reasons are twofold: (1) Frequencies of chromosome pairing and of kinds of configurations occur that can be predicted only on the assumption that chiasmata do *not* break in terminalization: (2) configurations occur in polyploids and structural hybrids that are only compatible with the alternative hypothesis that crossing-over has preceded (and determined) chiasma formation. Sax's genetical remarks might be taken to favor either hypothesis—for there is no decisive evidence between them. They are however vitiated as evidence by his using the word "chromosome" in three different senses, *e.g.*, p. 209, l. 25 to mean one chromatid, l. 27 (?) two chromatids, and l. 28, four chromatids.

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ADVANCES IN THE BIOLOGICAL SCIENCES

THE inclusion of the notes compiled by Science Service on the advances made in various branches of science during each year is a valuable feature of your paper. Permit me, however, please, to make a few comments on two of the 1930 items.

The tannic acid treatment of burns, originated by Dr. E. C. Davidson, of Detroit, was first published by him as far back as 1925. In 1929 the British Medical Research Council published a memoir by Mr. W. C. Wilson, of Edinburgh, and the results given in it "wholly confirm the claims made by Dr. Davidson for the tannic acid treatment."

Another item given in the 1930 list is the use of a neon lamp, connected in parallel with a condenser, to measure a small electric current. This device was applied by Dr. H. C. Rentschler, director of the research laboratories of the Westinghouse Lamp Company, to the measurement of the photo-electric current from a uranium cell, sensitive to ultra-violet light only. As far as I know his work was published during 1930. The same method, with minor differences, had, however, been published by Dr. J. H. J. Poole, of Trinity College, Dublin, in 1928, in the *Scientific Proceedings* of the Royal Dublin Society. When reading his paper before the society, Dr. Poole established that the rate of flashing was proportional to the photo-electric current from a sodium cell, and demonstrated the flashing to the audience by means of a two-valve amplifier, so that each flash was heard as a rap.

Through the courtesy of Dr. Poole I was able similarly to demonstrate the flashing in a course of lectures in London University in May, 1929.

At the joint discussion on photo-electric cells, held by the Physical and Optical Societies in London on June 4, 1930, J. H. J. Poole and H. H. Poole communicated a further paper on the neon discharge tube method, and gave the results obtained for the absorption coefficient of the water of Lough Bray, in the Dublin Mountains, during August, 1929. In the autumn of the same year Dr. H. H. Poole and the writer collaborated in the use of the method for submarine photometry. For this it has many advantages, as it integrates the current over a suitable time interval and permits one to obtain correct values in which the effect due to dancing of the waves is averaged out. About the same time, and since, we used the apparatus for measuring in various situations the color of daylight (and other light sources, carbon arc, etc.) with a photo-electric cell, and more recently for the study of a mercury vapor arc. Accounts of these applications are now in the press.

The method has many uses. It appears to have been invented by Dr. J. H. J. Poole, and later by Dr. Rentschler, quite independently.

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LITERATURE RELATING TO COD LIVER OIL

IN our recent "Report to the Empire Marketing Board on the Relative Values of Cod Liver Oils from Various Sources" (E. M. B. 35) an unfortunate blunder has arisen during the revision and proof-reading of the introductory chapter.

Reference 6 on page 9 is incorrectly given and should, of course, refer to the important paper by Professor Steenbock and his colleague Dr. Boutwell in the *Journal of Biological Chemistry* (1920, vol. 42, p. 131).

Immediately our attention was drawn to the error we wrote to Professor Steenbock expressing our great regret and, although he desired that we should give no further attention to the matter, we feel that we must override his wishes and make public our correction of the mistake.

On the same page the reference to Professor E. Mellanby's pioneer researches on the causation of rickets might suggest that his results were not published before 1921. We were, of course, well aware of his earlier contributions to the subject but thought it better, in a brief summary, to refer the reader to the full account of his earlier work which was published by the Medical Research Council.

[5] C. D. Darlington, "A Cytological Demonstration of 'Genetic' Crossing-over," *Proc.* Roy. Soc., 107: 50–59, 1930.

