

- p. 95, formula 46, the last equality sign and the middle minus sign should be deleted and a minus sign should be placed before the last x .
- p. 184, line 10, "by formula [12]" should read "by formula [121]".
- p. 207, table 39, "test Y reliability .2" should read "test Y reliability .4".
- p. 210, formula 161c. The exponents of the r 's under the radicals should be deleted.
- p. 215, line 19, 5.0—should read 4.0.
- p. 240, formula 198, kappa minus 1 in the denominator should read kappa minus 2.
- p. 258, formula 213, .6457 should read .6745.
- p. 294, table 61, the constants .2200 and .2399 are incorrect.

The reviewer has received most of these corrections from the author.

H. L. RIETZ

Einführung in die mathematische Behandlung der Naturwissenschaften.

Tenth edition. By W. Nernst and A. Schoenflies. Berlin, R. Oldenbourg, 1922. xii + 502 pp.

Physics and astronomy are no longer the only pure sciences which depend largely on mathematics. At least thirty years ago the necessity of a knowledge of mathematics for work in other natural sciences had come to be recognized by investigators. Research in theoretical chemistry can no longer be carried on nor understood by one ignorant of the ideas of the calculus, and in other fields the need of a mathematical formulation of problems is increasing.

The book by Professors Nernst and Schoenflies is a text and reference manual for the use of scientists in general and chemists in particular. It represents the mathematical equipment beyond trigonometry which, in the opinion of the authors, should be the possession of the modern chemist. The first edition, which appeared in 1895, was a text on elementary calculus with as much analytic geometry as was necessary for the purpose. In the sixth edition in 1910 there was added some explanation of analytic geometry of space, vectors, foundations of analytic mechanics, and partial differential equations. The tenth edition, appearing about a year ago, contains further material on the theory of heat, relativity, and crystal structure.

From the point of view of the teacher of mathematics the book is written with much less care than are most American texts. But it is altogether probable that a meticulous mathematician could not write a book which would make the same appeal to a student of the natural sciences. The wealth of illustrative material which is possible when it is assumed that the reader has studied some physics and a considerable amount of chemistry gives to the mathematical ideas a reality and vitality which they cannot possibly have otherwise. The examples in analytic geometry are built around the laws of Boyle, Mariotte,

Gay-Lussac, and van der Waals. Although the first problem formulated in symbols of the differential calculus is that of finding the tangent to a parabola, it is preceded by an introduction giving examples of discoveries in natural science which were made possible by calculus, and by a general explanation of the type of problems in science which lead to the idea of rates and the methods of the calculus. The inversion of raw sugar is used as an example to show the meaning of integration before any technique has been developed, and there is an abundance of illustrative material for an indefinite integral. The idea of a discontinuous function is presented by recalling the behavior of the volume of a substance which is being heated. The volume varies continuously up to the melting point, then takes a sudden increase, after which it again varies continuously.

The teacher of college mathematics in America is familiar enough with the complaints of his colleagues in the departments of physics, chemistry, and engineering. They assert, probably with ample justification, that the students cannot use the mathematics which they are supposed to have learned. One remedy for this difficulty might be to give the calculus, perhaps for a second time, at a later stage in the college course when the students had acquired enough background of scientific knowledge to appreciate the meaning of the mathematics. It seems impossible that a student able to understand the illustrative examples in Nernst and Schoenflies should fail to grasp the significance of the mathematical ideas or be unable to use the tools put before him.

At the end of the book is a list of problems for drill work and a collection of formulas beginning with elementary algebra and continuing through the calculus.

Only one error has been noted. On page 117, in equation (8), the constant of integration has not been properly determined. The same equation, however, is given correctly on page 125.

W. R. LONGLEY

Kartenkunde. By Dr. M. Groll. Neubearbeitet von Dr. Otto Graf. Vol. II, *Der Karteninhalt*. Berlin, Vereinigung wissenschaftlicher Verleger, 1923. 133 pp.

The second volume of Groll's *Kartenkunde* deals with the classification of maps and their contents. Particular attention is given to the various graphic methods of map construction and topographical representation. Copious historic and literary references and illustrations of various methods in various countries add to the interest and value of the second volume. On the whole it deserves the same praise as volume I, which the writer reviewed in this *BULLETIN* (vol. 29, No. 2 (February 1923), pp. 89-90).

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