last theorem of Chapter III is incorrect but is easy to remedy. In theorem 23.1 of Chapter IV, the inequality should read "$q \leqq p$." The proof here is not quite complete.

The terminology and notations used here are those of *Algebraic Topology*, so the index and bibliography are brief. There is, however, an additional bibliography of papers dealing with the subjects of retraction and homotopy local connectedness which is quite complete and useful.

<div align="right">EDWARD G. BEGLE</div>

The calculus of extension. By Henry George Forder. (Including examples by Robert William Genese.) Cambridge University Press; New York, Macmillan, 1941. 15+490 pp. $6.75.

It will soon be the hundredth anniversary of the initial publication of Grassmann's monumental work *Die Lineale Ausdehnungslehre Ein Neuer Zweig der Mathematik*. Perhaps this fact will serve to arouse some belated interest in Grassmann's celebrated but otherwise neglected contributions to mathematics. If so, the excellent volume under review should indeed be a welcome addition to the comparatively meagre supply of general works treating this subject.

The history of the *Ausdehnungslehre* is extremely depressing. Grassmann had hoped that he would be able to secure the special opportunities for mathematical research that naturally accrue to a university post. In this he was bitterly disappointed. Such a position was not forthcoming. Cajori writes[1] "At the age of fifty-three this wonderful man, with heavy heart, gave up mathematics, and directed his energies to the study of Sanskrit, achieving in philology results which were better appreciated, and which vie in splendor with those in mathematics." Grassmann presented the *Ausdehnungslehre* in two books. The first, *Die Lineale Ausdehnungslehre*, appeared in 1844 (second edition, 1878) and the second, *Die Ausdehnungslehre, vollständig und in strenger Form bearbeitet*, in 1862. It has been said that only one person had read through the *Ausdehnungslehre* of 1844 eight years after its publication. Apparently, it was too new, general, and abstract to meet with popular approval. The *Ausdehnungslehre* of 1862 is easier to read and gives ample evidence of the wide range of the applications. It fared but little better than the former. In recent times Grassmann's work has been better appreciated. The historians of our subject[2] com-

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[1] See Florian Cajori, *A history of mathematics*, New York, 1938.

[2] See, E. T. Bell, *The development of mathematics*, New York, 1940; Florian Cajori, *A history of mathematics*, New York, 1938; J. L. Coolidge, *A history of geometrical methods*, Oxford, 1940.