BOOK REVIEWS

Diophantische Gleichungen. By T. Skolem. Ergebnisse der Mathematik und ihrer Grenzgebiete, Band 5, Heft 4. Berlin, Springer, 1938. 130 pp. R.M. 15.

Included in the author's preface is this statement, "Hier dagegen ist es versucht worden, eine zusammenfassende Darstellung der Theorie der diophantischen Gleichungen zu geben von den einfachsten bis zu den schwierigsten, die man bis jetzt hat bewaltigen können, aber nur soweit sie allgemeinen Methoden zugänglich sind. Es gibt bekanntlich auf diesem Gebiete sehr viele Untersuchungen über ganz spezielle Gleichungen; auf solche wird nicht eingegangen."

All the equations considered by Skolem, with the exception of several types considered in Chapter II, are of the form

$$f(x_1, x_2, \cdots, x_n) = 0,$$

the left-hand member of the equation being a polynomial in the unknowns $x_1, x_2, \cdots, x_n$ with given integral coefficients, the problem being to find all rational solutions or, in particular, integral solutions. Obviously, not all equations of this type which have been treated in the literature could have been considered in a pamphlet of this size. Hence he has elected, as he states above, to take up mainly what he regards as the most general types of equations concerning which definite results have been found. For example, congruences are special kinds of diophantine equations, but Skolem has wisely omitted any discussion of them, except for certain systems considered on two pages in the first chapter.

Many theorems are stated and proofs of some are given. When the proofs are not given references are usually indicated which enable us to find the demonstrations in the literature.

Diophantine analysis is noteworthy for the great interest which mathematicians have exhibited in certain methods which so far have been applied only to comparatively special equations. A number of these are not mentioned by Skolem, and we think it will be illuminating to refer to them in the course of this review.

In the first chapter of the book, the author considers linear equations of the form

$$\sum_{s=1}^{n} a_{rs}x_s = b_r,$$

$r=1, 2, \cdots, m$, and gives a number of the results of Heger, Smith