author's comments on these papers. For example, it is of interest to note that the first entry in the list is a letter from Gauss to Bessel, dated 18 December 1811, in which there is communicated the substance of Cauchy's theorem and certain consequences of it. [According to the second entry in the list, this was some three years before Cauchy announced his result and fourteen years before he published it.] When one realizes that the author's first papers in this field appeared almost simultaneously with various papers of Goursat and Morera on the subject, one appreciates the author's connection with the development of the field at the turn of the century.

A. J. LOHWATER

Altes und Neues über konvexer Körper. By H. Hadwiger. (Elemente der Mathematik von höheren Standpunkte aus. Band III.) Basel, Birkhäuser, 1955. 115 pp. 13.50 Swiss fr.

This small volume, containing less than one hundred pages of actual text, gives an elegant and concise account of convex bodies from the standpoint of the geometry of sets. The general approach is to consider the collection of all convex bodies in ordinary space as themselves forming a metric space $\mathfrak{C}$ with convex polyhedra as a dense subset. $\mathfrak{C}$ also has algebraic structure, namely addition (the Minkowski sum of convex sets) and multiplication by positive scalars (dilation). On this space the volume V, surface area A, and integral mean curvature M are functionals defined in the first instance for convex polyhedra and then extended to $\mathfrak{C}$. Thus it is unnecessary to make any assumption beyond convexity itself on the class of bodies considered. In this context many questions concerning, for example, the differential geometry of convex surfaces become unnatural; but, on the other hand, the study of the functionals V, F, M and their properties, Steiner's symmetrization, and so on, are briefly and elegantly treated. Thus the author easily proves a theorem of Gross and Lusternik to the effect that by repeated symmetrization it is possible to gradually transform any convex body into a sphere; he proves Steiner's formula $V(A_\rho)=V(A)+\rho F(A)+\rho^2 M(A)+4\pi\rho^3/3$ for the volume of a convex body A_ρ parallel to A at distance ρ; and he demonstrates the classical Brunn-Minkowski inequalities: $F^2-3MV \geqq 0$ and $M^2-4\pi F\geqq 0$. In this latter connection an interesting discussion is given of the unsolved problem of determining what further inequalities three real numbers V, F, M must satisfy in order to be the values of $V(A)$, $F(A)$, $M(A)$ for some convex body A. The final twenty pages deal in a general fashion with the integral geometry of convex bodies. The book ends with a detailed thirteen page bibliography. Some original results of the author are included, in particular various contributions to the unsolved problem above and a neat characterization of the class of functionals generated by V, F, and M in terms of functional properties alone. In general, of course, the book is expository, developing in particular Blaschke's idea of introducing a metric into $\mathfrak{C}$. However, the thoroughness with which this idea is exploited is due to the author, who throughout has kept a nice balance between his abstract approach and the concrete results achieved.

WILLIAM M. BOOTHBY

Méthodes d'algèbre abstraite en géometrie algébrique. By P. Samuel. Berlin, Springer, 1955. 9+133 pp. 23.60 DM.

The goal of the present work is, according to the author, "to give as complete an exposition of the foundations of abstract algebraic geometry as is possible," and to be useful to the practitioner ("l'usager" as Samuel calls him). Actually the main use of this book will be found as a handbook for one who wishes a less abrupt and difficult introduction to the abstract methods of algebraic geometry than is afforded by Weil's *Foundations* (which, it is too often forgotten, was not meant as an introduction). This latter book begins with three arduous chapters on pure algebra, whose use does not become apparent until much further in the book. Such a barrier does not exist in Samuel's exposition, because he assumes known all the needed basic algebra, or rather refers as he goes along to an appendix containing purely algebraic basic results, or references to those in the literature. (This of course could not have been done by Weil, for the good reason that most of these results were not in the literature at the time.) Samuel proceeds immediately with the geometric language and hence the reader's first contact with abstract methods is reasonably soft.

The book is divided into two parts. The first one gives the general theory of algebraic varieties, defined as either affine or projective varieties. It begins with the notion of algebraic set (set of zeros of polynomial ideals), union and intersection of these, and continues with the notion of dimension, generic points, products, projections, correspondences, rational and birational maps. The deepest theorem in this part asserts that every component in the intersection of two varieties V and W of dimension r and s in projective n space has dimension $\geqq r+s-n$. Elimination Theory is discussed as a special case of the theory of projections (as it should be) and is derived elegantly from the basic and elementary theorem on the extension of specializations. So is the Hilbert Nullstellensatz.

There is a section on properties which hold almost everywhere (i.e. at least on the complement of some proper algebraic subset of a given variety), followed by a section on Chow coordinates. The no-