Théorie des Nombres. By M. Kraïtchik. Paris, Gauthier-Villars et Cie. 1922. ix + 229 pp.

This book is underwritten by a brief preface by M. d'Ocagne in which a few historical statements are made to give the book its setting. There are six chapters followed by sixty pages of tables. The entire book is built around primes and probably might properly be called theory of rational primes. Possibly algebraic numbers in general, quadratic and other realms, ideals, and other topics which might be expected in a *Théorie des Nombres* are to be taken up in a later volume to which allusion is made (pp. ix, 97, 107, etc.).

Chapter I is a general introduction presenting the classical theory of the rational prime including the *indicateur.* In Chapter II on the linear congruence the author takes up the solving of a system of such congruences in one unknown by a method which is a sort of extension of Eratosthenes, sieve. He then (pp. 43, 44) explains how a calculating machine could be made which would solve such problems mechanically. This and graphical methods employed or suggested by the author (pp. 95, 159 where "troisième Chapitre" probably should be "deuxième Chapitre") indicate his ingenuity.

About a third of the theory in the book is taken up by Chapter IV on congruences of the second degree. This chapter is well done. The law of reciprocity for quadratic residues, Gauss' "gem of the higher arithmetic", is neatly put forth. Possibly for a book of this size some of the applications are a little extreme; as here, Lucas' problem of finding the integers having the same final ten digits as their squares (p. 90).

The Fermat-Euler and Wilson theorems are taken up in the theory contained in Chapter III on congruences of higher degrees. Indices are taken up in Chapter V, and application of a table of indices is made to the solving of binomial congruences of first and second degrees.

Chapter VI is on factorization and discusses methods employing the forms $x^2 \pm Dy^2$. The use of moduli in factoring is also introduced.

Six lists of tables are given of which the longer are: II, Linear Divisors of $x^2 \pm Dy^2$ for $D < 200$, IV, A Table of Residues, V, A Table of Indices, VI, Decomposition of $2^n \pm 1$. In the book mention is made to unpublished tables by the author (pp. 119, 126, etc.).

The reviewer has made no attempt to check the tables given; he has found very few typographical errors in the book. M. Kraïtchik is fortunate in being both brief and lucid in his exposition. The following observations may, however, suggest limitations to the use of this *Théorie des Nombres* as a textbook: 1. There are numerous examples throughout the book but no exercises. 2. An appropriate number of mathematicians of this field are mentioned (cf. pp. 9, 22 and the index), but very few references are given.

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