greatest achievement is, after all, the part which it has had, together with other sciences, in transforming the way in which the world *thinks*. In its laboratory method it has replaced the old idea of authority by the idea of first-hand knowledge. It leads the individual to seek for himself the fundamental basis of his knowledge and it leads him not merely to pass that knowledge on to the next generation, but to transform it into a new and truer form. And as this scientific spirit permeates society it more and more destroys deceit and fraud, wherever found.

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Scientific Books

Foods and their Adulteration: Origin, Manufacture and Composition of Food Products, Description of Common Adulterations, Food Standards, and National Food Laws and Regulations. By Harvey W. Wiley, M.D., Ph.D. 8vo, pp. xi + 625. Eleven colored plates and 86 other illustrations. Philadelphia, P. Blakiston's Son and Co. 1907. Cloth, $4.00.

Seldom has a more timely book appeared than this, following so closely as it does the beginning of the enforcement of the new national pure-food law. For some time prior to the passage of this law public interest throughout the country had become vitally awakened to the importance of the pure-food issue. Amid a large mass of confusing and often exaggerated newspaper articles dealing with the subject, it is a comfort to find a book covering the field so completely, so sanely and withal in so interesting a way.

The book treats systematically and quite exhaustively of all the principal food products, dealing in turn with their manufacture, properties and composition, forms of adulteration and dietetic value, and including much information of a general nature concerning them. Beginning with the animal foods, it thus covers meats and the various meat preparations, fish, milk and its products and oleomargarine. Then follow the vegetable foods, cereals, vegetables proper, condiments, fruits, sugar, syrup, confectionery, honey, and finally infants' and invalids' foods.

Beverages are to be separately treated in another volume.

Though destined for a wide variety of readers, the book is apparently designed first of all for the benefit of the public, at a time when the public wants particularly to know about its food; and written as it is from a strictly scientific standpoint, yet in a popular way, by one who from long experience knows so thoroughly his subject, it will be widely read and to great advantage by the people as consumers.

Not only does the author cover the ground directly suggested by the title, but in a general and useful way gives throughout much information about food values and the use of food for bodily nourishment. The colored plates illustrating the appearance of cuts of healthy beef, for example, will be found especially helpful to the householder.

To the food manufacturer and dealer the book is almost indispensable, since it describes very plainly the methods of preparation and standards of purity, the effects of storage, and, in addition, gives much good and sound advice regarding what might be termed controversial forms of adulteration, such as chemical preservatives and artificial coloring, called controversial because their use with restricted labels has to some extent been legalized under some of the state laws, and because they have for years formed the subject of much difference of opinion among experts in food litigation.

In treating of these substances, the use of which unfortunately seems to be on the increase, and which form undoubtedly one of the most important phases of food adulteration, the author speaks in no uncertain way. He unequivocally condemns the use of chemical preservatives, such as boric, sulphurous and benzoic acids and their compounds, as in all cases deleterious to health, and would rigidly exclude them from all food products. Even saltpeter, so long used in the corning of beef, he regards as undesirable.

As to artificial colors, he would keep them

out of all foods, and with good reason, with the exception of confectionery and similar products, even regarding the time-honored custom of coloring butter as an attempt to deceive, which it certainly is.

In discussing baking-powder compounds and the toxic effect of their residues, a matter of much conflict in the past between legal experts, the author caustically points out how the interests of rival commercial companies often shape their views, and with justice recommends the investigation of such subjects by wholly unprejudiced observers, from a strictly scientific standpoint.

The author specifically states that in all cases the opinions expressed are strictly his own, and are not to be otherwise considered.

While the manual, by the author's statement, is not especially designed for the expert chemist, and chemical terms are carefully explained for the benefit of the public, yet the food analyst will need the book on his shelves for reference. From the chemist's standpoint, the many tables and results showing the composition of the various food products are especially useful for comparison. In many cases also are given some of the later and more improved tests for adulteration, which in some instances have not hitherto been so readily available.

Among these are the detection of yeast extract in meat extract, conclusions and results of constants for fats as a guide to adulteration of mixed meat products, the Wisconsin curd test for the purity of milk, methods for distinguishing between edible and poisonous mushrooms, etc.

In appendices are given in full the latest adopted standards of purity for food products, rules and regulations for the enforcement of the food and drugs act of 1906, the text of the act, regulations governing meat inspection, and finally the first sixty-four food inspection decisions rendered by the secretary of agriculture.

In appearance the book is very attractive with its large, clear type and well-selected colored plates and cuts.

First Course in Zoology. By T. W. GALLOWAY, Ph.D. Philadelphia, P. Blakiston's Son and Co.

