SHORTER NOTICES

Les Espaces Mêtriques Fondês sur la Notion d'Aire. By E. Cartan. Hermann, Paris, 1933. 46 pp.

The first part of this booklet is a resumé of the author's work on Finsler spaces in which the fundamental element is a point and a reference vector at the point. From this point of view, corresponding to a three-dimensional Riemann space we should have a five-dimensional Finsler space. The element considered in this book is a point and an $(n-1)$-dimensional area. It arises quite naturally from the metric properties of a surface integral and is obtained by imposing a few simple conditions on the quantities used. It is thus shown that if $g^{ij}(x, u)$ are the components of the fundamental tensor, u_i being a covariant vector, then

$$g^{ij} = \frac{1}{\Delta^{1/(n-1)}} \cdot \frac{1}{2} \cdot \frac{\partial^2 L^2}{\partial u_i \partial u_j},$$

where Δ is the Hessian of the form $L^2/2$.

From there on the development of such topics as the angular metric, parallelism, curvature, are quite analogous to the corresponding ideas for Finsler spaces. In fact it seems that the whole problem could be solved by considering the Finsler metric, not as a function of a point and a contravariant vector, but of a point and a covariant vector.

M. S. KNEBELMAN

Dynamics of Rigid Bodies. By W. D. MacMillan. New York and London, McGraw-Hill, 1936. xiii+478 pp.

This is the final volume of the author's series on theoretical mechanics, but is to a great extent independent of the first two. These dealt with the statics and dynamics of a particle, and with the theory of the potential.

The vector notation of Gibbs is introduced in the first chapter, and is used freely thereafter. In the first two-thirds of the book, the principles of energy, momentum, and moment of momentum are used to set up the equations of motion for systems of particles and various special types of motion of rigid bodies. In two later chapters the equations of Lagrange, and of Hamilton are discussed. The last chapter is devoted to methods, developed by the author, for finding periodic solutions of certain systems of differential equations as power series of a parameter.

There are numerous references to original memoirs in the text, and a short list of treatises on mechanics at the end. Lists of problems are given after each chapter. The book is attractively printed, with numerous excellent figures, and is a welcome addition to the existing texts on theoretical mechanics.

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