It is fair to say, that Schubert is entirely willing to take the responsibility for this interpretation, for we read four pages later in his work:

"We discover that, if we apply the ordinary rules of arithmetic to $a \div 0$, all such forms may be equated to one another, both when a is positive and when a is negative. We may, then, invent two new signs for such quotients $+\infty$ and $-\infty$."

We are not sure whether Schubert looks upon the use of this recumbent figure eight as a mathematical recreation. It certainly has no practical utility, it has no connection with the conception of a variable becoming infinite which is so fundamental in the calculus, and it does not come under any law of no exception since the old laws of reckoning do not all apply to it. But Schubert's book is not before us for review, and we prefer to assume that our present author copied this phrase inadvertently. Another inadvertence occurs on page 347:

"To invest $\sqrt{-1}$ and $\sqrt{-4}$ with a meaning, imaginary numbers must be introduced. . . . Imaginary numbers are just as real as other numbers." We do not wish to dispute this if the author will tell us what he means by an imaginary number; is it a real number-pair, a point in the Gauss plane, or merely a graphical symbol? There is no answer given to these questions; the most certain thing which we learn about an imaginary number is that it is real.

We seem to be closing this review with unfriendly comment; that is not the final impression which we wish to give. The faults of the book appear to us in the nature of "removable singularities," its merits are lasting.

J. L. COOLIDGE.

Anharmonic Coördinates. By Lieut.-Colonel HENRY W. L. HIME. Longmans, Green and Company. xiii+127 pp.

THE author's purpose in writing this book was to give a more detailed explanation of anharmonic coordinates than was given by their inventor, Sir W. R. Hamilton. Without laying any claim to originality, he has amplified Hamilton's outline to a degree that makes it quite ready reading as far as method is concerned, though there is a very noticeable amount of algebraic detail that is necessarily abbreviated. The first chapter is devoted to showing how a definite vector may be associated with any given point in the plane by means of the Möbius net. The three numbers appearing in the expression for this vector and by which the point is fixed are called the anharmonic coordinates of the point. In chapter III, the equation of the straight line is developed from a condition on the coefficients of three coinitial vectors. Among the subjects treated in the other chapters are the general equation of the second degree, special conics, tangential equations, the anharmonic ratio, the involution, circles, and foci.

In regard to some details in the book, the reviewer would suggest omitting the words "of intersection" from line 7, section 8°, on page 14. Also it would seem better to use the parameters t and v homogeneously throughout section 9°, pages 14 and 15. In equation (16), page 17, read cos $C(p_1q_2 + p_2q_1)$ instead of cos $C(p_1q_1 + p_2q_1)$. The next form of this same equation displays without warning a change of notation that at first glance is rather puzzling. Half a line would state the change clearly. In line 5, page 20, read P_1' and P_2' for P_1 and P_2. In the line following equation (1), page 21, read $\Sigma^2 lx_2$ for Σlx_2. In the equation near the bottom of page 27, read $2(f\varphi_{x'} + g\varphi_{y'} + h\varphi_{z'})t$ for $2(f\varphi_{x'} + g\varphi_{y'} + h\varphi_{z'})$. In line 9, page 51, read X for IX. In line 10, page 54, read "the" for "some." At the bottom of page 63, read $p|pq_2r_3|$ and $p|pq_4r_3|$ for $r|pq_3r_2|$ and $r|pq_3r_4|$, the values of t and t' respectively. In line 2, section 5°, page 65, read D' for D. The value given for $C'D'$, page 67, is the reciprocal of the correct value. Likewise for the value of $B'C'$, and in addition read $|x_2y_3|$ for $|x_2y_2|$. The ditto marks on page 87 neglect the factor $a^2b^2c^2$. In the value for y'/z', page 88, read $|xy_1z_2|$ for $|xy_2z_2|$. In line 3 from the bottom of page 93, read c^2 for c^3.

These items suggest that the book is a little loosely put together in some respects; but it contains nevertheless much valuable material.

J. V. McKelvey.

Algebraische Kurven. Zweiter Teil: Theorie und Kurven dritter und vierter Ordnung. By Eugen Beutel. Sammlung Göschen No. 436. Leipzig, 1911. 16mo. 135 pp. Price, 80 Pf.

In a thin book of pocket size this treatise gives a large number of most precise definitions and theorems, fifty-seven well-executed cuts, and a variety of carefully worked out nu-