

the funicular polygon. Few detailed solutions are given, the emphasis being rather on the first principles and the essential similarity of the various methods in use. The space figure over the plane figures is utilized to assist the development.

Engineers who want detailed methods will find little here to interest them. Those who desire a knowledge of fundamentals which will enable them to devise their own methods will find this text very suggestive. Mathematicians will find here concrete examples of some geometrical transformations, but little that would serve to advance the theory of such transformations. Where the "finest flowers bloom along the way of application" the author scarcely shows.

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Vorlesungen über technische Mechanik. Von AUGUST FÖPPL.
Band 6 : *Die wichtigsten Lehren der höheren Dynamik.*
Leipzig, Teubner, 1910. xii + 490 pp.

VARIOUS volumes in various editions of Föppl's lectures on mechanics have been reviewed in this BULLETIN,* always with unstinted though measured praise. That the public shares our enthusiasm for the work is fully indicated by the rapidity with which new editions follow one another. The work as now constituted, in what may perhaps be believed its final form, has six volumes instead of the original four. The titles are Einführung in die Mechanik, Graphische Statik, Festigkeitslehre, Dynamik, Die wichtigsten Lehren der höheren Elastizitätstheorie, and Die wichtigsten Lehren der höheren Dynamik. It is this last which is now under review. But before we begin let us repeat from an earlier review the wish that our students of technology had the advantage of such a work as this in English. There are not nearly enough exercises and examples to suit our needs, but the text we believe is far superior to anything we have.

The first section of the work deals with relative motion. Now-a-days we hear a great deal about the principle of relativity, according to which all actual motions in our physical universe are representable by differential equations which are invariant under the transformations of the Lorentz group, that is, the orthogonal group which leaves the form $x^2 + y^2 + z^2 - c^2t^2$ invariant. This has served to emphasize the fact that the old-fashioned Newtonian mechanics has also its principle of rela-

* See vol. 9, p. 25, and vol. 13, p. 520.