

may mention the calculus of variations, oscillations of lakes and membranes, and hereditary problems in dynamics, elasticity, and electromagnetism.

As the treatment is very concise, and detailed proofs are rare, the book is difficult to read; but full bibliographies appended to the various chapters, frequent references in the text, and an excellent translation will no doubt prove of great assistance to the reader. No one interested in the topics dealt with can afford to ignore this work by one of the most prominent Italian mathematicians.

*Vectorial Mechanics.* By Prof. Louis Brand. Pp. xvii + 544. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1930.) 25s. net.

THE book before us is intended as "an introductory text-book on mechanics for students of engineering and physics". It fulfils the first of these functions perfectly, in so far as it includes a great number of problems and worked examples chosen from topics of special interest to engineers. Physicists, however, are not so well catered for, and unfortunately some of the fundamental principles are not given in a form sufficiently general for the purposes of modern physics. Thus, Newton's Second Law is stated only for invariable masses, and the Third Law only for central forces, no provision being made for extensions to relativity problems and to electromagnetic systems.

These are but slight blemishes on an otherwise excellent book which should prove of great use to engineering students. Vector methods are used freely and are sufficiently explained in two chapters on vector algebra and vector calculus. A chapter is devoted to three-dimensional statics, and it includes an elegant method of reducing the general system of forces, first to two forces and then to a force and couple. There is a long chapter on the kinematics of plane motion with applications to linkages and various gears, and another on the dynamics of rigid bodies with applications to the balancing of masses, to governors of various types, and to the gyroscope as used in engineering. Although intended primarily for students in American universities, it will no doubt be of interest also to English students and teachers.

*Topology.* By Prof. Solomon Lefschetz. (American Mathematical Society Colloquium Publications, Vol. 12.) Pp. ix + 410. (New York: American Mathematical Society; Berlin: Hirschwaldsche Buchhandlung; Cambridge: Bowes and Bowes, 1930.) 4.50 dollars.

THE monograph under review illustrates in a striking way the great progress made in mathematics in recent years even in so specialised a branch as *Analysis Situs*, for the bibliography includes nearly three hundred references, almost all to papers published during the last decade. The work is not a text-book, but, as it were, a digest of research work done in the subject since the publication of Veblen's "Analysis Situs" in 1922. Consequently, it makes great demands on the reader's knowledge, and is not suitable as an

introduction to the subject; but it is of great importance to the expert in topology, and will prove to be a mine of information for all engaged in research in this field.

The topics treated are the elementary combinatorial theory of complexes, the topological invariance of the homology characters, manifolds and their duality theorems, chains on a manifold, product complexes, transformation of manifolds and infinite complexes, with applications to analysis and algebraic geometry. The book is well arranged and clearly written, as may be expected from one who, like the author, has distinguished himself by research in the subject, and appears likely to exert a beneficial influence on future research.

#### Miscellany.

*George Eastman.* By Carl W. Ackerman. Pp. xviii + 522 + 25 plates. (London: Constable and Co., Ltd., 1930.) 24s. net.

GEORGE EASTMAN is a man of great faith, enormous energy, and indomitable perseverance. He left school at fourteen years of age (1868) and worked in an assurance agency, and a year later he became practically interested in photography. In 1877, after he had been working hard making emulsions and a coating machine, often all night, for he was still engaged as a clerk during the day, he determined to make plates commercially, and in 1879 he patented his coating machine, and in 1880 he was in business for himself. In 1884 he got the notion of a transparent film, and was obsessed with its advantages; and in the same year, in conjunction with Mr. Walker, he patented the roll holder. These were the beginnings of the Eastman Kodak Company.

The company has not always sailed in smooth waters—far from it; but when his partners were pessimistic, when some of his employees conspired against him, when the Government took action against him because of the vastness of his business, and when in early times the company was in debt, Mr. Eastman was always optimistic. He wrote: "The manifest destiny of the Eastman Kodak Company is to be the largest manufacturer of photographic materials in the world, or else to go to pot", and he took good care to realise the former alternative. He also wrote: "I am a believer in one man management and that a Board of Directors is valuable only as an advisory instrument to a good manager". He believed in full-page advertisements and many of them. In the year 1896 he made his one hundred thousandth kodak, and at the factories at Rochester (N.Y.) and Harrow was making about one hundred miles a week of film and photographic paper. Mr. Eastman has been a great and generally anonymous helper of the needy all his life, increasing his gifts as he was able until they reached millions of dollars.

The author has used the enormous mass of documents at his disposal with much skill in writing the fourteen chapters, or essays, of which the book consists, and has appended a very full and useful index.