the concepts of rational and birational correspondences. Lüroth's theorem and the remaining Plücker formulas are then derived. Finally valuations are defined and their connection with places is established. The last chapter is given over to linear series, applying them first to obtain a nonsingular birational transform of an irreducible curve. Study of the canonical series then leads to the genus of a curve and to the Riemann-Roch theorem. Two further topics bring the book to a close: partial classification of curves under birational equivalence leading to appropriate canonical forms, and treatment of the nonsingular cubic including Salmon's theorem on the cross-ratio.

A great deal of the book is given over to purely algebraic topics, making possible an exposition of the theory of curves which is completely rigorous. Indeed many of the curve-theoretic proofs are valid for the more general situations to which the reader might progress in his further study. On the other hand the exposition of the algebra makes no such provision for the reader's education. It is so extremely concise and so thoroughly tailored to the special purposes of the book that this reviewer believes its study to be a most uneconomical use of the reader's time.

The quantity of out and out algebraic geometry is relatively small, by comparison with older treatises, but its quality is very high. A question might be raised on the propriety of having the resolution of singularities take place before the student has studied parametrizations, for without them the proof is unnecessarily hard and the achievement of only ordinary singularities is not easily appreciated. With a few such exceptions the individual topics which are treated are treated well. Nevertheless, the total impact of the book is disappointing. The book might be very illuminating as a companion volume to one of the older works, but the beginner in the subject is not likely to benefit from it. He is given no awareness of the rich body of knowledge to which it relates, and, although he is told from time to time that a certain item is important, he sees no systematic working out of a basic problem which could independently justify his activity.

HOWARD LEVI

Weltsystem, Weltäther und die Relativitätstheorie. By Karl Jellinek. Basel, Wepf, 1949. 15+450 pp. 45 Swiss fr.

The subtitle of this book on special and general relativity and on relativistic cosmology reads: *An introduction for the experimental natural scientist.*

The author's approach to the subject is often laborious, and there seems to be some danger that a reader might get lost in the details of specific transformation equations and long-winded discussions of apparent paradoxes. Here are a few examples of the method of presentation: Minkowski's space-time geometry is introduced in the sixth and last section of the long chapter on special relativity, whereas the proof of the Lorentz invariance of Maxwell's equations is given in section 5. The chapter on tensors does not include any discussion of covariant differentiation or the proof of the tensor character of the curvature tensor. In the chapter on general relativity, the Schwarzschild line element is given without derivation. On the other hand, a detailed calculation is made to show that certain radial lines are geodesics; here a simple symmetry argument would have sufficed.

The author attaches some importance to the possibility of retaining a "world ether" consisting of "tiny ether atoms." This point of view is perhaps old fashioned at a time when most physicists would dispute the usefulness of introducing a mechanistic model for its own sake.

For purposes of reference the value of the book is impaired by the very large number of abbreviations. An index of these would have been useful.

A. SCHILD

The theory of algebraic numbers. By Harry Pollard. (Carus Mathematical Monographs, no. 9.) Buffalo, The Mathematical Association of America; New York, Wiley, 1950. 12+143 pp. $3.00.

For many years no suitable treatment of algebraic number theory has been available in English. The present monograph, presenting a concise and careful exposition of the elements of the classical theory, is thus most welcome.

The introductory material covers the unique factorization of the rational integers and of the Gaussian integers $m+ni$, together with the (little) Fermat theorem in both cases. The familiar example of nonunique factorization for the integers $m+n(-5)^{1/2}$ is then presented. Then algebraic numbers are defined in general, and the (constructive) existence of transcendental numbers is demonstrated. The elementary properties of algebraic number fields and of algebraic integers are then developed. For the fundamental theorem of ideal theory (every ideal can be represented uniquely as a product of prime ideals) both the classical proof and the Ore modification of the Noether-Krull axiomatic proof are presented. Among the consequences is the proof that a rational prime is unramified in a field if it does not divide the discriminant of the field.

The definition of an ideal is motivated by a tentative description