

## ENGINEERING

**Space Structures**

THE official opening last week of the new space structures laboratory at the University of Surrey was a gala occasion attended by some 300 guests of the university. The building, constructed according to a new technique by the British Steel Corporation's tubes division, is a gift from the corporation to the university. Lord Robens, the university's vice-chancellor, said most appropriately, when he accepted the building from Lord Layton of the BSC, that the gift "forged close links" between university and industry.

The building is 100 feet square and is supported only at its sides. The roof is constructed of steel tubes which range in diameter from 2 inch to 3½ inch, and the novelty of the construction lies in the rapid assembly "nodus" joints which connect the tubes. A spokesman for the BSC estimated that the cost of building a similar type of roof elsewhere would be £0.70 a square foot and that the maximum area of a roof of this type—without any central support—is 40,000 square feet.

The development of structures with such large spans in Britain has arisen to a great extent from the efforts of Professor Z. S. Makowski, head of the department of civil engineering at Surrey. Professor Makowski was the consultant to BOAC on the construction of the Jumbo jet hangar at London Airport, which has a span of 450 feet, and the collaboration between the BSC and the University of Surrey in the construction of the new laboratory arises chiefly from Professor Makowski's interest in space structures.

Mr R. G. Taylor gave the BSC's view of collaboration between university and

industry, and he pleaded for greater communication between the two. He also said that there is a need for a "comprehensive schedule or a single reporting point to which research should be referred or from which subjects [for research] might be selected". Mr Taylor thought that the university should orient itself in a much greater way towards sales—"selling first itself and then the fruits of its labours".

Mr Taylor ended on a highly speculative note, calling on British civil engineers to produce a viable alternative to a channel tunnel. A channel bridge, according to Mr Taylor, could now be built, incorporating unprecedented spans, with only fourteen supports compared with the 114 suggested in one of the earlier plans for such a bridge. A bridge, said Mr Taylor, would be eminently preferable to "two tubes underneath the water" which would only take trains.

## SPACE

**An Imminent Decision**

MR MICHAEL HESELTINE announced this week that the British government is providing £240,000 as extra finance to the European Space Conference to enable it to carry out further exploratory work on the possibility of European collaboration in the post-Apollo programme.

It is expected that the ESC ministers will make up their minds on collaboration with NASA in July and the extra finance will give Mr Heseltine—and the British government—breathing space as well as providing time for the minister to find his feet in his new job.

The American invitation calls on European countries to contribute up to 15 per cent of the cost of the programme, which for Britain could amount to £8

million a year, initially for a five year period. Before July Mr Heseltine and the government have to decide on the future course of British aerospace which has been under review since the Black Arrow programme was cancelled last year. In principle Mr Heseltine now has to decide whether or not Britain is interested in working on the space tug which would be launched by the shuttle and operate in orbit.

The £240,000 grant will mostly be spent with British companies. In particular, the British Aircraft Corporation which has been working on a small government grant in collaboration with North American Rockwell on the structural and avionic aspects of the shuttle, will no doubt get a large slice of the money.

The announcement of the grant will no doubt please NASA, which is very keen to have European collaboration in the programme. The launch of Apollo 16 last Sunday was the penultimate thrash of the dying Apollo programme and after the last Apollo launch in December the programme will grind to a halt with many scientific questions about the moon still unanswered. It is in this light that NASA is turning its attention to the thorny problem of the shuttle.

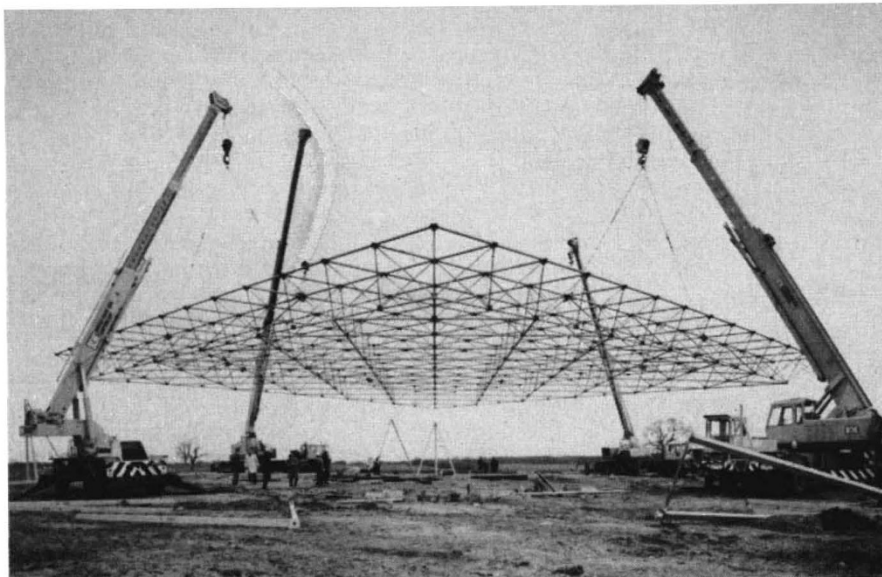
The development of the shuttle—already much curtailed in size and scope compared with the original plans—seems now to be assured. But the role Europe will play in the programme will not be clear until July at the earliest. Mr Heseltine has less than three short months to assess the position.

## ENVIRONMENT

**Davoll in the Lion's Den**

ENGINEERS must realize that ever greater manipulation of the natural world is not intrinsically good and that any problems caused by the application of present technology cannot be "confidently left to the even more potent technology of the future". So ran the thesis of Dr John Davoll, director of the Conservation Society, in an address to a gathering of engineers in London yesterday. Speaking to the somewhat grandiose title "Engineers and the Community Conscience", Dr Davoll acquainted the engineers with the environmental problems which mankind faces today, and pointed them down the road to salvation.

Describing himself as a pessimist ("I believe this is prudent"), Dr Davoll said "we cannot risk the consequences of mistaken optimism". Ridiculing "the sort of calculations, based on exponential growth, that show that in 300 years we shall be standing ten deep on a red hot Earth", Dr Davoll said, however, that "the shorter term calculations are



The roof of the Space Structure Laboratory at the University of Surrey being tested before erection at the BSC's Corby works.