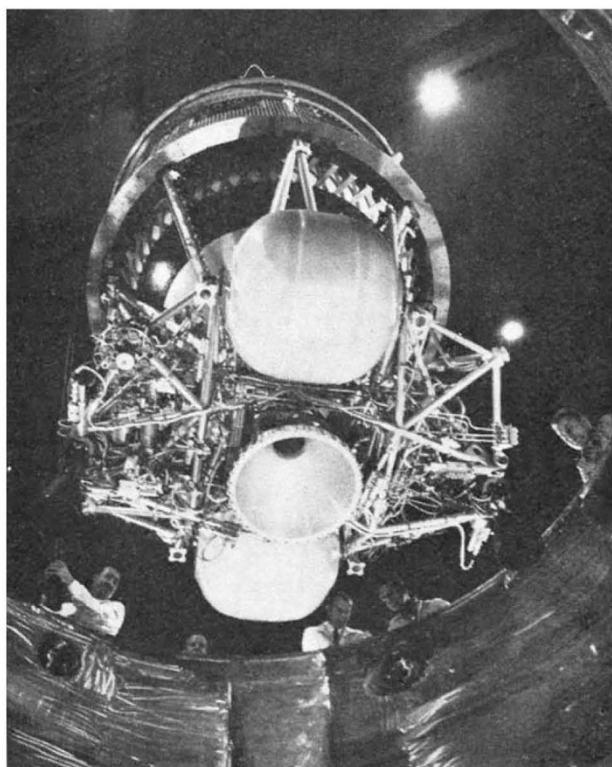


\$1 million. It is assumed that the budget for the studies will now have to be \$800,000.

The failure last Saturday of the first "live" test of the complete Europa 1 launcher may in the end prove crucial to the ELDO concept. It has surely shaken the confidence of all but the most fanatical of European rocketeers. How much the failure will cost ELDO in time and money is still not clear. But it will certainly push the costs of the ELDO programme above the fixed ceiling of \$620 million by 1972, a development already threatened by failures of the French second stage in the previous two tests and only avoided by the drastic cuts affecting the Italians recommended by the ELDO ministers on the eve of the European Space



The German third stage.

Conference in Bonn. Not only did the German third stage cut out early, but the Italian test satellite was lost in last Saturday's firing. "We don't know where it is," Colonel J. Dutton, an ELDO representative, is reported as saying. The test, known as F7, was originally to have been last summer. A postponement from the rescheduled launch date of November 18 was due to trouble with the standby French stage sequencer—it was the second stage sequencer which failed during the most recent test of Europa 1 a year ago. Further attempts at launching took place on November 23, 25, 27 and 28. The first of these was abandoned about three hours before the end of the countdown because of premature ejection of the umbilical plug from the German third stage, the second was abandoned 35 seconds before lift-off when a fault developed in the arming of the separation motor of the French second stage, the third countdown was stopped an hour before lift-off because of a fault in the pressurization of the second stage, and the fourth attempt was stopped due to a false indication of an engine fault in one of the

first stage engines. In the end, on November 30, the French stage and its sequencer triumphed and much hard work was vindicated. But the launch was a blow for the Germans and the expensive third stage, by far the biggest space project in the Federal Republic. Only recently the Federal Minister of Scientific Research, Dr G. Stoltenberg, said the major problems facing ELDO were not in the third stage, and everyone is hoping he will be proved right. Paradoxically, the British booster has come through clear all along. Blue Streak has now made eight successful firings out of eight.

It must be admitted, however, that by comparison with some of ELDO's earlier efforts, this latest launch was almost a success. All three stages fired, at least, even if one of them cut out before it should have done. By ELDO standards, this is far from bad. It is only when this partial failure is added to the previous disasters with the second stage that the full effect can be realized. By going ahead with the orbital attempt instead of repeating the earlier firings until they were successful, ELDO took a calculated risk, which very nearly came off.

CONSERVATION

Aldabra all but Saved

To judge from the Royal Society's report of council (published last week) and Professor P. M. S. Blackett's presidential address, all that stands in the way of immediately establishing a permanent research station on Aldabra and maintaining the island as a nature reserve is a lack of funds. The chances are that money will be made available from the current negotiations between the Royal Society and the British Government on the one hand and the US National Academy of Sciences and the Smithsonian Institute on the other. Professor Blackett was able to say last week that "because of the several interests involved in the island, negotiations to seek the establishment of a permanent research station have necessarily been protracted, but the final stage seems now to be in sight".

The Aldabra Research Committee, with Professor T. S. Westoll as chairman, has maintained groups of scientists on the island during the negotiations for a permanent station. Phase six of the Royal Society's Expedition sailed for the island this week. The group, led by Dr D. J. Bellamy of the University of Durham, plans to stay on the island until the middle of next February studying the offshore under-water marine ecology. It will take over from a group of shallow water marine biologists which has been on the island for the past four months studying the littoral ecology. By February plans for a permanent station should have been decided.

