same relation to an ordinary differential that geodesic parallelism bears to ordinary parallelism and from this the operator ∇ is defined similar to the usual definition. The absolute derivative is then derived as ∇V where V is a vector or system of the first order. The various products of ∇ with the various affinors give the formulas needed in hyperspace. Chapter three deals with the curvature properties of a curved space of m dimensions contained in a curved space of n dimensions which do not depend on the Riemann-Christoffel tensor. The whole development is similar to the ordinary treatment of an m-spread in a euclidean space of n dimensions. There is a remarkable similarity in the formulas in the two cases.

The fourth chapter treats those curvature properties which depend on the Riemann-Christoffel tensor.

The text is preceded by an introduction of twelve pages which it is worth anyone's while to read. The last twenty pages are devoted to a bibliography which contains nearly four hundred titles. This gives one a good notion as to the historic development of the subject. The author has been very careful to give credit to the proper author for all ideas and formulas. The reference one meets most frequently is to Schouten, for the notation used is largely due to him.

The book is not easy reading, but as one becomes more familiar with the notation, he will find that the difficulty decreases, and he will feel amply repaid for his trouble.

C. L. E. MOORE

A First Course in Nomography. By S. Brodetsky. London, G. Bell and Sons, Ltd., 1920. 135 pp.

Brodetsky has supplied us with the sort of book the subject has needed: a brief, readable exposition of elementary character. It will well serve two purposes. It is an excellent introduction to D'Ocagne, and it also enables its reader to gain a practical working knowledge of the nature and uses of nomograms with a minimum expenditure of time.

The author states in his preface that "it is the object of this First Course to offer a clear and elementary account of the construction and use of such (nomographic) charts" and that "it is a treatment that should be found useful by the reader who desires to become acquainted both with the theory of nomography and with its practical use."

On the whole the author has carried out his intentions fairly well, but, as a text for college students, the book is open to criticism. While a considerable amount of knowledge of algebra, trigonometry, and analytic geometry is presupposed, the author's treatment is very uneven in its demands upon the reader's knowledge and intelligence.

While simple matters of mechanical detail are carefully explained, the theoretical discussions contain many serious gaps and fail to make skilful use of the knowledge the reader is supposed to possess.

Moreover, the reader's confidence in the author is severely shaken by a piece of grossly illogical reasoning on pages 37 and 38. The author asks: "Is it possible to subtract in such a way that the result is given on a scale graduated with the same unit as the one begun with?" His answer is: "No! If we examine Fig. 4 and Fig. 14 (the only two nomograms which give the result of subtraction, the former by $b = x - a$, the latter by $x = a - b$) we see that in each case the final unit is different from the first unit." Not only is the logic faulty, but the conclusion itself is incorrect. Fig. 19 on page 35, although designed to be used for the addition $x = a + b$, obviously is equally useful for the subtraction $a = x - b$, and the unit for a is the same as the unit for x. Hence the book, although very useful for some purposes, cannot be regarded as wholly satisfactory.

R. D. BEETLE

Un Théorème de Géométrie et ses Applications. By Georges Cuny. Paris, Vuibert, 1923. 6 + 102 pp.

Let us denote the cross ratio of the four lines OX, OY, OM, ON by R_M. Let OX and OY meet an algebraic curve C_n in $A_1, \ldots, A_n$, and $B_1, \ldots, B_n$, respectively. Let C_n meet an algebraic curve C_p in $\alpha_1, \ldots, \alpha_{np}$. Let C_p meet $A_i B_i$ in $\beta_1, \ldots, \beta_{np}$. The theorem is that the product of the R_α's is equal to the product of the R_β's. As a special case, if C_n has a multiple point of order $(n-1)$ at 0, this product is a function of p alone.

No one can fail to be impressed by the bewildering array of well known theorems which appear as special cases of this remarkably general theorem. As examples we note two general theorems on algebraic curves due to Newton, Pascal's hexagon theorem, Pappus' theorem, Carnot's theorem, Poncelet's theorem on the intersections of a cubic and conic, Frégier's theorem, Cazamian's theorem; examples selected from among scores of familiar projective and metric theorems. The methods of polar reciprocation, of inversion, and Laguerre's projective definition of angle are most happily employed. Extensions to three dimensions are briefly indicated.

The book should be of great value, especially to the younger graduate student. The reviewer believes that the possibilities of the theorem are by no means exhausted. Further investigations might well be incorporated in masters' theses. The subject matter is admirably adapted for student lectures in a course on modern geometry.

B. H. BROWN