It is not clear what activates the sperm. Cross-fertilization occurs, by the introduction of foreign sperm into a ciliated fertilization chamber, and, as usual in hermaphrodite molluscs, waste eggs and sperms are destroyed by phagocytosis. The fertile egg is enveloped in albumen inside its shell, then the winding gland adds gelatinous material and fixes the egg in position in an egg string held together by mucus from the nidamental and oviducal glands. The spawn after extrusion has not been found, but *Retusa*, an allied genus, has lumpy egg masses. Lemche says that *Cylichna* exhibits "simultaneous functional hermaphroditism without functional protandry".

The work is excellently produced and is illustrated by forty-six plates, with 361 figures; thirty-six plates are in half-tone, the remainder line blocks. In Plates 1-3 it is convenient having figures of the four species side by side for comparison. Plate 5 of the nervous system is not good; the figures 51-59 are too small, the outlines of the ganglia too faint and the wide-spaced guide lines to the reference letters are trying to the eye, so that one has to trace the figures to understand them. Fortunately, a clear coloured sketch of the nervous system in a line drawing is given on Plates 45 and 46, to which the reader should refer. Both these drawings are reconstructions from serial sections.

It would have been helpful if a diagnosis of each of the four species had been summarized, or a key to them provided.

N. B. EALES

CATALYSIS

Catalysis

Edited by Prof. Paul H. Emmett. Vol. 4: Hydrocarbon Synthesis, Hydrogenation and Cyclization. Pp. vi+570. (New York: Reinhold Publishing Corporation; London: Chapman and Hall, Ltd., 1956.) 100s. net.

Catalytic Reactions

By V. I. Komarewski, C. H. Riesz and F. L. Morritz. Photochemical Reactions. By C. R. Masson, W. Albert Noyes, Jr., and V. Boekelheide. Electrolytic Reactions. By Sherlock Swann, Jr. (Technique of Organic Chemistry, Vol. 2.) Second completely revised and augmented edition. Pp. ix+543. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1956.) 11.50 dollars.

VOL. 4 of "Catalysis" contains, as its main feature, a series of four chapters, by R. B. Anderson and by L. J. E. Hofer, on various aspects of the Fischer-Tropsch hydrocarbon synthesis, in which long-chain aliphatic hydrocarbons are built up by the polymerizing hydrogenation of carbon monoxide. The reaction involved has considerable fundamental interest: first, from the point of view of the theory of the growth of the hydrocarbon chain; and secondly, on account of the complex catalysts used, from considerations of catalyst promotion. Too little is known, even now, of the mechanism of promoter action, although an appreciable recent contribution to this subject was made in Vol. 3 in a monograph by a group of chemists from the Dutch Staatsmijnen; and multi-component catalysts still have largely to be found empirically. The general treatment of the Fischer-Tropsch reaction in the present volume constitutes a reason-

ably comprehensive and well-documented review of the development of this industrially important process; and the interesting variation, known as isosynthesis, by means of which branched-chain, in place of normal, hydrocarbons are produced by varying the catalyst and by working at high pressures is also discussed in a chapter by E. M. Cohn.

The remaining sections, by M. Greyson, S. W. Weller and H. Steiner, are rather short and cover, respectively, the methanation of the carbon monoxide content of fuel gases, the liquid-phase hydrogenation of coal-oil pastes and, in a preliminary way, cyclization. Of these, the chapter on destructive hydrogenation in particular might well have been longer in order to provide a more adequate survey of berginization as an alternative to the Fischer-Tropsch synthetic approach to artificial hydrocarbon oils. This, however, is a minor criticism; and the volume under review certainly maintains the general high standard of the previous volumes in what will without doubt take its place as a major standard work on catalysis.

The second of the above books is part of a new edition of a well-known practical text-book dealing with laboratory techniques. There is a refreshing clarity in the monograph on the scope and experimental technique of the application of catalysis in organic chemistry which constitutes almost three-quarters of the volume; the contributors—V. I. Komarewski, C. H. Riesz and F. L. Morritz—are to be congratulated not only on their selection of good standard methods of catalyst preparation but also on their omission of much that is less material. In this, it is very evident that the selection has been based on practical experience, rather than on a survey of the now very large mass of available literature. This applies also to the review of apparatus for carrying out various types of catalytic reactions, high-pressure hydrogenation being treated in special detail. The article on photochemical reactions, by C. R. Masson, V. Boekelheide and W. A. Noyes, discusses the types of organic syntheses and other reactions which can usefully be carried out by the absorption of light quanta and reviews light sources and the general working methods involved. The final chapter, by S. Swann, covers electrolytic processes.

This issue of a second and enlarged edition of an already well-received text-book is an indication of the demand for works of this type. E. B. MAXTED

MUSEUM TECHNIQUES

The Conservation of Antiquities and Works of Art Treatment, Repair, and Restoration. By Dr. H. J. Plenderleith. Pp. xvi+373+55 plates. (London: Oxford University Press, 1956.) 63s. net.

ALTHOUGH 'conservation' is traditionally quoted as the second function of a museum, those in charge of these institutions are often hard pressed to discover details of the correct methods to be adopted. Two books by the present author, "The Preservation of Antiquities" and "The Conservation of Prints, Drawings and Manuscripts", have been out of print for several years, and though very useful to curators, were scarcely sufficiently detailed in respect of the methods advised. The museum profession, therefore, is delighted that Dr. H. J. Plenderleith, of the Research Laboratory of the British Museum, with the practical experience of more than thirty years, has made the