chemistry, Professor Luck has wisely decided to emphasize certain selected topics. Even then the contents, included within a volume of 639 pages, is bewildering. The topics discussed are permeability (Jacobs); biological oxidations and reductions (Sonderhoff); enzymes (Sumner); carbohydrates (Irvine and Robertson; Coris); acyclic constituents of natural fats and oils (Chargaff); proteins (Cohn; Kotake); sulfur metabolism (Lewis); purine chemistry (Cerecedo); fat metabolism (Artom); creatine and creatinine (Rose); detoxication mechanisms (Harrow and Sherwin); hormones (Houssay, Deulofeu and Marenzi); choline (Gaddum); vitamins (Harris); nutrition (Brody); muscle chemistry (Eggleton); metabolism of brain (E. G. Holmes); chemical embryology (Needham); biochemistry of malignant disease (B. Holmes); plant pigments (Kuhn); alkaloids (Robinson); minerals in plants (Steward); plant hormones (Thimann); immunochemistry (Heidelberger); and the chemistry of bacteria (Stephenson).

It must by now be obvious to the reader of this review that Luck has succeeded in getting reviewers who, for the most part, are in the front rank in their particular fields. Unfortunately, it does not always follow that the best critical reviews are thereby obtained. Very frankly, some of these articles—but happily a very small number—read like abstracts of *Chemical Abstracts,* reproduced with a complete lack of individual approach or critical appraisal. On the other hand, some of the reviews (I should particularly like to mention those by Irvine, Harris and Steward) might well serve as models for succeeding volumes. Nor can I resist the temptation, at this point, of referring to Rosenheim and King's matchless review of sterol chemistry which appeared in Volume III.

Aside from all this, for the reviewer to appraise critically the complete contents would indeed be presumptuous. Within the limits of his vision and his knowledge, the reading of this book has impressed him with a number of recent achievements. These may be gathered together in the form of the following statements: the importance of lyochromes and flavins in biological oxidations; a terminal methyl group oxidation of fats in addition to Knoop's β-oxidation; the further support of keto oxidation of amino-acids in the body by a study of tissue slices; the isolation, in crystalline form, of enzymes and zymogens; the synthesis of ascorbic acid; the influence of the pituitary and the adrenals in carbohydrate metabolism; the artificial production of the male and corpus luteum hormones; flavin as a constituent of vitamin B_2; the possible connection of vitamin B_2 and pernicious anemia; the intimate connection of phosphate with muscle activity; the "humoral transmission" at the nerve endings of the autonomic system; the production of methylcholanthrene, a carcinogenic substance, from deoxycholic acid, a bile acid; and β-indolyl-acetic acid as a plant hormone.

Impressed, also, is this reviewer with certain fields of biochemical research where, despite much activity, the results remain meager. I shall mention but three of these; the mechanism of insulin action; the creatine-creatinine situation; and the chemistry and metabolism of the brain.

Advances are often so rapid that we shall have to wait for the fifth edition for a record of some very recent achievements; such as the constitution of vitamin B_1 by Williams and Clarke; the synthesis of glutathione by Harington; the use of heavy hydrogen for the study of intermediate metabolism by Schoenheimer; the extensive use made by Bergmann and others of the former's elegant method for synthesizing various polypeptids; and the discovery of several male hormones by Ruzicka.

BENJAMIN HARROW
COLLEGE OF THE CITY OF NEW YORK

THE REPTILES OF CHINA

Natural History of Central Asia, Vol. X, The Reptiles of China. By CLIFFORD H. POPE, American Museum of Natural History, 1935, liii + 604 pp., 78 ill., map, 27 pl.

THE "difficulties and dangers" of faunistic work have been admirably met and coped with in Pope's splendid treatment of the 219 forms which make up the reptilian fauna of China. Four years of field work in China, seven months abroad examining Chinese material in European museums and assiduous study of the literature have enabled him to produce a work which is the best treatment of any reptilian fauna yet made and which immediately establishes the author in the front rank of living herpetologists.

The sixty-six lizards are considered in an annotated check list, with keys and synonymies. The twenty-two turtles and single alligator are given fuller treatment, and illustrated, either by new figures or by reproductions of those accompanying the original descriptions. The 130 snakes are given the same treatment as the turtles, with the addition of a great deal of very valuable and novel information on the maxillary dentition, the male sexual organ, sexual dimorphism, breeding habits, habitat and food preference. Wall's "Snakes of Ceylon" is the only comparable piece of ophiology, and Pope's treatment does not suffer by comparison with it.

