employment will be unimportant—at the public inquiry during May, the chairman and one of his witnesses, Representative Henry Ruess, were fully agreed that a project costing $1·3 million (up to the end of the prototype phase in 1973) and providing some 20,000 jobs at the Boeing plant at Seattle would be a needlessly expensive way of mounting a public works programme. Mr Ruess was the first of those giving evidence to the subcommittee to ask that the Federal Aviation Agency should publish the regulations on aircraft noise that will have to be satisfied by supersonic aircraft even before the first of the supersonic transports has flown. If this were done, Mr Ruess argued in May, "the rules . . . will ban the Concorde from this country. With the Concorde effectively banned from the profitable transatlantic market, it could no longer be considered a threat to the US aircraft industry or to the US balance of payments. And with the Concorde out of the competitive picture, the way is clear to call a halt to the SST." Representative Ruess went on to say that the British and French governments had both been given a chance, a year ago, to "negotiate a mutual slowing down of the SST race", and that it would be better to provide the financial assistance that Boeing needs by giving the company contracts "to improve our environment rather than destroy it". He called the SST an "environment despoiling superplane for the jet set".

The technical case against the SST recited by Senator Proxmire is based on evidence given by Richard L. Garwin, a physicist with IBM who has made a study of the SST project. He argued in May that successive amendments of the contract between the Boeing Company and the Department of Transportation have degraded the performance expected of the SST and that, for example, take-off noise from the aircraft was set at 93 PNdB (perceived noise decibels) in January 1967, but was now expected to be 110 PNdB. With the 125 PNdB of airport noise which might now materialize, the noise pressure at take-off of a supersonic transport could now be expected to be equivalent to the simultaneous departure of 50 jumbo jets. Mr Garwin provided Senator Proxmire with grist for his mill by pointing out that the contract between the US government and the Boeing Company provides no protection for the government against increases of cost, and that there is no assurance that the step from the end of the government's obligations under the contract (in which two prototypes will log 100 hours of flying time) to the commercial operation of the SST will be bridged by private funds. Senator Proxmire's views on the Concorde, chiefly that technical difficulties and inherent defects of design will prevent the aircraft being a commercial threat, are based on evidence to the committee by Miss Mary Goldring, business editor of the *Economist*.

The subcommittee has almost brushed aside the evidence provided in May this year by the two principal witnesses for the Administration, Mr James M. Beggs, Under Secretary of Transportation, and Dr Russell Train, chairman of the Council on Environmental Quality. Mr Beggs was quick to defend the economic prospects of the SST project, saying that the US Government would get its money back if 300 SST machines were sold commercially, and that there are at present reasonable prospects of sales of 600 aircraft. He also claimed that much could yet be done to reduce the impact of the noise of the SST. Dr Train's evidence might in ordinary circumstances have carried even greater weight, for he asked that "we do not pursue technology for its own sake", went on to express doubt about the feasibility of reducing the noise produced by the SST to acceptable levels but suggested that the present development programme should be continued up to the point at which a sensible decision could be made. The difference between Dr Train and Senator Proxmire is, of course, that the pressure to save money is now being felt more acutely by legislators than by government officials.

INTERNATIONAL COMMUNICATIONS

Keeping Cables Alive

THE American Telephone and Telegraph Company has made to the Federal Communications Commission what amounts to a plea for some kind of balance between telecommunications satellites and submarine cables. AT&T thus becomes the first of several organizations to respond to the request of the FCC last June for opinions likely to be of use in the working out of long-term policies for international telecommunications.

One of the most striking features of what the company has to say is the sheer scale on which new submarine cables are being planned. Left to itself—and the FCC is required to license all new developments in international telecommunications—AT&T would like to install cables each with a capacity of 3,500 circuits on several Atlantic and Pacific routes by the mid-seventies. The first of these cables would be laid in the Atlantic in the first half of 1976, and would be followed by a second three years later. A similar stretch of cable would be laid between California and Hawaii in 1977. With the new design would go cheap installation—a mere $8 a circuit mile for the proposed cable compared with more than $300 a circuit mile for the first fifty-circuit transatlantic cable commissioned in the early fifties and $30 a circuit mile for more recently installed cables.

Part of AT&T's case for the continued installation of cable circuits is a wish to avoid having all its eggs in one kind of basket. The documents submitted to the FCC point out that in a year and a half to the end of July, AT&T lost more than 400,000 circuit-hours of satellite time but only 100,000 circuit-hours of cable time. AT&T, the largest carrier of overseas telephone traffic from the United States, is at present using roughly 2,000 external circuits, evenly divided between submarine cable and satellites. The company estimates that it will need 8,000 circuits by 1975 and 20,000 by 1980. Although most of the growth in the cable business lies in the transatlantic area, AT&T has ambitious plans for other routes and is, for example, planning to install a 825 circuit cable westwards from Hawaii in the late seventies.

At this stage, the response of the FCC to this view of how to strike a balance between satellites and cables cannot be predicted. It seems probable, however, that the rash of satellite failures that has recently plagued Comsat, together with the difficulties that persist in the negotiation of a new agreement for Intelsat, will ensure that close attention is paid to what AT&T has had to say.