each getting State grants. All, however, are members of the Central Association of Public Libraries, which is responsible for the training and placing of librarians. Special libraries were late in commencing and are now organized by the Netherlands Institute for Documentation and Organization of Libraries. A very useful tool for Dutch librarians is the Union List of Periodicals held in the 166 libraries in the Netherlands maintained by the Royal Library at the Hague.

Miss De Silva, at present in Aberdeen, spoke of the differences between the libraries in Ceylon, Kenya and the United Kingdom. She pointed out that the two eastern countries were backward and not well equipped. Both countries were similar in basing their libraries upon British methods and Ceylon was the more advanced. There are three libraries in Kenya, the Macmillan Library for Europeans, one for Africans only and one general. J. R. K. PIRIE

EXOTIC FOREST TREES IN GREAT BRITAIN

IT is held that Great Britain contains a larger number of exotic trees than any other country, some of which have been well known for a long time. These have adapted themselves to soils and climate so well that they are regarded as indigenous species. This abundance conceals our poverty of native trees, especially conifers, among which the only natives are the Scots pine, the yew and the juniper, the latter little more than a straggling bush. Among broad-leaved trees the difference is not so great, but even in this group familiar trees such as the sycamore, the horse chestnut and the plane have been introduced in historic times. The sycamore is notable for its rapid growth in youth, for the lovely tree produced and its great fertility, young seedlings springing profusely from the seed shed in most years.

The Forestry Commission has recently published Bulletin No. 30 on "Exotic Trees in Great Britain", prepared by Messrs. James Macdonald, R. F. Wood, M. V. Edwards and J. R. Aldhous for the British Commonwealth Conference held last July in Australia and New Zealand (H.M. Stationery Office, 1957). The Scots pine formed forests in the Highlands of Scotland, but the Norway spruce, now so common in Britain, was absent. The beech was native only in the south of England and absent from the deciduous forest dominated by oak in the rest of the country. This is in marked contrast with France, where the great oak and beech forests are the glory of that country. Part 1 deals with general considerations affecting exotic forest trees in Great Britain; Part 2 exotic coniferous trees; and Part 3 exotic broad-leaved trees in Great Britain.

The poverty of the tree flora of the British Isles is attributed partly to geographical situation and partly to recent geological history. The introduction of exotic species was at first due to individuals who brought them in for æsthetic purposes on their estates. More recently, commercial motives have increased the rate of introduction of some species such as the sitka spruce and Douglas fir from North America and the Japanese larch. The European larch came in much earlier and was planted on private estates, but the Norway spruce and the silver fir were imported during the past two centuries.

The sitka spruce has been largely used in the twentieth century by the Forestry Commission in planting the new forests of Britain, as have the Japanese larch and the Corsican pine. Thirty-eight genera of conifers and twenty-two genera of broad-leaved trees have been introduced into Britain.

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

REPORT FOR 1956

THE second annual report of the European Organization for Nuclear Research (CERN), covering the period to the end of 1956*, is—as Prof. C. J. Bakker, the director-general of the Organization, remarks in his brief introduction—a straightforward account of development during the year, which indicates that rapid progress has been made in accordance with the plan outlined in the previous annual report (*Nature*, **178**, 902; 1956). However, several years of intensive scientific and technical work still lie ahead before Europe's great joint laboratory for advanced nuclear research can begin to operate fully. Except for the high-frequency system the synchro-cyclotron was practically completed; it was expected to come into operation during 1957. The buildings for the proton synchrotron were also nearly finished and orders for most of the components of the accelerator have been placed. The many illustrations and photographs given in the annual report show clearly the remarkable progress made in the construction of these two large accelerators and their associated buildings, and much detail of the layout and characteristics of the machines is also given in the two sections of the report devoted specially to them.

The purpose of the two-week symposium on high-energy accelerators and pion physics, organized by CERN and held in Geneva during June 1956, was to gather physicists from all over the world and thus enable the Organization to start playing the part for which it was intended as an international centre of advanced studies. 319 scientists from twenty-two countries, including some fifty American and an equal number of Russian scientists, attended. Most of the papers presented had been pre-printed either in English or French and were circulated before the conference. The discussions were recorded, and the proceedings were afterwards published in full in two volumes (see *Nature*, **179**, 283; 1957). It is proposed to hold a similar symposium in 1958. During the first week the principles and methods used in the con-

* Second Annual Report of the European Organization for Nuclear Research (CERN), 1956. Pp. vi+71 (19 plates). (Geneva: European Organization for Nuclear Research, 1957.)

struction of high-energy accelerators were discussed, and during the second week particle-detecting equipment and high-energy nuclear experimental research with special reference to pion physics. The section of the annual report describing the symposium includes a summary of the main contributions and of the new advances in research discussed, and a list of the titles of the papers which were presented by members of the staff of the Organization is given in an appendix.

