

Non-coherent light pipes are already being used in dentistry, built into dental mirrors and drills.

In common with the laser, fibre optics may yet find its most important application in telecommunications. Fibre optics engineers are already talking of constructing light guides with lengths measured in miles, carrying information in the form of pulses of light. The problem is that present glasses can only be used to make guides up to about 100 ft in length, because of absorption in the glass. So far, the lengths of the longest guides have been tens of feet rather than miles. Research is therefore likely to concentrate on finding new materials with transmission properties which will make long fibres feasible.

## Economical Desalination

DESALINATION as a source of fresh water is well established technically. Now, like nuclear power, it faces a period in which its economic advantages are likely to be argued out *ad nauseam*. A new report, produced by M. J. Burley and P. A. Mawer of the Water Research Association (WRA, £5), sets the ball rolling. It examines the various ways of removing salt from water and of bringing brackish water up to a drinkable standard, and describes the situations in which each method would be economically justified.

The first, and most important, conclusion is that flash distillation, so far the market leader in desalination equipment, is unlikely to be economic for base load production of fresh water in Britain for "a considerable number of years". Conventional water supply schemes can almost always supply fresh water at costs of less than 3s. a thousand gallons—of twenty-four schemes considered in the report, only two were more expensive than this. In contrast, flash distillation costs are well in excess of 3s. per thousand gallons, and without favourable financing and low cost steam would be unlikely to fall below 4s. 8d. per thousand gallons. Where a supply of brackish water is available, electro-dialysis offers a better alternative, although it can only be used with mildly brackish water. The costs of this process, the report says, would at least in some cases fall below the 3s. per thousand gallons reference line. The additional costs of boreholes, effluent discharge and the like would add only another 3d. to 4d. a thousand gallons. Reverse osmosis, the report says, is unlikely to be competitive with electro-dialysis for the treatment of low salinity, but it may well become cheaper for the slightly more brackish sources.

But the most interesting conclusion in the report concerns the joint use of conventional supplies and desalination plant. The idea here is to take more water from a reservoir than would otherwise be justified, and use the desalination plant as a hedge against prolonged dry spells. In this case, the load factor of the desalination plant would be low, perhaps no more than 10 to 15 per cent, but its advantage would be to maintain the overall reliability of the system. The main use of the desalination plant would be during the summer months, when demand for electricity is lowest; it might therefore be possible to negotiate cheap rates for the supply of steam during these periods. If this were done, the overall cost of the water would work out at about 2s. 11d. per thousand gallons. This type of system, it is suggested, might be particularly useful

as a means of deferring major capital investments in new reservoirs until the demand really justifies them. The report also suggests that it might be worthwhile considering the possibility of using desalination to augment all the linked surface water resources in the south-east of England. While this might not show an immediate advantage, it might be a useful scheme later in this century.

## Defence Research

DESPITE the successes of the past few months, the Society of British Aerospace Companies is disturbed about British Government policy towards aviation. The society, represented by Dr D. H. Gardner, Mr L. Boddington, Mr L. S. Greenland, Mr S. Bragg, Mr R. H. Francis and Mr Green, made plaintive noises about it when it gave evidence to the Select Committee on Science and Technology. The chief difficulty, according to the society, is "the absence of a coherent and firm national aerospace programme". The Government should make "a firm declaration of projects which Britain intends to support". Without this, it will be impossible to arrange partnership with foreign countries on an advantageous basis. "The UK has no bargaining lever in securing design leadership if it is known that it will not embark on a project except in partnership with a foreign country".

Dr Edmund Davies was unimpressed by these arguments. What the society was really complaining about, he suggested, was not the lack of government policy but its direction. The policy was quite clearly defined in the White Papers, and the society was alarmed because it involved no major aircraft projects. Why did the society itself not produce a plan? Dr Gardner revealed that "steps were being taken to see if this can be done". Dr Davies suggested that the society's case was equivalent to saying that it wanted a guaranteed home market for its products, while at the same time arguing that the export market was vast.

The society gave a jaundiced view of the virtues of international collaboration. Mr Green said that the loss of technical information across the Channel had become far more serious than the loss of manpower to the United States. But within Britain, at least, things seem to be getting better. A new committee had been set up, with members from the Ministry of Technology, the industry, the nationalized airlines and the Air Registration Board, to discuss research policy. This was a splendid innovation, and gave the industry a chance of influencing research policy at an early stage. But the society claimed that not enough research was being done. There was a particular need for a wind tunnel suitable for work on low-speed aerodynamics, very important for problems of take-off and landing. The industry had been asking for this tunnel for seven years, but it was not yet built.

The witnesses could give no clear explanation of the industry's failure to estimate costs more accurately, except to say that the initial estimates, usually the least accurate, were produced by government departments. Unless the specifications were firm, it was impossible to produce reasonable estimates. If specifications changed, as they often did, then so quite naturally did costs. But in part it seemed that escalation in costs was caused by always trying to do more than had ever been done before. Producing less ambitious