

species; 15 of these are regarded as accidental or occasional stragglers from the ocean, 85 are small inedible species, and 41 are marketable forms. Of the last named, the most numerous and commercially important family are the Pleuronectidæ, 18 species being recorded and noted in detail.

The constitution and work of the sea-fisheries committees are referred to at length. These committees are analogous to the State fish commissions of the United States, but their organization and methods are very different. They are all subordinate to the national Board of Trade, but are vested with large powers in matters of legislation, regulation and investigation; and their work has a number of features that our local fish commissions could consider to advantage. The entire absence of artificial propagation of fishes and other animals is in strong contrast with other countries. Two appendices contain a full draft of the by-laws proposed for the Lancashire and Western sea-fisheries district, and a detailed statement of the results of experimental dredge-hauls, fishing trials, etc. The gathering of shrimps, one of the leading fishery industries of the Irish Sea, is shown to have a remarkable influence on the abundance of fishes and is one of the subjects in dealing with which the services of the biologist have proved most useful. From numerous test trials, it has been demonstrated that shrimping on certain grounds at certain times is enormously destructive to immature fish, as many as 10,000 undersized fish sometimes being killed in taking one quart of shrimp, and the average destruction per quart is said to be 1,000 fish, chiefly pleuronectids.

This memoir constitutes an admirable model for future investigations and reports of its kind. As an example of the harmonious combination of the scientific and the economic, the work will be welcomed by all persons interested in the preservation of one of the most valuable resources of the world. The most useful purpose the work ought to subserve, however, aside from its local application, is the demonstration (1) of the many diverse considerations underlying the regulation and administration of the fisheries, (2) of the neces-

sity for scientific methods in the proper study of economic problems, and (3) of the futility of radical legislation affecting the fisheries without competent biologic investigation. Many fishery laws which have suppressed or seriously disturbed established industries would never have been enacted had the facts been known; and, on the other hand, some languishing fisheries would be improved and failing resources replenished if legislators would heed the results of scientific investigation.

H. M. SMITH.

*Studies from the Chemical Laboratory of the Sheffield Scientific School.* Edited by HORACE L. WELLS. Vol. I., pp. xi+444; Vol. II., pp. ix+379. New York, Charles Scribner's Sons. 1901.

These volumes appear among the Yale Bicentennial Publications, issued 'as a partial indication of the character of the studies in which the university teachers are engaged.' They furnish a continuous record of recent progressive studies bearing directly upon questions of prime importance at the present time. Certainly they constitute a body of contributions to knowledge highly honorable to the university they represent.

Volume I. opens with a very brief historical account of the Sheffield Laboratory from the beginning, then presents a bibliography of the research publications of the present instructors of the laboratory, and gives in 427 pages the papers of the last ten years on 'General Inorganic Chemistry' and on 'Double Halogen Salts.' Volume II. gives in 371 pages the papers of ten years upon 'Organic Chemistry.'

Well known to chemical readers as these papers have been, there is now much advantage in having them all together in the order in which the investigations have developed. The chemists of the Sheffield Laboratory are to be congratulated upon the prevailing unity and continuity of their labors, extending through so eventful a decade.

The twenty-seven papers upon 'Double Halogen Salts' appeared from 1892 to 1901. Of all the known double halides classified by Professor Wells it is stated that about one third have been prepared in the Sheffield Labo-

ratory. In the determination of the constants of these compounds a great deal of foundation has been laid. So far, it may be said, the facts serve quite as much to do away with false generalizations as to support true ones. Perhaps the results reach toward that borderland of residual affinity which Werner and others have been cultivating. At any rate, whatever is gained in real knowledge of halogen combination touches chemistry everywhere, on inorganic, organic and physical lines, either in elucidation or in restriction of our theories of atomic union and our views of the periodic system.

There are several papers upon perhalides of the metals in the division of 'General Inorganic Chemistry,' and several upon organic perhalides in the 'Organic Chemistry' volume. In the same relation may be included the researches upon double salts and metallic salts of the anilides, and those upon the substitution of one halogen for another in the anilides.

The article on the 'Periodic System and Inorganic Compounds' gives a much needed discussion of the thesis that 'the nature of the compounds of an element is also a function of its atomic weight,' and then goes on to report the results of very faithful experimentation upon the alums, in respect to solubilities and other features. It is to be hoped that Dr. Locke will continue his researches in this field, important as it is, and calling for a special allowance of the scientific spirit, evident in his work.

The papers in the volume on 'Organic Chemistry,' familiar as they are to chemical readers, now present a quite logical series of cognate investigations, largely upon the anilides and related imido compounds. Very few of the papers deal with compounds destitute of nitrogen. It is not too much to say that the chemical literature of the bodies just mentioned, as well as that of many formyl compounds, and a good number of imido esters, has been of late years materially enriched by these contributions. The same may be said of the literature of the esters related to carbamic acid and urea. And further experimentations upon ester derivatives of urea are ap-

pearing under the name of Professor Wheeler in the journals current since these volumes were issued.

The recent records of the chemistry of Yale are of the greater educational interest because of the early development of the science in the same institution. The account given in Volume I. of the establishment of the Sheffield Laboratory is a good bit of history rescued from the recollections of a very early chemical period. It appears that, as a university laboratory distinctly for students, it was established in 'the old President's house' from 1847 to 1860. The data are well worth saving, for the history of the laboratory method, and to help out what may be gathered from the biography of the elder Silliman, and the sketches of American chemists collected by the younger Silliman in 1876. ALBERT B. PRESCOTT.

*The Foundations of Geometry.* By DAVID HILBERT. Authorized translation by E. J. TOWNSEND, Ph.D., University of Illinois. Chicago, The Open Court Publishing Company. 1902. Pp. vii+132.

The merest justice calls for a pointing out of some few among the blemishes in what Professor Townsend puts forth as a translation of Hilbert's beautiful 'Festschrift.' These blemishes are the more indefensible because Professor Townsend had before him, in addition to the limpid original, the admirable French translation of L. Laugel.

To begin with, Hilbert, so studiously sparing of words, uses the word *Erklärung* nine times on his first thirteen pages.

Townsend never renders it at all. Thus Hilbert's profound and elegant distribution into definitions, conventions, assumptions and theorems is totally lost, not appearing in Townsend's translation.

In the third sentence of the introduction *Aufstellung* is translated choice, and in the fifth sentence *aufzustellen* is given as 'to choose.' In the note to the introduction, 'instructive account' is rendered 'explanatory report'!

In § 1, p. 3, the point is missed when *erfolgt* durch is rendered 'follows as a consequence of.'