

The New Shape of the Industry . . .

between British and foreign manufacturers, but in co-operation in design and eventual manufacture. At this moment a number of important discussions between our members and European manufacturers are going on, and some of these talks, too, will probably result in further valuable co-operation. This being in the interests of the members, the policy of the SBAC is to encourage co-operation and to do what is possible and advisable to facilitate it."

Is this development of international co-operation going to change the shape of the industry again? With the even bigger projects—supersonics and space—are we going to need even bigger units?

"Personally, I have doubts about international co-operation. While I hope something will come of it there is no doubt that there cannot be two queen bees in any hive. Is one country going to knuckle down to another? This is the root difficulty of an international effort, for one company must always be the leader."

You don't feel that supersonic transport and space research are going to be so important in the total effort?

"Of course they are important; but I feel in my bones that the most important projects for this country are those that will provide a large volume of sales throughout the world. The manufacturing business is one of extremes. I liken it at the one end to the building of a *Queen Mary* and at the other to the preparation of fish and chips. Between these extremes lie all the other types of manufacturing. In the case of the *Queen Mary* a large capital investment is required, and it also necessitates carrying a large inventory for many years. At the other extreme little capital investment is needed and there is no work in progress to finance. In other words, I feel there is greater joy commercially in producing a Viscount replacement than in making a supersonic transport. Of course, advance in research is essential, but we have got to get our priorities right. One of the things on which I hope we shall keep our lead is that of vertical take-off."

Do you think components and engines have a special function in the export drive? Should Britain specialize more in this field when we are thinking of the possibility of a joint international effort in the development of very large and fast aircraft?

"I am not clear what you mean by a 'special' function. Engine and component manufacturers have a normal role to play in export business—that is, their job is to provide the British aircraft industry with the best engines and equipment and, over and above

that, to develop and sell the world's best available engines and equipment to other manufacturers and aircraft users. We should certainly not specialize in the field of engines and components to the exclusion of development of large and fast aircraft."

On the point of the special position of components, I had in mind the division of labour on any international effort; is this going to open up new markets for us?

"There is a good deal of interchange already. For instance, Vickers are using some American equipment and my company is providing a major part of the landing gear for the F-104 fighter. Our export of aircraft equipment to America is considerable. There is another related factor. Our American friends are spending so much money and technical effort on space just now that I foresee some curtailment of their efforts on airframe equipment. As a result, it is possible that we shall be able to increase still further our aviation exports to America."

Is there any change in the role of the SBAC in the new set-up? Now that so much inter-company competition has been eliminated, could more be entrusted to a central organization for market and statistical research, for example?

"No change in the role of the SBAC has arisen as the result of the new shape of the industry. Its purpose remains as stated in its Memorandum of Association—'to encourage, promote and protect the British Aircraft Industry,' and that is what it will continue to do. The Society has always engaged in a great deal of statistical and economic research. We have a central organization which could be expanded to cover any other form of research and investigation that might be required."

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The interview made me realize that speaking for the aircraft industry as a whole must be a difficult and somewhat delicate operation. Not all sections can possibly think alike on any given problem. To express an opinion which faithfully reflects all interests must, on some topics, mean that no view of any consequence can be formulated at all. But most will agree, I think, that Sir George Dowty has collated current problems and prospects of the industry very effectively indeed.

He is an essentially individualistic character with strong, sound, down-to-earth ideas, and I found it impossible not to gather something of his own personal thinking. In particular, one notes his cautionary words about the prospects of international co-operation in aircraft construction. And, too, while we are all interested and excited about the possibility of supersonic travel and space research, it is just as well to be reminded that an industry which has to earn its living will have to devote much of its resources to less exotic projects.

UNIVERSITY AERONAUTICAL ENGINEERING

INCLUDED in the Lanchester Memorial Lecture delivered by Prof A. D. Young before the Royal Aeronautical Society on December 22, reported briefly in last week's issue, was the following description of the facilities, scope of work and budget of a typical university department of aeronautical engineering. Prof Young occupies the Chair of Aeronautical Engineering at Queen Mary College, University of London.

The student intake is about 30-40 per year [Prof Young stated] and at any one time there may be between five and ten research students. The aerodynamic equipment includes at least two low-speed wind tunnels of good modern design and about 10-15 sq ft in working-section area, together with a number of smaller tunnels of simpler construction. There are one or two supersonic tunnels with working sections about 20-40 sq in in area and sundry small high-speed jets, and for hypersonic work there are one or two small shock-tubes or a gun-tunnel.

Where the teaching of aircraft structures is the responsibility of the department, as in the case of my department, a laboratory of standard structural test equipment is provided and such laboratories will probably include equipment for vibration investigations and investigations of kinetic heating effects. The teaching staff comprises a professor, a reader and from three to five lecturers, and the department will probably have its own small workshop employing up to half-a-dozen people.

In general the equipment is as small, simple and cheap as modern research and demonstration needs will permit, but ancillary electronic equipment that is increasingly essential for such needs makes very heavy demands on the annual budget. I suppose that the current allowance to my department is not untypical; it is £4,500 per annum to cover all the equipment needs. Of that sum the research students inevitably take the lion's share. Three or four years ago my allowance was less than a third of this figure, and before the war the allowance was about £20! When it is remembered that one good oscilloscope might

cost £800 the limitations that economy must impose on university activities will be very apparent.

Here I must pay tribute to the Ministry of Aviation in all its various metamorphoses for the generous way in which it has supported specific items of university research by means of research contracts. Such contracts were rare before the Second World War, but since the war they have become much more common. Most university departments of aeronautical engineering have one or two research contracts whereby they are able to pay some of the junior research personnel concerned and to buy special ancillary equipment.

I believe that at present the Ministry research contracts with universities on broadly aeronautical topics total about £160,000 per annum. This may seem small relative to American practice, but in the special circumstances that hold in this country, namely the relatively large amount of aeronautical research done in Government research establishments and the intense concern of the universities for their independence, this sum is by no means insignificant except in relation to the return that is made for it.

As for the research students, they are generally graduates with first-class or upper second-class honours degrees, and they are usually in receipt of a grant from the DSIR of value £340 to £420 per annum. I need hardly say that good research students are becoming increasingly difficult to recruit because of the far superior pay that graduates can obtain in industry and Government service, and because the status that is conferred on holders of higher degrees in industrial circles in this country is slight by comparison with that conferred in other countries.

Finally, any assessment of the part played by the universities in aeronautical research must be made bearing in mind not only their limited financial resources but also the considerable demands made on the time and energy of the staff by their rapidly increasing undergraduate teaching commitments, and college and university administration needs.