hyperbolic infinitesimal transformations. Every non-elliptic transformation in G_{mn} can be generated from an infinite number of distinct infinitesimal transformations; for every such transformation belongs to an infinite number of distinct subgroups.

THEOREM 8. *Every finite transformation of the group G_{mn} can be generated by the repetition of an infinitesimal transformation of the group. Every elliptic (non-elliptic) transformation in G_{mn} can be generated from two (an infinite number of) distinct transformations. Hyperbolic transformations for which k is negative can not be generated by either hyperbolic infinitesimal transformation.*

UNIVERSITY OF KANSAS,
February, 1903.

STUDY'S GEOMETRY OF DYNAMES.*

Geometrie der Dynamen. Die Zusammensetzung von Kräften und verwandte Gegenstände der Geometrie. Von E. STUDY. Leipzig, Teubner, 1903. 8mo., 603 pp., 46 figs.

THE original purpose of Professor Study's book was to present a systematic geometric treatment of the composition of forces acting on a rigid body, but as the work progressed the idea broadened, resulting in an elaborate treatise on a whole field of geometry, hitherto nearly unknown.

Probably no other work on geometry that has appeared since the memoirs by Klein and by Lie in the early volumes of the *Mathematische Annalen* contains so many original and fruitful ideas as that under review.

The book is divided into three parts: the first (pages 1–122) treats of the composition of forces as a problem in pure geometry; the second (pages 123–225) treats the same problem analytically, making free use of symbolic notation and of line geometry; the third (pages 226–556) is devoted mainly to the discussion of a transformation first met with in the second part.

The first two parts contain a new geometric theory of the composition of forces and of infinitesimal motions. In the first part no use is made of other branches of mathematics than elementary geometry and trigonometry, but in order to express

* Dyname is the form used by Plücker in his English papers in the London Transactions Roy. Soc.