

that national societies address their own members through their own journals.

In so far as my note on medical licensure of non-medical doctors offends the medical profession, it does so because the facts therein set forth are *per se* offensive. That is incidental. It was an important object I had in mind. That object was to warn the non-medical doctors and other parties at interest in all of the States to watch their legislatures. This warning will bear repetition.

No one can deny the existence of House Bill No. 348, upon which my warning rests. No one who is informed can deny that this bill was backed by certain groups of physicians. No one can deny what the wording of the bill meant. Some of us discussed this with lawyers and also entered into conference with physicians here in Philadelphia. In these conferences it was found impossible to get the physicians to agree to a re-wording that would be mutually satisfactory. When the physicians who were conferring upon the bill here in Philadelphia finally (at a conference I attended) passed a motion to drop the bill, it appears that the physicians in Pittsburgh who were similarly interested in the bill refused to drop the bill. The bill had to be "killed in Committee" (in the House of Representatives). Possibly no one who read my paper knew that the effective quotations were from the pen of the physician who acted as chairman at the conferences I know about in Philadelphia and who spent time upon the re-wording of the bill itself. Had Dr. Woodward known this he would not have asserted that these quotations represented *merely* the views of individuals.

Who called into being this committee of physicians in Philadelphia, and who advised them? Who wrote the bill? It was legally unnecessary. It was needlessly offensive. It was thoroughly un-American. The men who did these things should ponder Dr. Woodward's well chosen words: "It would be unfortunate, indeed, if indiscreet utterances on the part of any one should hinder the movement. . . ." But if Dr. Woodward meant me, I do not think his remark fits. My warning has probably hastened the advance of the movement by bringing the matter well out into the open and by purging it (let us hope) of certain intolerable features.

Legislatures have to be watched. Witness the passage of a law in one of the States forbidding the teaching of evolution. If this be taken as an example of a response to a misguided majority, then my warning gains force. For we found that the number of physicians in Pennsylvania alone is about the same as the total number of chemists who are members of the largest association of chemists in the United States. Those of us who are not physicians must have ready other arguments than that of the wish of the majority when this matter comes into the several Legislatures. My warning note in your columns is certainly timely;

it contains facts that will bear the closest scrutiny; and it is not intentionally offensive.

DAVID WILBUR HORN

Chairman, Committee on Legislation, Philadelphia Section of the American Chemical Society

QUOTATIONS

SCIENCE IN THE MAKING

At Liverpool yesterday there came to an end a meeting of the British Association that will long be remembered as a definite stage in the making of knowledge. This annual congress of science has two chief functions—propaganda to the public and the advancement of knowledge. The face turned to the public was respectable enough. As usual, some of the more distinguished lights, and perhaps the greater part of the minor speakers, showed little talent for public speaking. They entangled themselves in the threads of their own arguments, like dancers in the colored ribbons of a carnival, turned their illustrations into obscurities, or took so long in saying that their time was too short that it left them time for little else. It is not ungracious to insist on a defect that could be remedied by taking pains; oratory is not required, but only a careful and orderly presentment of the subject such as most of the foreign guests, even those who had to grapple with an alien tongue, contrived to exhibit, in marked contrast with the body of our native speakers. There were, moreover, a few contributions that did not add to the dignity or to the effectiveness of the meeting. It may be difficult for a polite chairman to suppress speakers who are plainly in quest of self-advertisement, but there are committees with the function of accepting or rejecting proffered formal communications, and the council would do well to remind some of these of their duties. But in the proceedings generally there was more than sufficient to persuade laymen that science had a living spirit and was a high stimulus to the mind as well as a rich provider of material advantages. From these points of view the less formal addresses to members of the association and others in Liverpool and to citizens in adjacent towns deserved unusual commendation.

