

## OLD WORLD

### TELEPHONES

## Anachronism on the Way

from a Correspondent

THE British Post Office has surprised nobody and disappointed many by finally deciding on a large analogue switching system for its telephone exchanges in the late 1970s and early 1980s. The system, called the TXE-4, has been under development by Standard Telephones and Cables Ltd, one of the Post Office's traditional equipment suppliers. But as the TXE-4 handles analogue signals only, it cannot mesh with the pulse code modulation digital transmission systems which the Post Office is installing and boasting about. As there is no doubt that the telephone system will eventually be all-digital—as it must be to handle computer data, television and voice signals indiscriminately at high speeds—the TXE-4 is, before it is installed, an anachronism. To adopt it for the future is like adopting a design of traffic roundabout that cannot accept traffic from the latest motorways.

But the Post Office, like the heart, has its reasons. The chief advantage of the TXE-4 is that it will speed the replacement of the old-fashioned Strowger switching on which 95 per cent of the national telephone system still depends. The TXE-4, based on reed-relays, is a semi-electronic exchange. It can provide up to 70,000 lines—the size of a large local telephone exchange—and resembles the TXE-2, the smaller semi-electronic exchange which the Post Office is already ordering at the rate of three a week. This type of switching is the only system available that is truly compatible with the existing Strowger. Moreover, it is ready, or almost ready—STC has one developmental model working (although at costs that are nowhere near competitive with Strowger exchanges). The £15 million contract that the Post Office has given STC will allow the company to put the TXE-4 into production and to give the Post Office, under this contract, eighteen of them.

Mr Edward Fennessy, managing director of Post Office telecommunications, has conceded that in making this major and long-deliberated decision, the Post Office may be accused of over-conservatism. So it might. There had been hopes that the Post Office would decide on a computer-controlled switching system, preferably an all-digital one. But to do so would have meant a delay of several years. The enthusiasts for the TXE-4 say that it can be computer-controlled when the need arises and that it will therefore not be obsolete—merely obsolescent

when the all-digital communications network arrives. The Post Office clearly has bent over backwards to avoid repeating the disastrous mistake of the 1950s—the decision to go for all-electronic switching without an intermediate stage. It is being super-cautious, and perhaps the chance for practical immediate improvements to the existing telephone network will justify it.

But exchange equipment is big business, one which gave British telecommunications manufacturers the leading position in world markets. Nobody abroad is going to buy the TXE-4, it seems safe to say. It is too eccentrically British to have much appeal abroad. (The expense of its development has been rebuked by the Committee on Public Accounts.) Neither will it achieve another objective supposedly held by the Post Office—to stimulate competition. If in December 1972 the Post Office decides to install the TXE-4 on a major scale, STC will probably teach GEC-AEI and Plessey how to make it. Thus the old circle of suppliers—the ring—will be just as closed to outsiders as it was before Parliament asked the Post Office to act as a real business in the outside world. The alternative would have been for the Post Office to buy large semi-electronic exchanges abroad and let the British industry get on with the development of the more advanced computer control exchanges which the Post Office will need very soon and which have great export potential.

### RESEARCH AND DEVELOPMENT

## Small Firms Seedbed

THE theme of the Bolton report published last week is that the British Government should remove the inequalities and disabilities from which small firms now suffer (*Report of the Committee of Inquiry on Small Firms, HMSO, £2.55*). "Benign neglect" is how Mr J. E. Bolton described the government's attitude to small firms so far, and the government's immediate response has been the establishment of a small firms division within the Department of Trade and Industry, as the Bolton report requested.

Deep in the 436 pages of the report are its findings on research and development in small companies (broadly speaking, companies with less than 200 employees), based on one of the eighteen research reports commissioned by the committee (see *Nature*, 233, 226; 1971), but the committee has considered other sources and arrives at some conclusions.

The committee scorns the suggestion that new ideas are excessively costly for small companies to pursue, pointing out that small companies "continue to make

major inventions . . . even in the areas of the most advanced technology". The committee goes on to say, however, that "they cannot possibly play a major innovative, as distinct from inventive, role in activities requiring very large numbers of employees and capital such as airframe manufacture". While warning that the statistics available must be interpreted with caution, the report concludes that, on the question of invention as distinct from innovation, small companies "make a disproportionately large contribution, particularly in relation to their expenditure on research and development". The increased costs of research and development are not seen to be a contributory factor to the overall decline of the small company which the committee notes, as costs are in general highest in industries which are already concentrated—for example the aerospace and chemical industries. The greater availability of research facilities from industrial research establishments, government establishments and universities is making research easier for small companies and the report says that there is ample evidence that economic growth is impaired more by a failure to apply existing knowledge than by shortcomings in new research and development.

None of the report's sixty recommendations relates specifically to research and development in small companies, but the general tenor of the report is to make life easier for them and this can only encourage their inventive work. That the Bolton committee considers this aspect of their work to be important is shown by the last three of the eight functions of small firms that the report distinguishes, namely

- that small companies, although they account for a small proportion of expenditure on research and development, are an important and low-cost source of innovation in products, techniques and services,
- that small companies are a breeding ground for new industries—that is for innovation writ large,
- that small companies are the seedbed from which new large companies will grow.

In a statement on the report, Mr Bolton, the committee's chairman, said that "this seedbed function appears irreplaceable" and that the most important question which faced the committee was whether small companies will "survive and flourish in sufficient numbers to continue to provide the seedbed of new enterprise".

### NUCLEAR POWER

## Which Way to Turn?

A REASONED plea is made in the latest issue of *State Service*, the journal of the Institution of Professional Civil Ser-