly overflowing coffers? The fund is currently embarking on an expansion programme involving building a further 52,000 square feet of laboratory space and recruiting about seventy scientific staff. The cost of the new laboratory, which should become just the sort of concentrated large research centre enjoying the economies of scale for which people are asking, will cost about £1,750,000 to build and equip and will roughly double the fund's annual running costs from £800,000 to about £1.5 million. That seems to be one reason why the fund needs to build up its apparent surplus. Another reason why the fund must have a large invested reserve is that it is entirely dependent on charity. It receives no money whatsoever from the MRC or any other government agency. In order to earn the odd £450,000 that the Institute for Cancer Research receives from the MRC, the fund would need

to invest about £8 million, and to earn the further £250,000 that the institute receives from the BECCR the fund needs about another £4 million in investments. Clearly if the fund were to spend to the hilt, its future would be as full of uncertainty as that of the institute.

The management of the institute is the first to admit that the arguments in the *Lancet* are unlikely to serve any useful purpose, and Lord Halsbury, the chairman of the management committee, has apparently sent a letter to the *Lancet* dissociating the institute from the arguments which boil down to a superficial attack on the MRC, the BECCR and above all the ICRF, which seems to have been singled out for criticism because of its success. A more fruitful line of thought is not where the money for cancer research is to come from or how it is to be distributed but what constitutes cancer research; the real shortage is not money but ideas and talented scientists, as the MRC, the ICRF and the institute know only too well.

HOVERTRAINS

Not on the Rails

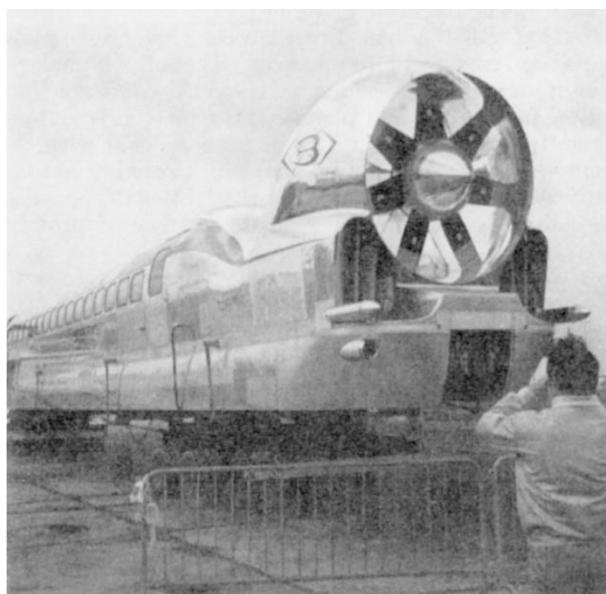
FRENCH enterprise promises to have the first operational tracked hovercraft on the rails this year. What can only be called (in the circumstances) the "glide-out" of a full-scale eighty-passenger hovercar took place at Le Bourget airfield outside Paris on Monday (July 7). It will start tests on a 5 mile stretch of elevated track already complete near Orleans, which in due course will be extended to cross the 70 miles which separate Orleans and Paris. By the end of the summer, the test section of track will be 11 miles long and a public demonstration of the eighty-passenger hovercar running on it is expected in September.

The concept of France's first "aérotrain" derives from the work of Jean Bertin, polytechnician. It is being promoted by a company, Société de l'Aérotrain, formed 3 years ago to pursue this application of the hovercraft principle (French *aéroglesseur*). Another, SEDAM, is concerned with marine applications and is operating a Bertin hover-ferry, the Naviplane, for its first season, on the Riviera. The first man-carrying Bertin craft to be built, the Terraplane, was a clumsy looking bus-like affair. It had wheels as well as a series of cellular air cushions. The cellular approach has survived in the Naviplane which has eight—four down each side which inflate and deflate sequentially so that take off and landing are performed very much in the manner of a camel.

The chief effort has, however, gone into the aérotrain, which has been generously blessed by the French Government. A considerable body of data and experience has been accumulated with passenger carrying half-scale test vehicles operating on a 4 mile stretch of experimental monorail on a hilltop at Gometz, about 30 miles outside Paris. The track goes "from nowhere to nowhere" (as one of the engineers remarked), but the most recent of the test cars has reached 215 m.p.h. with a rocket attachment and all regularly cruise at 150 m.p.h. which is achieved in about 30 seconds. They are surprisingly quiet and smooth though seat-belts are provided. Different types of prime mover have been tried out: gas turbine jet; propeller drive; and a second stretch of track is now being built for operation with a linear electric motor.

The track is in the form of a reversed T with the projecting member on which the car is slotted rising 2 feet high. This will be increased to 3 feet for the inter-city high-speed system of which the Orleans-Paris route is the prototype.

The eighty-passenger inter-city hovercar now ready is intended to cruise at 155 m.p.h. It is constructed of aluminium and weighs 20 tonnes all up. It is driven by a specially designed and shrouded propeller mounted on the tail which is powered by two turbo-jet engines each developing 1,300 h.p. A separate power system also employing a turbo-jet engine (720 h.p.) produces the air cushion via fans. The vehicle is 26 metres long and 3.2 m wide and stands 3.3 m high apart from the



propeller. A retractable wheel front and back enables the car to turn round under its own power when off the track.

Work on tracked hovercraft has been going on since the Hythe hovercraft development unit was set up by NRDC nearly 10 years ago. It has, however, only blossomed since that section of the unit was decoupled from Hythe and set up last year at Cambridge as an independent firm with £2 million of development capital. It will not be until well into 1970, however, that a passenger-carrying hovercar will be running on the Cambridgeshire test track. Most of the delays seem to centre on the track for which an 18-mile-long site on the banks of a fenland drainage channel was chosen nearly 2 years ago. Building has not yet started. On the other hand, official encouragement and the provision by the French Transport Ministry of most of the capital costs of aérotrain installation is a powerful incentive to entrepreneurs on the other side of the Channel.

INDUSTRIAL RESEARCH

BISRA in Business

THROUGH all the changes the British steel industry has seen since nationalization—and is about to see in the proposed new regional reorganization—the British