Dr. T. W. Galloway has written a book which, as is stated on the title-page, is designed for "secondary schools, normal schools and colleges." The work is divided into two main parts, the first dealing with the broad general principles of zoology, the second consisting of a systematic review of the animal kingdom. After a short introductory chapter concerned chiefly with the principal subdivisions of the science there are chapters on the nature and functions of protoplasm, the structure and physiology of the cell, the development of the cell into a complex animal, the differentiation of cells and tissues, and the general animal functions, such as digestion, respiration, excretion, sensibility and reproduction. Chapter VII., headed by the unfortunate term promorphology, deals with the various types of symmetry exhibited by animals and the metameric composition of the body in segmented forms. In chapter VIII. under the title Individual Differentiation and Adaptation, there is discussed a variety of topics such as heredity, variation, selection both natural and artificial, adaptation to the environment organic and inorganic, classification, habit and instinct, social and communal life, symbiosis, parasitism and the general subject of distribution. The treatment of many subjects necessarily suffers from being confined to the limits of a short paragraph, notwithstanding the fact that the exposition on the whole is logically developed.

The systematic survey of the animal kingdom is preceded by a short chapter designed to give the student a general concept of the field, and containing a useful diagram of the numerical proportions of species in the different phyla. The description of the main groups of animals is usually introduced by laboratory directions for the study of a typical form. When the student has made this study he is prepared to assimilate the additional information given in the text upon the type and other members of the group. The laboratory directions are not so explicit as in most laboratory manuals. They form a series of hints and

suggestions rather than fixed outlines which can be slavishly followed. The purpose of this is to enable the teacher to modify and direct the work in large part according to his own ideas, as many teachers would naturally desire to do. Opinions may differ as to the feasibility of this mode of presentation. More responsibility is placed on the teacher as well as more labor, and the method may be better or worse than the usual course of laboratory outlines, depending on the qualifications of the person giving the course.

A part of the work is printed in larger type for students who have time for only a limited course in the subject. At the ends of the chapters there is a series of topics and questions for additional investigation in the laboratory, field or library. The book which consists of 481 pages includes sufficient material to keep an average class busy for two or three years, but the teacher is expected to select from it what he deems suitable for the conditions he has to meet. It is a work which stands in marked contrast to many of the infantile treatises which have recently appeared and which religiously abstain from including anything which is liable to tax the gray matter of the student. It is evident that a good deal of thought and effort have gone into its making, and it has consequently a degree of character and individuality which is rare among the members of its genus.

The price, $2.50, may unfortunately tend to limit its use in secondary schools, but the general make-up of the book is excellent, and it is well illustrated with 240 figures, many of which are new. S. J. H.

SCIENTIFIC JOURNALS AND ARTICLES

The American Naturalist for October is mainly devoted to the third of a series of "Studies of Gastropoda," by A. W. Grabau, this being "On Orthogenetic Variation in Gastropoda." The author notes the general disregard of the immature stages of development, and considers this a decided mistake. He also points out that the mollusks are perhaps the best organisms for the study of ontogenetic stages between the embryo and the adult, since these stages are permanently recorded in the shell; he also considers the gastropods the best for study. J. A. Allen discusses "Mutations and the Geographic Distribution of Nearly Related Species in Plants and Animals," pointing out that the different views held by botanists and zoologists are partly due to too sweeping assertions, partly to misunderstandings and partly to deductions drawn from dissimilar conditions. Under "Notes and Literature" is a detailed account of the various and important exhibits made at the meeting of the Seventh International Zoological Congress.

Bird Lore for September-October has the second, and final, article by F. H. Herrick on "Bird Protection in Italy as it Impresses the Italian." Roughly speaking, protection seems to impress him as eminently undesirable and that the more of his own and his neighbor's birds that can be killed the better. It is this feeling that leads to so much trouble between our Italian immigrants and game wardens. W. W. Cooke has the fifth, final and very brief paper on "The Migration of Thrushes," and there is considerable information regarding "The Starling in America," showing that it has commenced to spread. There are quite a number of communications, some favorable in tone, on the English sparrow. The report of the Audubon Societies records the establishment of two more bird reservations in the Gulf of Mexico, and contains encouraging reports of those already established.

The Bulletin of the Charleston Museum for October contains a paper by William G. Mazyck on the "History of the Museum" previous to 1798, showing that it was in existence even prior to 1778. Under Ornithological Notes is recorded the first capture of Bewick's wren, *Thryomanes bewicki,* on the coast of South Carolina.

The Museums Journal of Great Britain for September contains an article on the Malmo Museum which contains many picturesque groups of animals, although there seems to be a tendency to show rather too much of the cruel side of animal life. In the notes it is stated that the resignation of E. Ray Lankester as director of the British Museum has