As an aid to further study along this line, small fish preserved in 10 per cent. formalin, from regions where mottled enamel is endemic, will be greatly appreciated.

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THE CYTOLOGY OF THE DIFFERENTIATING SPIRAL VESSEL IN RICINUS COMMUNIS

ALTHOUGH spiral vessels are probably considered the most commonplace elements in plant anatomy, I have been unable to find any detailed account of their differentiation. In spiral vessels the spiral thickening may extend uninterrupted throughout an entire developing internode. This continuity of the spiral appears comprehensible only if the spiral is laid down as a continuous unit, and is not a composite resulting from the fusion of spirals in vertically adjacent cells.

In *Ricinus communis* all stages of differentiation of the spiral vessels may be found. As soon as the future xylem elements, cut off from the cambium, begin to vacuolate, to expand and to elongate, the end walls of the vertically superimposed cells break down. The result is a coencyte traceable often throughout the entire length of the internode. The protoplasm is granular and is seen in all stages of vacuolation. The nuclei lie in vertical series numbering from ten to twenty and very often increase markedly in size. As is well known, the spiral thickening is laid down only when expansion is complete, and appears first as a faint unlignified cellulose band. Lignification follows, while protoplasm and nuclei remain intact and are observed in the fully differentiated element. The occurrence of the coenocytic phase of development explains the continuity of the spiral.

Further details of the process will be published shortly.

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MOTION-PICTURE SPEED NOMENCLATURE

DOES the translation of a simple, well-understood and widely used expression, "slow motion," into its Greek equivalent "bradykinetic" result in "a uniform terminology *which precludes confusion,*" as stated by Dr. Richards in SCIENCE for August 2, 1935, in the last paragraph of his article? Or does it result in the confusion evident in the immediately preceding paragraph, which states, "A *'bradykinetic'* film can not be obtained by *projecting* rapidly an 'isokinetic' film, *except within very narrow limits. . . .*"

Now any one mechanically inclined knows one can not obtain a slow motion picture by speeding up the projector, as the effect would obviously be the opposite of that desired. Would not this error have been noted by the proofreader if it was not "Greek" to him?

If the number of frames per second projected be placed over the number of frames per second photographed and the word "actual-speed" be added an expression will result that will be self-explanatory and give all the desired information at a glance. Example: "This is a 16/256 actual-speed film." This obviously means a sixteenth speed film and that everything moves in the projected picture at one sixteenth the speed the actual objects did. In a 16/8 actual-speed film they move at twice the actual speed.

MARTIN A. RYAN

BIRCH-BARK CANOES

I HAVE recently returned from Golden Lake, Ontario, where Indians still make birch-bark canoes for use, and sell them cheaper than factory-made canoes. They can make them for museum specimens without using such modern materials as nails.

Some museums may not know that such canoes are still made and available. Some owners of lakeside summer homes may not know that they can still get such canoes for use or merely as romantic lake-shore objects or lodge or dining-hall decorations, to be placed over mantels, etc.

I would be glad to help such museums and/or people to get in touch with Indians that I consider reliable, in order to help both parties concerned, especially as the Indian need of money and market would help keep alive a primitive North American industry.

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SCIENTIFIC BOOKS

BIOCHEMISTRY

Annual Review of Biochemistry. Edited by JAMES MURRAY LUCK. Vol. IV, Annual Review of Biochemistry, Ltd., Stanford University P. O., California, 1935.

THIS "Annual," now in its fourth year, has already taken its place as one of those indispensable books without which a biochemical library is no library at all. We biochemists are deeply indebted to Professor Luck, the editor of all four volumes, upon whom rests the main responsibility of production. Instead of covering each year the fathomless ocean known as bio-

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.

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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