

Tare weight. The pay load of the 'Comet' is one-tenth of its 'all-up weight', while the fuel accounts for 49 per cent of the weight at take-off, and any unexpected changes in the weight of structure or fuel therefore have rather larger effects on the magnitude of the payload. However, the absence of airscrews ameliorates the problem not only due to the direct saving in weight but also due to the considerable reduction in the size of the undercarriage.

Fuel storage. Seven thousand imperial gallons of fuel are fitted into a thin wing of 115 ft. span, since it is inadmissible to use the fuselage for storage. To save space, tanks integral with the wing structure are used. The problems to be overcome here arise from the structural deformation in flight and from the high permeability of kerosine. The use of metal-to-metal bonding is superior to the classical riveted joints in this connexion, and it is used extensively throughout the 'Comet'. The fuel should be carried far out along the wing in order to reduce the bending moment at the wing root. In a swept wing this presents problems of the shift of centre of gravity, and the order of fuel usage becomes important. Kerosine is a safer fuel than petrol, but fire precautions are taken very seriously since the relighting of 'cut' engines is to take place in the air.

Controls. The achievement of light control-surface operation is possible by aerodynamic means or by the use of power operation. The former alternative was decided against, in view of the long time usually taken in the early flight-trials to get the controls 'right'. No other useful flight-tests are possible until this stage is reached. A power-operated system, however, may be given thousands of hours of use in a ground rig in which most of the conditions of flight are simulated. For safety, each control is provided with two entirely independent power-units.

The solution of these and many other problems is the business of a design team consisting of designers, aerodynamicists and stress-men. Further necessary departments are structural testing, experimental, production and service. The organization is now developing the 'Comet II', which is the original machine modified to take the more powerful Rolls Royce 'Avon' engine, and the 'Comet III', a larger aeroplane altogether.

BRITISH GELATINE AND GLUE RESEARCH ASSOCIATION

THE sixth meeting of the Research Panel of the British Gelatine and Glue Research Association was held at Beale's Restaurant, London, N.7, on November 27, 1952, with Mr. S. G. Hudson (Richard Hodgson and Sons, Ltd.), chairman of the Association, in the chair. Seventy-two persons attended the meeting, including representatives of the manufacturers of plant for the industry.

The meeting was the first held by the Association at which the papers were concerned with practical questions closely related to manufacture. This provided increased opportunity for discussion, of which full advantage was taken. The first paper, "Tannery Treatment of Pieces and Fleshings", by Dr. W. E. Braybrooks (Stokes and Co., Ltd.), described the processes to which the raw materials of the hide gelatine and glue industry are subjected in the tannery prior to despatch to the gelatine works. The effect

was discussed of short dehairing processes, using rotating drums in place of lime pits, on the hide itself, and often using substantial quantities of sodium sulphide in addition to lime.

In the second paper, "The Extraction of Hides", Mr. D. Fysh, of the Association's staff, described a series of experiments in which the industrial treatment of hides by lime suspensions, followed by neutralization, and then extraction of gelatine, was repeated on the laboratory scale. This enabled a number of variables to be studied, such as pH of extraction, time and temperature of extraction, period of lime treatment, etc. The gelatine produced was evaluated by means of measurements of its physical properties. The third paper was by Mr. D. B. Hall (John Knight, Ltd.), entitled "Bones Processing", in which he presented a detailed account of the origin, handling and processing of the raw material of the bone glue factory. The stage-by-stage analysis of the process showed the problems which arise in the various plant operations. Dr. E. M. Vyner (Sheppy Glue and Chemical Works, Ltd.) gave the final paper, under the title "Aspects of the Evaporation and Drying Process in the Glue and Gelatine Industry". Dr. Vyner reviewed the many possible methods by which a dry end-product may be obtained from a gelatine or glue solution. Apart from the normal methods of multi-effect evaporation, setting and drying, spray-drying and freeze-drying have been tried.

On the previous day, at the annual general meeting, Mr. G. W. Odey, chairman of Barrow, Hepburn and Gale, Ltd., was re-elected president of the Association. The chairman of the Association, Mr. S. G. Hudson, stressed the importance to firms using gelatine and glue of the work on this aspect being commenced by the Association. The director of research, Mr. A. G. Ward, in his report, and Sir Roger Duncalfe, chairman of British Glues and Chemicals, Ltd., who proposed a vote of thanks to the council and staff, both emphasized the value of close contact between the Association and the industry.

CAREERS IN BIOLOGY

THE Institute of Biology recently held a second symposium on "Biology as a Career", at which were discussed fields not covered by the Edinburgh conference (*Nature*, 169, 1034; 1952). A theme common to many of the papers was the need for more biologists having a better training in chemistry and physics.

Sir Harold Himsworth (secretary, Medical Research Council) said that in modern medical research the collaboration of workers from many scientific disciplines is needed. On the scientific staff of the Medical Research Council there are some 440 graduates of whom one-third are medically qualified. Apart from the National Institute for Medical Research, the majority of the Council's staff work in special units which are similar in constitution and size to university professorial units and most of which are associated with universities. In addition, the Council has a system of scholarships for training in research methods. These are designed to enable first-degree graduates to supplement their training and experience in order to equip them for biological research in many fields for which competence in several branches of natural science is necessary. It is perhaps significant that, of those who have received