No major change in the internal structure of the Organization took place during 1956. Theoretical work was carried out both under the direct control of Prof. Bakker at Geneva on cosmic rays and in the Theoretical Study Division at Copenhagen; the other five Divisions consisted of the Proton Synchrotron, Synchro-Cyclotron, Scientific and Technical Services, Site and Buildings, and Administration. The number of the staff increased from 260 to 396, and in addition there were eight half-time workers, fourteen consultants and twenty-two Fellows. Thirty-one scientific articles were published and a very large number of lectures and colloquia, all of which are listed in the annual report, were arranged.

In the field of equipment the set of two cloud chambers was successfully completed by the Scientific and Technical Services Division and will be used for experiments on K-mesons. The Division has been studying the techniques of production and handling of liquid hydrogen and liquid helium for low-temperature work, and a liquid-hydrogen plant with a capacity of 20–40 litres/hr. is being built. An experimental liquid-hydrogen bubble chamber, 10 cm. in diameter, and later a larger chamber, 30 cm. in diameter, are to be constructed. Following Harwell and Saclay, and with a view of establishing interchangeable methods and means of computation with these two establishments, the Organization has ordered a 'Mercury' electronic computer, and an experienced mathematician-physicist has been recruited to direct the Computer Section of the Division. In addition, two engineers of the Division spent four months with the electronic groups at Harwell and Saclay.

EMBRYOLOGY OF POGONOPHORA AND CLASSIFICATIONS OF ANIMALS

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THE past twenty years have considerably widened zoological conceptions concerning the types of animals which are phylogenetically associated with the echinoderm-chordate stem. Kozlowski[1] (1938, 1947) dissolved the matrix from certain graptolites and cleared them, so demonstrating a similarity in budding and tube structure to *Rhabdopleura*, thus suggesting a protochordate rather than a coelenterate affinity for this great group of fossil animals (see also Bulman[2]). At that time much had been found out concerning evolution within the graptolites, but no clear evidence had been obtained as to the grade of organization of their soft parts, so that their systematic position was obscure. The class Pogonophora was described in 1937 by Johansson[3]. But it was the anatomical work of Ivanov in the University of Leningrad[4], on two orders of Pogonophora, collected from deep water in the north-west Pacific, which provided a sufficiency of detail both to demonstrate their place in the animal kingdom near to the Enteropneusta, and to show the extraordinary occurrence of extracellular digestion and absence of a gut in a non-parasitic triploblastic animal.

Recently, Ivanov[5] has given embryological details of a certain number of developmental stages of Pogonophora from the Okhotsk Sea, the preservation of which has been sufficiently good for sectioning. He stresses the incompleteness of the series and imperfections of fixation; but his results are of such interest that a summary is given below, together with reproductions of some of the figures. Reference must be made to the original publication in Russian for further details.

About 32 batches of eggs, mainly of *Siboglinum caulleryi*, have been studied. The eggs in each batch, up to 42 in number, lie in a row inside the parental tube distal to the head of the mother (Fig. 1), where they undergo most of their development. No free-swimming larvæ are formed. The bilaterally symmetrical egg, much elongated in *Siboglinum*, is heavily yolked; the nucleus (Fig. 2) lies nearest to the concave side of the egg. The darker distal pole of the egg gives rise to the anterior end, and the more yolky proximal pole to the posterior end of the young adult. Fertilization is presumed to take place in the tube. The nucleus migrates to the distal end of the egg, and after fertilization returns to the middle region; the egg then becomes invested by a soft vitelline membrane. Development within each clutch is synchronous.

Cleavage is total, unequal and appears to be 'determinate'. There is no trace of either the spiral or typically radial type of cleavage, and the unique pattern appears to be anything but primitive. The egg shortens and divides diagonally, and unequal cleavages beyond the 4-celled stage are not synchronous (Figs. 3 and 4). Bilateral symmetry is marked at the 80–85 celled stage, large cells lie at the posterior end and on the convex side, and two very large cells are situated towards the anterior end on this side (Figs. 5 and 6, same embryo).

By the 130- to 140-celled stage internal cells are established, presumably by delamination or by overgrowth. Three large endodermal cells, one extending in front of the other two, fill most of the interior of the embryo, and contain the bulk of the yolk (ruled in three different directions in Figs. 9–11). Two surface cells rich in yolk lie in the middle of the convex side (dark in Fig. 8). In addition, two small groups of cells, presumed to be mesenchyme, are situated as shown in Fig. 10. The posterior outer cells are rich in yolk, and the large pair of anterior cells (Figs. 8 and 9, same embryo) remain unchanged for a while; their fate is unknown. This stage represents a gastrula, but a blastopore is not formed.