

subsequent volumes being devoted to the individual resins; it is divided into morphological, physical and chemical sections following a lengthy chapter on the formation of the exudates. This first chapter is copiously illustrated both with microscope drawings of cell structure and with photographs of the trees showing the method of collecting; it includes one fine plate in colours illustrating the fluorescence analysis of balsams and resins in the quartz lamp. The thorough and exhaustive nature of these sections which characterise the resins are exemplary.

The chemistry chapter commences with a section some hundred pages in length detailing the historical development of this special inquiry. It starts back in the sixteenth century with recollections of amber, which incidentally gave the name to electricity, and may be traced through the period of qualitative investigation in the eighteenth century and of quantitative study in

the early nineteenth from the days of Unverdorben to those of Hlasiwetz. Dry distillation and fusion with alkali were among the processes summoned to help, and protocathechuic acid and phloroglucinol were recognised as important constituents. The application of newer methods to the inquiry largely begins with Tschirch's own work, commencing in 1886. The whole is a story of profound interest to the expert and the value of the section is enhanced by the copious references to the original literature from 1661 onwards; few subjects can have been more thoroughly monographed on the chemical side.

The problem of the resins is far from solved; like other complex polymers of high molecular weight, such as starch and the proteins, they are mixtures—a point emphasised by Tschirch.

The chemical section describes the generalities; the details of each resin will follow in the subsequent volumes. E. F. A.

### Short Reviews

*A Modern Outline of Evolution.* By George Whitehead. Pp. vii + 324. (London: John Bale, Sons and Danielsson, Ltd., 1933.) 7s. 6d. net.

MANY books on organic evolution written by scientific men famous for their researches are suitable to students but not to the public, who do not desire more than passing references to the facts and the general outline of theories. The book before us has no illustrations; it is reasonably cheap and as it nowhere labours, it is comfortable reading. It thus should be a useful guide to those who wish to understand 'the complex manifestations of life'. It is frankly a compilation, the story of the origin of the earth leading up to that of life. Evidences of evolution are next given and then the theories as to how it comes about, suitably ending up with a chapter on vitalistic evolution. Unfortunately there is a certain lack of understanding of the physiology of animals, function and anatomy being two inseparable factors. The chapter on Kropotkin's 'mutual aid' seems a curious and unnecessary interpolation between Darwin and Weissmann; and that on "Mutations and Mendelism" should in our opinion be entirely rewritten.

There can be no clear differentiation in the reader's mind between fluctuations and mutations, and the author's references to the opinions of those who are not researchers in this field are often valueless. The term 'character' or 'characteristic' has a clear meaning, and why it is stated that only about seven such "can be found" in the pea is extraordinary, since recent research suggests that all characters are Mendelian, and more than 400 characters have been determined in *Drosophila*.

Further, no book on evolution can be regarded as complete which does not give some account of recent research on genes, hereditary structural units responsible for every transmissible character. This is now the chief field of research leading up to the understanding of the mechanics of organic evolution, and one which the author need not fear to summarise in his second edition.

*Dr. H. G. Bronns Klassen und Ordnungen des Tierreichs.* Band 4, Abt. 2, Buch 2: *Acanthocephala*. Bearbeitet von A. Meyer. Lief. 1. Pp. 332. 39.60 gold marks. Lief. 2 (Schlusslieferung). Pp. vi + 333-582. 32 gold marks. (Leipzig: Akademische Verlagsgesellschaft m.b.H., 1932-1933.)

DR. MEYER gives an interesting historical account of the *Acanthocephala* from their discovery by Leeuwenhoek (1695) who found two species in the gut of the eel. Koelreuther (1771) and O. F. Müller (1776), who independently recognised that these worms were different from other helminthes, named the first two genera, *Acanthocephalus* and *Echinorhynchus*. Bremser (1811), who is stated to have examined 40,000 individual animals for the presence of *Acanthocephala*, and Rudolphi, whose published accounts extend over the period 1795-1820, added much to our knowledge of these parasites. Westrumb produced in 1821 the first monograph of the group, which included a description of 90 species and an account of the anatomy and physiology. Leuckart (1862) initiated the studies on the life-history, and various writers, including the author, have developed the systematics of the group.

The historical account is followed by the