torical, biographical, and bibliographical information will convey to the student the enthusiasm of the pioneers in this field of research, put him in contact with the original ideas in their bare form (not overshadowed by symbolism, however powerful), and give him access to the more extensive treatises on this subject.

Another good reason is that the visual content of "geometry" is emphasized, also by a large use of appropriate illustrations. The geometric point of view, so helpful also in researches on more abstract spaces, pervades and illuminates these lectures.

The analytic apparatus (Gibbs vector notation) is appropriate to the subject and its use is always subordinate to the development of the geometric ideas.

A large collection of problems, some for class use and some serving as hints for advanced research, enriches the volume.

The presentation of ideas and of proofs and the typographical presentation are excellent.

E. Bompiani

Grundzüge der Galois'schen Theorie. By N. Tschebotaröw. Trans. and ed. by H. Schwerdtfeger. Groningen, Noordhoff, 1950. 16 +432 pp. f 20.00.

The present (German) edition is a reworked and annotated version of the original (Russian) edition, the date of which is unknown to the reviewer but is certainly prior to 1940; it is based on a series of lectures given at the University of Kasan. The author believes that the modern or abstract recasting of algebra is responsible for increased insight and spectacular advances, but that the abstract approach is not suited to the young student, who should have a thorough foundation of concrete mathematics on which subsequently to lay the abstractions and generalizations. In this book, which is intended to meet the needs of such students, he endeavors to preserve the spirit of classical concrete galois theory and at the same time to introduce such notions as will facilitate the readers' ability to assimilate and appreciate the abstract theory, presumably at some later time.

Chapter I (110 pages) is devoted to group theory, with emphasis on finite groups and, especially, permutation groups, and includes an appendix on A. Loewy's "Mischgruppen" (abstract system of which a realization is the set of all isomorphisms of a field extension of a field K into an algebraic closure of K, with multiplication only sometimes defined), and an appendix containing some remarks on a theorem of Bertrand concerning the symmetric group. Chapter II (76 pages) treats polynomials and fields (with emphasis on number