The internal work of the sections, the actual congress of those engaged in research, can not be judged by the public attention it received, perhaps, indeed, might be estimated more correctly in inverse proportion to the possibility of reporting it in a form of interest to the general reader. Even such sections as geography, anthropology, economic science, psychology, education and agriculture, apt to attract communications which sit uneasily in the category of science, also accomplished some useful work and gave real students the opportunity of distinguishing between opinion and knowledge. The geologists, ably led by their president, whose address was a model of

hard technical argument, discussed some of the difficult problems in stratigraphy and metamorphosis presented by local formations. The zoologists, amongst whom the presence of students and the younger generation of workers was notable, were also occupied chiefly with strictly technical matters, in which the conjunction of laboratory workers, museum systematists, and those who deal with living animals at sea or on land was very advantageous. In engineering also there was a useful collaboration of the "practical" and the theoretical sides, of the laboratory and the workshop. The physiologists made several concessions to publicity well justified by the contemporary importance of such subjects as diabetes and cancer, but they also had a valuable discussion with the chemists and physicists on the extremely important recent advances in knowledge of the physics of living membranes described by the chemical president in his address. By general agreement the proceedings in the section of botany were of unusual scientific value, although they were of a kind for the most part difficult for laymen.

But the meeting of 1923 owes its success above all to its achievements in physical science. On the borderland of chemistry and physics theories are pressing on each other concerning the material stuff of the universe. A single instance may serve to explain the general trend of the new knowledge. Although for long it has been suspected that the elements were built up of common units differing in number and arrangement, the fractional quantities assigned to them by the most careful observation seemed to forbid the existence of any simple relationship. Professor Soddy and his fellow-workers have now shown that the atomic weights are a mere statistical average, representing the proportions in which substances not hitherto suspected to have separate existences are found mingled in nature. The elements themselves are simple multiples of a common unit. And so in various ways older complexities are being resolved in what are at once higher and simpler unities. Chemical, physical, electrical and magnetic properties are all being reconciled as expressions or presentations of more fundamental properties of more elementary constituents of matter. Nature is turning out to be articulated, built of unit pieces, and these in their mass, size and movements are comparable with the phenomena of light, at present the ultimate and most nearly absolute standard of the universe. The vital interest of the proceedings at the Liverpool meeting of the British Association lay less in the announcement of completed results to the public than in the actual shaping of knowledge in an assemblage of leading physicists and chemists from almost every country in the world under the honored presidency of Sir Ernest Rutherford.—*The London Times*.

SCIENTIFIC BOOKS

Mathematics. By DAVID EUGENE SMITH. Marshall Jones Company, Boston, 1923, pp. x + 175.

THIS interesting little volume belongs to a series bearing the general title, "Our debt to Greece and Rome," edited by George Depue Hadzsits, University of Pennsylvania, and David Moore Robinson, Johns Hopkins University. An announcement appearing at the end of the volume gives 50 titles of the series together with the names of the authors in most cases. The present volume contains a brief introduction by T. L. Heath, who is well known on account of his extensive contributions to the history of Greek mathematics. Its four main divisions bear the following headings: Preliminary survey, the contributions in details, influence of the contributions, and conclusion.

The volume gives a very appreciative popular account of the mathematical contributions by the Greeks and the Romans, and brings out a number of historical facts which are not usually found in a history of mathematics. Hence, it will doubtless be read with profit by many mathematicians as well as by others to whom its popular style and very meager use of technical mathematics should appeal strongly. Mathematics has been called a Greek science, not only by those who find it difficult but also by those who are in position to understand its nature and who are familiar with the fundamental contributions of the Greeks along this line. It should, however, not be assumed that the Greeks developed the greater part of the mathematics of our times. They merely made a good start along certain important lines.

The reader who is mainly interested in actual facts relating to the contributions by the Greeks and Romans might sometimes wish that our author had not made such free use of the hyperbole. For instance, on page 90 we read: "In the first place we owe to the ancients our technical vocabulary, not merely that of mathematics in general and of notation in particular, but that of all the sciences"; while on page 160 we find the following sentence, "It is quite possible that our indebtedness in matters of notation and symbols is not great, and this should be frankly admitted." On page 114 we are told that Fermat was "the greatest genius of modern times in the theory of numbers," and on page 120 it is stated that "with respect to our indebtedness to Euclid, our modern text-books in mathematics are modeled primarily upon his works." This statement may profitably be compared with those relating to the modern tendency towards arithmetizing mathematics.

A question of a more serious nature may be raised as regards the mathematical contributions of the Romans. Our author emphasizes the fact that the Romans contributed practically nothing towards the