

with this sort of mathematics. With the rigorist the question at issue is frequently not whether the proposition which apparently is being considered is *true* or not, but whether it follows from some other proposition. That is, how much must we say to include by implication a certain other body of propositions.

It seems equally legitimate to inquire what must be the properties of systems of numbers in order that they shall express conveniently and accurately the varied phenomena that daily impinge upon us.

The prospective reader must judge for himself whether this is the sort of book he wants to read. Does he wish to study the modern development of the various algebras as based upon definite assumptions? Then this book is of no use to him. Does he wish to see an attempt to develop these algebras as corollaries of physics? Then it is probably the best book he could find.

N. J. LENNES.

*Grundlagen der Geometrie.* Von Dr. FRIEDRICH SCHUR. Leipzig, Teubner, 1909. vii + 192 pp.

THE *Neuere Geometrie* of Pasch marked the first effort to set up a complete set of fundamental statements for geometry—if we except the manifoldness development of Riemann. Following the appearance of that book there came a remarkable development of the subject that has thrown great light upon the logic of geometry. Schur wishes the present book to be considered as, in a sense, a revision of Pasch. Although the author expresses very strongly his indebtedness to Pasch, in only the most general way can the book be said to be such a revision.

In the general trend of his development the author follows Peano, in that congruence is obtained from motion or from projective geometry rather than directly from postulates, as is done by Hilbert, for example.

The general problem is formulated as follows: "To set up a simple and complete system of intuitive facts or axioms, entirely independent of one another, from which geometry can be derived by purely logical processes. To deserve the name geometry, axioms must be employed which express the results of the simplest and most elementary consideration of geometric figures, from which they are obtained by abstraction." This of course bars out the idea of space as a number manifold.