

trypanosomiasis being discovered, all from one district, although *Glossina palpalis* was common, and in only one tsetse fly were trypanosomes detected. Animal trypanosomiasis was also found to be rare in Liberia. In the Congo, of course, conditions were very different, and more space is devoted to the subject in dealing with that region.

In Chap. xxvi. we find useful information on economic plant diseases. No infectious disease, however, was found to affect the oil palm, which is extremely common in Liberia, much more so than in the neighbouring protectorate of Sierra Leone, and should be of great commercial importance. The question of whether monkeys may act as hosts for the malaria parasites of man is considered in Chap. xxvii., and the reader will experience a sense of relief at the realisation that there is still no evidence that malaria can be transmitted from the apes to man, although plasmodia, in some cases indistinguishable under the microscope from malaria parasites in the blood of man, are not uncommon in both monkeys and the apes. Beautiful coloured illustrations of these latter protozoa are given in Chap. xxx.

An interesting botanical report of Liberia, with some very good reproductions, concludes vol. 1.

Vol. 2 deals with the mammals and birds of Liberia, birds collected in the Belgian Congo, and medical and economic entomology. It does not contain merely lists of specimens obtained on the expedition and descriptions of new species, but also aims at mentioning all the species hitherto collected from this region, thus enhancing the value of the work from the systematic point of view.

C. CHRISTY.

### Our Bookshelf.

*Die Rohstoffe des Tierreichs.* Herausgegeben von Ferdinand Pax und Walther Arndt. Bd. I., Lief. 4. Pp. 161-320. 12·75 gold marks. Lief. 5. Pp. 321-448. 12 gold marks. (Berlin: Gebrüder Borntraeger, 1930.)

THE first 48 pages of the fourth part of this work contain the concluding portion of the chapter on fats, and deal with (1) the occurrence, extraction, characters, and use (largely as the basis of cosmetics) of spermaceti; (2) the animal fats employed with vegetable fats in the manufacture of soap; (3) ox-gall and its uses in industry, chiefly in colour work; and (4) fossil bitumina, including asphalt and petroleum.

The remainder of the fourth part and the whole of the fifth are devoted to a consideration of the skins and membranes of animals used in commerce. Accounts are given of hides and the modes of drying them, and of the chief methods of prepar-

ing leather. The nature and varied uses of the skins of elasmobranch and other fishes and of reptiles and birds are described. Reference is made to the damage caused by 'warbles'—the larvæ of *Hypoderma*, which in Germany in 1929 was estimated to amount to nine million marks. Short accounts are given of the uses of leather in ancient and in medieval times, and of the present usage of leather by natives in different parts of the world; and a note is added on leather money.

The section on the preparation and usage of membranes derived from internal organs shows what each part of the alimentary tract—œsophagus, stomach, small and large intestine—yields in commercial products. Here is found information on the preparation of goldbeater's skin, usually made from the outer layer of the cow's cæcum; of catgut, now made from the small intestine of the sheep; and of the coverings for the vast quantity of sausages consumed, especially in Germany and Austria.

The final chapter, on furs, opens with a description of the different types and arrangement of hair, and the successive changes in the hair and its colour during the growth of the animal. This is followed by an account of the North American and Russian fur trades. A survey (unfinished) of the principal furs of commerce is arranged in systematic zoological sequence, beginning with the Monotremes.

These parts present a compact source of information which is rendered readily accessible by the use of subheadings in heavy type. In each section, historical data are given, and a bibliography is appended.

*Determination of Orbits of Comets and Asteroids.*

By Prof. Russell Tracy Crawford. Pp. xi + 233. (New York: McGraw-Hill Book Co., Inc.; London: McGraw-Hill Publishing Co., Ltd., 1930.) 20s. net.

IN NATURE, July 14, 1928, a note appeared on the second (reset) edition of Bauschinger's "Bahnbestimmung der Himmelskörper", with an appeal for an English translation. Bauschinger's treatise, however, had not been brought up-to-date since its first appearance in 1906, and was expensive (£3). These defects were remedied a year later in a volume by Stracke, of the Rechen-Institut in Berlin, which dealt with modern methods (except Leuschner's) including their adaptation to calculating machines. But there has been no text-book in English since Watson's "Theoretical Astronomy" in 1867. Prof. Crawford has now filled this gap in our literature. In order to keep his book within the bounds of a university text-book that can be mastered in a one year's course, Prof. Crawford has assumed a working knowledge of spherical astronomy. He develops his subject concisely, and leaves the more difficult subjects of perturbations and definitive orbits for later and more specialised study. The two methods described are a modern adaptation of Laplace's by Leuschner, and a recent modification of Gauss's by Merton. The former is the favourite method in America, but it has never been taken