

Review

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*Geometry of Complex Numbers.* By Hans Schwerdtfeger. University of Toronto Press, Toronto, 1962. xi+186 pp. \$4.95.

This is the University of Toronto Mathematical Expositions No. 13. The book's three chapters develop three important related areas of the geometry of complex numbers—the analytic geometry of circles, the Möbius transformations, and the two-dimensional non-Euclidean geometries. The material, now mostly standard, is nicely treated, and largely reflects work of C. Carathéodory and E. Cartan. The book caters to the senior-graduate student and lies (using the author's words) "in the intersection of geometry, analysis, and algebra." Each of the fifteen sections of the book is followed by a set of exercises (called "examples" by the author) designed to furnish the reader further information, rather than to test his mastery of the subject, and indications of proof are frequently supplied. The book seems excellent as a collateral text to be used with a course in the theory of analytic functions, but is probably too restricted in its topics to be used as the basic text for a course in the geometry of complex numbers. At any rate, there are large, attractive, and important areas of the subject not covered by the text, and there are similar lacunae in the bibliography at the end of the book. The work is not without some usual first-edition misprints, of which none noted seems to be serious, though this reviewer was a bit grieved to find his name at one place in the bibliography carelessly given as H. Evans, and elsewhere that of his friend Hoggatt as Hoggat.

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*Methods of Celestial Mechanics.* By D. Brouwer and G. M. Clemence. Academic Press Inc., New York, 1961. xii+598 pp. \$15.50.

This book provides a comprehensive background for the practical applications of celestial mechanics. Observational astronomy and theoretical matters are not emphasized. While designed to facilitate numerical work, it does much more. Being developed logically from first principles, it provides motivation for large segments of celestial mechanics. In the exposition few steps are omitted, formulae being displayed in detail. The book is suitable for advanced undergraduate and graduate students, and as a reference work.

The realization of artificial satellites has led to renewed interest in celestial mechanics. Calculating machines have reduced the drudgery of calculations. Much brilliant work has been done in the field of celestial mechanics, especially during the last three centuries. In applications to the motion of bodies in the solar system the accuracies of predictions have been most impressive. It thus is appropriate that the results of the efforts of many be made more fully known in order that maximum benefit be derived therefrom in today's and tomorrow's "space" problems. These considerations have provided the authors, both of whom are greatly skilled in the field, with the motives for writing the book.