The research committee has held talks with the Governor of the Seychelles who, as Commissioner of the British Indian Ocean Territory, is responsible for Aldabra. The Governor has apparently offered the fullest cooperation, so there are no local difficulties still to be overcome. All that remains to be done is to raise some money. How much is involved? With negotiations still in progress, nobody is willing to say exactly how much the Royal Society is hoping to raise, but the capital cost of the station is likely to be about £40,000 and the annual costs thereafter about the same. With luck the society should have secured this before

it holds a discussion meeting on the expedition, scheduled for early next year.

TRANSPORT

Slide to Work

THAT old staple of science fiction writers, rapidly moving pavements for carrying people around cities, came a few steps nearer to reality last week. The Dunlop Rubber Company announced that, jointly with the Battelle Institute, Geneva, and with the backing of the National Research Development Corporation, it has devised a viable conveyor system capable of speeds of ten miles an hour or more yet fully accessible to the old and infirm.

Passenger conveyors tried about ten years ago in the United States had a rubber belt sliding along a steel bed. Problems of friction soon led to the abandonment of this idea, and later designs had a belt running over rollers. This system was efficient though bumpy and uncomfortable, and Dunlop some years ago devised a belt strengthened by lateral and longitudinal steel cords. The belt needs support only at its edges: its centre span apparently gives a smooth ride.



Photomontage of a Dunlop conveyor mounted above a city street. The whole structure weighs little, and support columns can be widely spaced.

The other outstanding problem in conveyor design is access. A conveyor can move at no more than $1\frac{1}{2}$ m.p.h. if its passengers have to step straight on to it. The Dunlop-Battelle system solves the problem quite ingeniously. At an access point, steps continuously emerge from an entrance comb—as in a normal escalator—and move towards the conveyor. The steps are set in parabolic tracks so that while their forward motion is constant, they are also subject to a small lateral acceleration, which continues until the steps meet the conveyor, exactly matched to it in sideways speed. Disembarking would, of course, take place in reverse sequence: one continuous loop of steps could handle both entrance and exit at a station.

A double moving belt three feet wide could carry 30,000 passengers an hour over a route of perhaps two miles. Routes would have to be fairly straight—Dunlop estimates that its belts have a minimum radius of curvature of 900 feet. Cost is estimated at £2 million a mile—about a third of that of the Victoria Line. Cost per passenger mile is expected to be competitive with current systems.

The first full scale version of the conveyor is expected in 1971 and already several city authorities here and abroad are taking a close interest in the development. The GLC Covent Garden Plan of a few days ago made reference to a conveyor system of some sort, but

Dunlop says that it does not know whether the GLC had its own system in mind. The company expects to spend about £500,000 on the development of the system, and costs will be shared equally with the National Research Development Corporation. The Battelle Institute apparently has no commercial stake in the enterprise—it merely has a research contract for the entry and exit device.

EMPLOYMENT

Woman Power

MORE evidence of the scarcity of women in technical jobs is provided in the November issue of the Government's *Employment and Productivity Gazette* (HMSO, 6s). An article entitled "Opportunities for Girls in Skilled Work" reports that between 1950 and 1967 the number of employed women in Britain increased from 7 million to 8.6 million, accounting for almost two-thirds of the total increase in labour force. A survey by the Government Social Survey in 1965 showed that although married women work chiefly to augment the family income, they also want company and escape from boredom, and the indications are that in future most women will work and most of them will work outside the home, except for perhaps 10 to 15 years while their children are young. But most of the increase in women's employment so far has been in clerical work or jobs requiring little training; and in the engineering and electrical goods industries there has been a sharp decline in the proportion of women in professional and technical posts.

In Russia, 30 per cent of engineers are women and in Sweden the figure is seven per cent, but in Britain more than 77 per cent of girls entering employment in 1967 went into clerical work or jobs requiring less than two months training. Only 7.2 per cent went into apprenticeships, of whom three-quarters were in hairdressing. The report finds it unsatisfactory that many girls, who have never been shown to be less able than boys, should be doing jobs which do not make full use of their abilities.

If the range of women's employment is to be broadened, a number of prejudices must be overcome. Many girls and their parents feel that certain jobs, like clerical work, are suitable for girls, while work in industry is usually dirty and unfeminine. Equally, science is often considered an unfeminine pursuit for sixth form girls. Many never think of entering a less traditional field of employment, or if they do they feel that prejudice will halt their progress. Girls receive scant encouragement from employers, who tend to consider that training girls is a waste of money. The report agrees that there is some truth in the belief that family commitments make it difficult to obtain an economic return on the training of girls, but points out that this idea ignores the changing pattern of women's working lives, with more women returning to work after having their families.

Attempts to ease this situation are under way, but success seems to be slow in coming. The Engineering Industrial Training Board has reminded employers that women and girls can make a contribution in the more highly skilled jobs, and has expressed the pious hope that girls will become more interested in careers in engineering. The board's new proposals for craft