It is interesting in this connection to reread the resolution passed by the American Association for the Advancement of Science[1] on "Intellectual Freedom":

> We regard the suppression of independent thought and of its free expression as a major crime against civilization itself. Yet oppression of this sort has been inflicted upon investigators, scholars, teachers and professional men in many ways, whether by governmental action, administrative coercion, . . .

S. C. BROOKS

UNIVERSITY OF CALIFORNIA

MATHEMATICS IN A NUTSHELL

ONE of the prominent features of the recent mathematical developments in our country is the rapid increase in very brief mathematical text-books which are largely intended for the use of students in the army and the navy. While these text-books may serve an actual need it should be remembered that they do not conform with the real nature of mathematics, which involves an unrestricted inquiry into the mathematical elements of our surroundings. Even the large text-book fails to give full freedom to the inquiring student, but it does not impose as many restrictions as the smaller text-book, where the arousing of interest along one line of thought is too rapidly followed by a change of subject.

Unfortunately, there is a tendency to imply that the small text-book contains all that is really important in regard to the subject under consideration. A somewhat extreme instance of this kind appears on page 418 of E. T. Bell's book entitled "The Development of Mathematics" (1940), where it is stated that "in permutation groups, for example, the first week of school algebra will give the prospective calculator all the manipulative skill he needs." Manipulative skill is often a great asset to the mathematician and after it has been acquired one often wonders why it took so much effort to acquire it, but it is unfortunate to understate the actual situations. Its acquisition usually requires persistent efforts on the part of the beginner, as has been experienced by many.

In view of the recent tendency to begin with a very brief text-book on a mathematical subject and to follow it later with a more advanced treatise it may be desirable to refer here to a subject where the opposite procedure was followed and to note some of the advantages which resulted therefrom. In 1870 there appeared under the title "Traité des substitutions" the first text-book on the theory of permutation groups. Its size of xviii + 667 large pages is the more remarkable in view of the fact that when it appeared much less was known about this subject than is known at the present time. Not only was it the first text-book on the subject of permutation groups, but it was also the first text-book on the subject of groups in general or any part thereof, and it therefore exhibits the modernness of this subject.

As late as 1926 the widely known mathematician, Felix Klein, said on page 338 of his "Entwicklung der Mathematik," volume I, that Camille Jordan traversed, in particular, all of algebraic geometry, number theory and function theory to find interesting examples of permutation groups which he then embodied in his text-book. The great wealth of material thus obtained is an important element of the history of group theory and explains to some extent why this subject gained so rapidly in prominence during the latter part of the nineteenth century when American mathematical contributions began to receive wide European recognition largely as a result of the foreign training of their authors.

Hence the extensive introductory text-book on a mathematical subject may also render very valuable service and one may wonder whether our modern tendency towards the very brief mathematical text-book for the beginner is a wise one. At any rate, it may be of interest to observe that a subject which gained so rapidly in the appreciation of the mathematical public as group theory did was introduced in a different way in recent times. It is possible that in the very brief mathematical text-book the student loses too much of outlook for the sake of avoiding difficulties and this outlook is often more inspiring than the simplicity which the very brief text-book usually provides. Many students are not averse to difficulties provided they are surmountable, and it seems worthwhile to make the effort to surmount them.

G. A. MILLER

UNIVERSITY OF ILLINOIS

SCIENTIFIC BOOKS

CITROLOGY

The Citrus Industry. Volume I. *History, Botany and Breeding.* Edited by HERBERT JOHN WEBBER and LEON DEXTER BATCHELOR. Pp. 1028. 233 illustrations. University of California Press. 1943.

DR. WEBBER, when teaching citriculture in the College of Agriculture at Berkeley, planned to write a one-volume text-book. For four years he worked on this, but his notes and manuscripts were lost in the big Berkeley fire in 1923. Two years later he was transferred to the Citrus Experiment Station at Riverside, and returning to his project of a book came

[1] *A.A.A.S. Bulletin,* Vol. 2, January, 1943.