

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

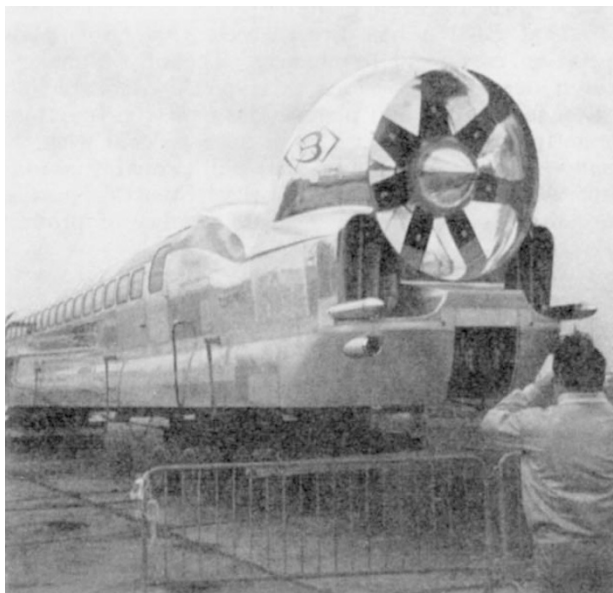
FRENCH enterprise promises to have the first operational tracked hovercraft on the rails this year. What can only be called (in the circumstances) the "glide-out" of a full-scale eighty-passenger hovercar took place at Le Bourget airfield outside Paris on Monday (July 7). It will start tests on a 5 mile 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