

have confidence in the ability and integrity of their informants, and here it becomes the duty of our technical colleges to train their students to take the positions in the world of industry which will qualify them in their several stations to fully serve their country as fountains of truth.

In conclusion, let me quote a passage from an address by that ardent champion of truth, Thomas Huxley, delivered in 1880, upon a somewhat similar occasion to the present, namely, the opening of the Technical College in Leeds.

* * * It is not beside the mark to remind you, that the prosperity of industry depends not merely upon the improvement of manufacturing processes, not merely upon the ennobling of the individual character, but upon the third condition, namely, a clear understanding of the conditions of social life on the part of both the capitalist and the operative, and their agreement upon common principles of social action. They must learn that social phenomena are as much the expression of natural laws as any others; that no social arrangements can be permanent unless they harmonize with the requirements of social statics and dynamics; and that, in the nature of things, there is an arbiter whose decisions execute themselves.

But this knowledge is only to be obtained by the application of the methods of investigation adopted in physical researches to the investigation of the phenomena of society. Hence, I confess, I should like to see one addition made to the excellent scheme of education propounded for the college, in the shape of provision for teaching sociology. For though we are all agreed that party politics are to have no place in the instruction of the college; yet in this country, practically governed as it is now by universal suffrage, every man who does his duty must exercise political functions. And, if the evils which are inseparable from the good of political liberty are to be checked, if the perpetual oscillations of nations between anarchy and despotism is to be replaced by the steady march of self-restraining freedom, it will be because men will gradually bring themselves to deal with political, as they now deal with scientific, questions; to be as ashamed of undue haste and partisan prejudice in the one case as in the other; and to believe that the machinery of society is at least as deli-

cate as that of the spinning-jenny, and as little likely to be improved by the meddling of those who have not taken the trouble to master the principles of its action.

ALEX. C. HUMPHREYS.

SCIENTIFIC BOOKS.

Entomology, with Special Reference to its Biological and Economic Aspects. By JUSTUS WATSON FOLSOM, Sc.D., Instructor in Entomology in the University of Illinois. Philadelphia, P. Blakiston's Son and Co. 1906. \$3.00.

There is supposed to be a growing demand for a biological treatment of entomology, and two notable efforts have recently been made to meet it. Professor Kellogg met it in his 'American Insects' by adding to the systematic treatment of the older standard texts (which he incorporated *in toto*) a few chapters on color, insects and flowers, insects and disease, etc., making a very big book of the encyclopedic sort. Dr. Folsom has followed the plan of cutting down to an almost negligible quantity the systematic part, giving a condensed résumé of anatomy, physiology and embryology, and devoting the greater part of his book to the discussion of general biological phenomena, making it a reading book of comfortable size. Thirteen pages of systematic description of the orders serve to eliminate that part of the subject (which, according to the preface, is thus summarily dealt with because of its prominence in other available texts). The condensation is at its maximum in the description of the larvæ of the orders, for which purpose two words, *thysanuriform* and *eruciform*, suffice. The theoretical significance of these terms is explained in the chapter on development: but here in the descriptive part they are very much over-worked. To say merely that the larvæ of the Odonata are *thysanuriform* is certainly not very illuminating. Only with the mind's eye could one see, for instance, anything *thysanuriform* in the larva of *Hagenius*.

The chapters on morphology and development (158 pages) are concise, well digested and altogether excellent, and taken in connection with the well-selected bibliography at the

end of the book, furnish a good introduction to these subjects.

Then follow the chapters embodying the 'biological treatment' comprising the greater part of the text (183 pages). Their titles are the following: Adaptations of Aquatic Insects, Color and Coloration, Adaptive Coloring, Origin of Adaptations and of Species, Insects in Relation to Plants, Insects in Relation to Other Animals, Interrelations of Insects, and Insect Behavior. While these subjects are not new to entomological text-books, they are here given a new treatment and merited prominence, and entomologists will appreciate having them brought together for discussion in one place.

Then follow chapters on Distribution, and on Insects in Relation to Man, the latter being a discussion of the mission of the economic entomologist and a historical sketch of the evolution of that species in America. The economic entomology of the book is mostly in the title, where it, perhaps, serves the publisher's purpose. There is no mention of many of the most important economic species, nor of the most important methods of economic procedure. The book concludes with a good bibliography, of 57 pages.

The typography and press work are excellent. Mistakes are few; but in the short chapter on adaptations in aquatic insects the following are noted: The figure of the hind leg of the diving beetle *Cybister* on page 187 fails to show the inferior spur greatly widened—the character by which this genus is most readily recognized; the figure of *Simulium* larva on page 190 does not show the anal gill tuft, although illustrating a paragraph on gills; it is doubtless by oversight that the larvæ of Ephemeridæ are mentioned on the same page along with those of the Odonata as having a highly developed rectal respiration. The style is never prolix, and although verbal infelicities are rather too frequent, the meaning is rarely obscure. The illustrations are always appropriate, and generally of a high order. The book as a whole is excellent, and will be most useful to the general student.

J. G. N.

The Elements of Geology. By WILLIAM HARMON NORTON. Ginn and Co. 1905.

This volume has been written, the author tells us, to fill the need of a text-book that shall knit cause and consequence in geology together, 'to treat land forms and rock structures in connection with the geologic processes causing them,' abandoning the traditional division of the subject into departments, dynamical, structural, physiographical and historical. As a matter of fact, he preserves the last of these, so the new departure must be looked for in the rest of his book, 'External Geological Agencies and Internal Geological Agencies.' We readily obtain an idea of the treatment attempted by comparing Professor Norton's book with a well-known predecessor. For this I have put equivalent parts of LeConte's text-book and this on the same lines of parallel columns. It thus appears that our author has omitted the 'Structural Geology' and some of the 'Organic Agencies' and put the rest under slightly different heads:

Norton.	LeConte.
I. External Geological Agencies.	I. Dynamical Geology.
II. Internal Geological Agencies.	{ 1. Atmospheric Agencies.
(Touched in I.)	{ 2. Aqueous Agencies.
(Touched in I. and II.)	3. Igneous Agencies.
III. Historical Geology.	4. Organic Agencies.
	II. Structural Geology.
	III. Historical Geology.

Of LeConte's organic agencies, peat is described by Norton under river deposits, lime accumulations under offshore and deep sea deposits, and the bog ore, silicious and phosphatic deposits that get a brief mention in LeConte are not here referred to.

Of the structural geology, general form and structure of the earth are omitted as far as I have been able to learn, sedimentary rocks are treated in several places, one half page in the Introduction, five pages in the Work of the Weather, twenty pages in Offshore and Deep-sea Deposits, six pages in River Deposits and about three pages in the Work of the Wind. Igneous and metamorphic rocks are treated under internal agencies, joints under the work of the weather and movements of the earth's crust, faults under movements of the earth's crust, mineral veins under work of ground water and metamorphism and mineral veins,