but not KI and NaCl. In Table 2 a few carbonates and about 35 silicates are included among the oxides. Several formulas and names are listed without data. No explanation is offered for this seemingly capricious coverage.

This compilation may prove useful to those who work within the undefined limits of its particular range and do not require such comprehensive and authoritative treatment as that given by the new edition of *Crystal Data*, recently reviewed in *Science* [**140**, 1230 (1963)].

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Mathematics

Mathematical Discourses. The heart of mathematical science. Carroll V. Newsom. Prentice-Hall, Englewood Cliffs, N.J., 1964. x + 125 pp. Illus. $5.

Topics in Modern Mathematics. Ralph G. Stanton and Kenneth D. Fryer, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1964. xii + 187 pp. Illus. $5.95.

Although a few of the same topics are discussed in both of these books, the books were written with very different purposes in mind. Carroll Newsom's *Mathematical Discourses* is an attempt to explain to the layman what a deductive, or axiomatic, system is. (Why the author prefers the name "mathematical discourse" is not clear.) *Topics in Modern Mathematics*, edited by Ralph Stanton and Kenneth D. Fryer, is intended chiefly for high school teachers.

In the first three chapters of *Mathematical Discourses*, Newsom discusses the historical development of the concept, in the fourth he gives several examples, listing the axioms and proving a few theorems, and in the fifth he discusses the use of axiomatic systems in dealing with practical and scientific problems.

I do not think the book successfully achieves its aim. The historical parts are superficial, with far too many names and dates, some of them unimportant. The style is heavy—for example, "utilize" is preferred over "use," and there is the strange expression (page 93) "by actually indulging in the process of division," which is apparently not intended to be humorous.

What is more serious is that there are a good many mathematical statements which will confuse or be meaningless to the average reader. One example is on page 93: "Interestingly enough, one may write, 1 = 0.99999 . . . and 23 = 22.99999. . . ." There is no explanation. In the discussion of the postulates for a complete ordered field (pp. 96–102), it is not pointed out that the subset P is the set of positive real numbers. Finally, some of the proofs are probably too difficult for the readers for whom the book was intended.

Topics in Modern Mathematics contains ten independent chapters with the following titles: "Groups and fields," "Set theory," "Boolean algebra," "Logic and computing," "Vector spaces and matrices," "Numerical analysis," "Functions of a single variable," "Fundamental concepts of calculus," "Probability theory and statistics," and "Some types of geometry." There is an epilogue, in which the editors express their misgivings about many aspects of the current curriculum reform in American high schools.

Most high school teachers could profit from reading this book. Many topics are discussed which they will soon be teaching, if they are not already doing so. However, there is, unfortunately, not a single chapter about which I do not have serious reservations. The treatment simply does not have the accuracy and clarity required in a book of this sort. It is impossible, in a brief review, to argue the point in detail, but perhaps the following examples will show what I mean.

The discussion of the null set (p. 20) does not make it clear that what is involved is merely a convention. The proof that 3 has no rational square root is not complete. In a discussion of the vector space of ordered pairs of real numbers (p. 68), it is stated that addition and scalar multiplication will be defined and then a zero vector will be selected; we have no choice, of course. The relation between 2 × 2 real matrices and the transformations of a plane into itself is discussed (pp. 72–75), but the fact that the transformations are linear is not mentioned. In a discussion of scalar multiplication (p. 78), it is claimed that (a, b) and $\lambda\ (a, b)$ have the same direction; on the next page there is a simple error in algebra, which is the result of the same disregard of signs. We are told (p. 78) that in a later section it will be proved that 0/0 can have no meaning, but that at the moment it is enough to notice that it certainly differs from the quantity 14/9. The list of Hilbert's undefined relations for geometry (p. 167) includes three that do not belong there.

My list of examples is far from exhaustive, but perhaps it is enough to show why I do not think the book should be used in training high school teachers.

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Satellite Geodesy

The Use of Artificial Satellites for Geodesy. A symposium held at Washington, D.C., in April 1962. G. Veis, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1963. xii + 424 pp. Illus. $14.

This collection of papers that were presented at the first international symposium on the use of artificial satellites for geodesy gives evidence of the wide range of talents that are necessary to exploit the new area of satellite geodesy. The invited papers were augmented by a considerable number of contributed papers, in order to provide more complete coverage of the subject matter. George Veis, the editor, has succeeded in arranging the material with as much continuity as can be expected in a collection of individual papers, written by more than 50 of the most knowledgeable but, nevertheless, highly specialized authors.

The well-rounded coverage is a reflection of the excellent planning of the symposium; W. M. Kaula, as chairman of the program committee, saw to it that the necessary geographical and technical diversity was reflected in the presentations on the new approaches to the classic problem of geodesy—the determination of the size and shape of the earth. In addition to geodesists and photogrammetrists, the list of authors contains the names of specialists in the fields of mathematics, astronomy, physics, geophysics, electronic engineering, and other fields, thus providing evidence of the numer-