By varying the values of q, r, s, u, an infinite number of sets of three square integers can be found that can also be expressed as the sum of two squares ; but the first given above is probably the *smallest* set in which the numbers are all different.

Since writing the foregoing note I have been informed by Mr. Ball that the above error probably arose from a confused memorandum of Diophantus's impossible forms for the sums of two and three squares.

WASHINGTON, D. C., *September* 15, 1892.

THE THEORY OF EQUATIONS.

An Elementary Course in the Theory of Equations. By
C. H. CHAPMAN, Ph.D., Associate in Mathematics in Johns Hopkins University. New York, John Wiley & Sons, 1892. 12mo, pp. viii + 90.

IN the past no American text-book has treated exclusively of the theory of equations, but the subject has been presented briefly in the closing chapters of the more complete works on algebra. The marked tendency at the present time to prefer a sort of parallel study of several correlated branches of mathematics to carrying on successively each subject as far as possible before taking up another, has led to the introduction in many cases of short courses in trigonometry, analytical geometry, and calculus between the more elementary algebra and the theory of equations. Under this system it becomes at once desirable to treat the latter subject in a separate text-book, into which it is proper to introduce the notation and principles of the infinitesimal calculus, although logically they may be altogether unnecessary.

The first impression conveyed by the little book which comes from the pen of Dr. Chapman is that it has been unduly condensed, but upon a more careful examination one perceives that to a student possessing a very slight knowledge of analytical geometry and calculus the treatment of the subject is unusually intelligible. The book is worthy of praise both on scientific and on pedagogical grounds. The definitions are accurate, the demonstrations rigorous, and the choice of material excellent ; while the questions addressed to the student at various points, the problems, and suggested demonstrations are sure to be effective.

The first part relates to determinants. It occupies but twenty one pages, and leads from first principles through the most elementary propositions to the solution of linear equa-

tions, and elimination by Sylvester's dialytic method. In this connection we could wish that the author should have suggested to the student the application of elimination to the rationalization of algebraic equations, thus showing that the equation treated in the second part actually represents the most general algebraic equation possible. The second part contains forty pages. After explaining the graphical representation of imaginaries, it gives the demonstration that every equation has a root by the method of Gauss. Then follow symmetric functions, the proof that they can be expressed by means of the coefficients, and their application to the formation of resultants and discriminants. Here Sylvester's method reappears for the purpose of shedding a side-light on the last mentioned subject. Twenty four pages suffice for the third part. They contain Descartes' rule of signs, Rolle's theorem, the method of freeing an equation from equal roots, Sturm's theorem, and Horner's method. One section gives a rule for finding the superior limit of the real roots, but, strange to say, neglects to mention the obvious modification for finding their inferior limit.

It will be seen that the contents of the work are amply sufficient for the undergraduate curriculum of any college or scientific school, although they are made to occupy only ninety pages. At the end of the book is found a note on rectangular arrays, but it is not easy to see how this note, appearing alone, can have any significance to the students in whose hands the book may be placed.

<div align="right">THOMAS S. FISKE.</div>

NOTES.

THE officers of Section A at the Rochester Meeting of the American Association for the Advancement of Science were: Vice-President, J. R. Eastman of Washington; Secretary, Winslow Upton of Providence. The following papers were read: The neglected field of fundamental astronomy, by J. R. Eastman; On the conflict of observation with theory as to the earth's rotation, by S. C. Chandler; Meteorological observations made in April, 1890, 1891, 1892 in the totality path of the eclipse of April 16, 1893, by David P. Todd; Latitude of the Sayre Observatory, by C. L. Doolittle; The secular motion of a free magnetic needle, by L. A. Bauer; On the discriminators of the discriminant of an algebraic equation, by Mansfield Merriman; The spectroheliograph of the Kenwood Astro-Physical Observatory, Chicago, and results obtained in the study of the sun, by G. E. Hale; Least square fallacies, by T.