prospective buyer. Work on the smaller SRN6 and the 40 ton BH7 will be transferred to the company's main plant at Cowes.

GEODESY

Life without Echos

GEODESISTS are finding it hard going without the once familiar glow of the Echo satellites to illuminate their triangulations. Echo 1 re-entered the atmosphere on May 24, 1968, and Echo 2 followed a fraction more than a year later on June 7, 1969. During their lifetimes the Echo satellites—strongly reflecting balloons 41 metres in diameter—became well known around the world and, even, it is rumoured, venerated as gods in the African bush. With apparent magnitudes on the stellar scale of about 2·5, the satellites could easily be detected by the small cameras of the Western Europe satellite triangulation programme. (The larger the magnitude number the fainter is the object, and the limit for the eye is about magnitude six.) The aim of the programme is to obtain accurate locations for a number of stations in Europe relative to each other by photographing satellites against the background of stars. Geodesists are now having to make do with less bright satellites, and the situation was discussed at the Royal Society last week in a meeting of a subcommission of the International Association of Geodesy which deals with observations of artificial satellites from Western Europe.

As well as pressing for a third Echo satellite, the meeting appears to have backed another horse: the provision of more cameras able to track the faint satellites. Two of the balloon satellites which are at present being used for the programme—Explorers 19 and 39—are frequently too faint for the majority of European cameras. Last year's meeting of the subcommission in Paris initiated a test programme of observations of Explorer 39 beginning in May last year, and so far it appears that only five European countries have been able to obtain successful photographs. The reason is that the Explorer 39 balloon is only a few metres in diameter and that it is in an elliptical orbit so that its brightness, at best of magnitude 3·7, is variable.

A third balloon, the Pageos satellite consisting of a 30 metre diameter balloon of aluminized Mylar, is more easily visible at magnitude 1·6, but its orbit at a height of 4,000 km is less good for triangulation work over short European baselines than satellites at lower altitudes.

The subcommission is also looking forward to the launch of further satellites equipped with reflectors so that the more precise technique of laser ranging can be used. The next satellite in the series is Geos-C, expected to be launched in 1972, and the subcommission wants to see the laser method developed and used at European stations. At present satellite triangulation methods are giving accuracies in position of the order of 30 metres, less accurate than classical methods, but the hope is to improve the accuracy to about 3 metres using the standard photographic method, and to less than one metre using lasers.

But the subcommission is still hopeful of seeing another balloon satellite of the Echo type in a low altitude orbit, especially now that more countries are joining the programme with less powerful cameras.

Thirteen countries are participating in the triangulation programme with more than thirty cameras. In Britain, stations are at Malvern, operated by the Ordnance Survey, and at Earlyburn, near Edinburgh, operated by the Royal Observatory, Edinburgh. Both stations have successfully photographed Explorer 39 down to fainter than magnitude seven.

PRIVATE RESEARCH

Arthur D. Little's New Name

IN the long run the government's plan to set up a British Research and Development Corporation out of a handful of the research and development organizations of the Ministry of Technology may help the independent research institutes, according to Dr F. Neville Woodward, director of Inveresk Research International. Inveresk Research International is the new name for the Arthur D. Little Research Institute which has been operating since 1956 in laboratories near Edinburgh as an offshoot of Arthur D. Little Inc., of Cambridge, Massachusetts. The change comes about because the institute has bought out its financial involvement with the parent to become a wholly British-owned organization.

Announcing this in London last week, Dr Woodward said that the independent research institutes in Britain have nothing to fear if the proposed British Research and Development Corporation is set up. Although the corporation will be competing with the independent institutes for contract work from industry, Dr Woodward thought that in the long term the encouragement of sponsored research would be a good thing. The government plan, already criticized from several quarters, is that by 1975 the proposed corporation will be self-supporting with payments for work being done for industry accounting for one-third of the annual costs. Based on the Ministry of Technology estimates, this means that the present £10 million per annum earnings from industry by the government organizations involved in the plan will have to be doubled by 1975.

At present, Dr Woodward said, "the government is moving heaven and earth to find work for its employees in laboratories which we think ought to be run down". This is one of the reasons why Inveresk Research International, which specializes in pharmacology, polymers, membrane technology and organic semiconductors, now has no contracts with government departments. But Dr Woodward also said that the staff of the institute are not enthusiastic about taking on government work because the negotiations are frequently "painfully slow", and because the institute is often not told what becomes of the work which they have done. "It's like working in a vacuum," Dr Woodward said, "so we are far less enthusiastic about government work than we were in the past." In fact, roughly half of the income of Inveresk Research International comes from the pharmaceutical industry and twenty per cent of its work is for companies outside Britain.