There is an index, a list of localities, a guide map and a bibliography.

The reptilian fauna of the United States is roughly

comparable in size with that of China. Pope has, single-handed, done for China what has not yet been accomplished for the United States. Since our reptilian fauna is more similar to that of China than to that of any other Old World area, this book will be of great interest and usefulness to American students.

E. R. DUNN

HAVERFORD COLLEGE

SPECIAL ARTICLES

CAFFEIC ACID IN PRUNES AND ITS BEHAVIOR AS A LAXATIVE PRINCIPLE

IN studies on the laxative principle of prunes[1] it was observed that caffeic and chlorogenic acids caused an increase in tonus and amplitude of contraction of isolated rabbit jejunum or duodenum. This action was similar to that caused by various prune extracts.

In view of the forementioned results, an attempt was made to isolate chlorogenic and caffeic acids from dried Santa Clara prunes (Prune D'Agen) and determine their laxative actions. We were unable to obtain any indication of the presence of chlorogenic acid; however, caffeic acid crystals were obtained from the alkaline hydrolyzed water extract of prunes by the method of Plücker and Keilholz[2] and Freudenberg.[3] These crystals were definitely identified as caffeic acid by melting point, mixed melting point and elementary micro-analytical determinations. The latter gave C 56.75 per cent. and H 4.77 per cent. as compared with the theoretical values C 57.14 per cent. and H 4.76 per cent. Quantitative determinations indicate a concentration of about .03 per cent. caffeic acid in the whole dried prune. The variations in concentration of caffeic acid in prunes were not determined.

The source of caffeic acid in prunes is still uncertain. Since Kohman and Sanborn[4] reported the presence of quinic acid in prunes it was thought that the source might be chlorogenic acid, but, as already stated, this acid was not found to be present. Nierenstein[5] has suggested that these two acids are often combined in complex caffetannins.

Feeding tests with live rabbits, dogs and human subjects have failed to show any significant laxative effect, whereas in tests with isolated rabbit duodenum a slight change in tonus and amplitude was observed.

It is concluded that caffeic acid has been isolated from prunes and that it is not the substance responsible for the laxative action caused by the ingestion of prunes.

E. MRAK
J. FESSLER
C. SMITH

FRUIT PRODUCTS LABORATORY
UNIVERSITY OF CALIFORNIA

1 G. A. Emerson, *Proc. Soc. Expt. Biol. and Med.*, 31: 278, 1933.
2 W. Plücker and W. Keilholz, *Ztschr. f. Unters. der Lebensmittel*, Bd. 68, S. 97, 1934.
3 K. Freudenberg, "Tannin Cellulose Lignin," Julius Springer, Berlin, 1933.
4 E. F. Kohman and H. Sanborn, *Jour. Ind. Eng. Chem.*, 23: 126, 1931.
5 M. Nierenstein, "The Natural Organic Tannins," J. and A. Churchill, Ltd., London, 1934.

THE EFFECT OF THE PERFORMANCE OF PHYSICAL WORK ON MIMOSA

IT is recognized that physical work or exercise within physiological limits makes the muscles of animals stronger and more difficult to fatigue. This investigation was begun to determine what effect, if any, the performance of physical work would have on the susceptibility of the plant, Mimosa, to fatigue, as well as on its capacity to perform work. For this purpose seven vigorous potted greenhouse plants of *Mimosa pudica* were used. The plants were approximately 30 cm high and had been grown from seeds sown 10 months earlier. Two leaves of approximately the same size of each plant were selected. One of these leaves was made to perform physical work, while the other, which served as a control, was not. It should be mentioned in this connection that the experiments were carried out in a greenhouse maintained at a temperature of approximately 26–27° C. and under natural conditions of day and night in January and February when the days were around 10 hours in length and the nights 14 hours.

The method of making the leaf perform physical work or so-called exercise was to attach weights to the leaf and then stimulate by dropping a cylindrical piece of wood 30 mms long and weighing 90 mgs through a glass tube 25 cm long and striking the junction of the four primary leaflets, as shown in Fig. 1. This stimulus caused the leaf to drop and when the leaf rose during the succeeding 15 minutes physical work was performed by raising the weight. Knowing the extent of rise of the leaf and the weight of the load lifted, the amount of work done could easily be calculated.

The experiments were performed in the following manner. At 9 A. M. a 115 mg weight was suspended at the junction of the four primary leaflets to one leaf of each of the seven plants to be worked or exercised, and these were then stimulated and caused to drop as described above and shown in Fig. 1. During the