[6] C. D. Darlington, "Studies in *Fritillaria* III: Chiasma Frequency and Chromosome Pairing in *Fritillaria imperialis*," *Cytologia*, 2: 37–55, 1930.

[7] C. D. Darlington, "Meiosis in Diploid and Tetraploid *Primula sinensis*," *J. Genet.*, 24: 65–96, 1931.

[8] C. D. Darlington, "Meiosis," *Biol. Rev.* 6, (in the press).

[9] C. D. Darlington, "The Cytological Theory of Inheritance in *Oenothera*," *J. Genet.*, (in the press).

We would like to express our apologies to these distinguished investigators.

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INSCRIPTIONS FOR A SCIENTIFIC BUILDING

URSINUS COLLEGE is erecting a new building for instruction and research in the sciences. It will be a rather imposing structure for a small college. On the face of the building at either side above the front entrance inscriptions are to be cut. The space permits each text to consist of about seventy letters. They might be quotations or original compositions.

I am seeking suitable inscriptions and shall be under obligations to any reader of SCIENCE who may be willing to send suggestions.

GEORGE L. OMWAKE,
President
URSINUS COLLEGE,
COLLEGEVILLE, PENNSYLVANIA

SCIENTIFIC BOOKS

A History of Entomology. By E. O. ESSIG. The Macmillan Company, New York, 1931. 1,029 pp., $10.00.

DESPITE its inclusive title, this work treats primarily of the history and development of applied entomology in California. It is replete with valuable and interesting information on this and related subjects.

Should one insist on the definition of history as "a narrative of events," then some of the contents of the work could not qualify in that category. Nevertheless, the evidence of intelligence in the choice of material, the conscientious accuracy and completeness of the data included, and the evident effort of the author to render the work of the utmost use to the reader, all evoke his admiration and respect.

In perusing these pages, one is certain to be deeply impressed, too, with the early and leading part taken by the people of California in the advancement of applied entomology and its concomitant activities in America. Settled as it was, after the hegira of 1849, by a virile race of hardy pioneers, California's specialized forms of agriculture, which almost from the first have produced crops of high intrinsic value, together with the great wealth produced by the swift development of her mineral resources, soon gave her a surplus of vigor and power which account in large part for the courageous manner in which she has attacked not only her entomological problems but her civic and social emergencies as well. Thus she was the first of all the states (Howard[1]) to protect herself (in 1880) by legislation and quarantine against the introduction of new insect pests. And this is but one illustration of her forward-looking and aggressive spirit. Her leadership among the states, in the investigation of fumigants and chemicals for the destruction of insect foes, and her early successful adoption of biological methods of insect control, all evince the same qualities of vitality and courage as were exhibited so marvelously after the great earthquake and fire of 1906.

If, as seems possible, it be true that several serious insect pests such as the cottony-cushion scale, San José scale, black scale, etc., gained entrance to America through the activities of the early horticulturists of California, the world will learn through these recent expositions of entomological history that she has atoned nobly for such unintentional lapses by her innumerable valuable contributions to the control of these and of other insect pests for which she has been in no way responsible.

The opening chapter of the present work treats very briefly of the paleoentomology of California, while the second chapter is devoted to an entomology of the Californian Indians. This occupies some thirty-six pages and is of general interest but has a marked ethnologic flavor. After a few pages giving the general historical background, the origin and present status of the Californian institutions pertaining to entomology are related in which discussion the universities and colleges are given individual attention. Then follows a section comprising 192 pages, discussing the history of "The More Important Orchard Mites and Insects of California." With one exception (that pertaining to biography), this chapter is the longest in the book and is considerably more comprehensive than is indicated by its title. For instance, it includes important pests of forage crops, ornamentals, vegetables and even insects affecting health such as the fleas and some mosquitoes. A circumstantial account of the history of sericulture in California and a brief discussion of apiculture in the state conclude the chapter.

The matter is arranged ordinally, beginning with the Acarina, without regard to chronological sequence. A brief history of each species is given together with its common and scientific names. This often includes the formulae used in control, and numerous refer-

[1] L. O. Howard, "A History of Applied Entomology," Smithsonian Inst., Nov. 29, 1930.