

Fundamental Sources of Efficiency. By FLETCHER DURELL. Philadelphia and London, J. B. Lippincott Company, 1914. 368 pp.

IN these latter days of accelerated national development, an era in which whole philosophies of life are being subjected to their supreme test—the right to live—the old principle of the survival of the fittest has assumed a new aspect and we now recognize it in the problem of national efficiency.

We have all read of the wonderful results obtained by men of genius through the intelligent application of a few simple principles of efficiency in concrete fields. The magazines have been flooded with stories using these as themes. Technical journals have presented arrays of facts and figures illustrating the astounding results obtained through their use; efficiency engineering is a modern and live profession; economists are dividing themselves into schools in accordance with their beliefs concerning the workings of these principles and some philosophers tell us that the social order is rapidly changing—that intelligent cooperation is superseding individualism.

We have seen manufacturing plants reorganized; yes, even self-appointed committees of politicians from state legislatures have set themselves the—to them—simple task of reorganizing great universities.

But we have not—at least not all of us—read a book such as that under review, in which are summarized and analyzed into a few elemental principles the various forms and sources of efficiency. It is so written that the general reader may enjoy its pages and a mathematician may easily find in the groups of exercises at the close of the chapters many a mental stimulus. An efficiency expert would find the summaries near the ends of the chapters logical recapitulations of discussions carried out—bird's-eye views of the fields covered therein.

The following are the headings of a few of the 18 chapters and appendices *A* and *B* contained in the book: II. Reuse, III. The unit and its multiplier, IV. The group, . . . , IX. Expenditure and results, . . . , XIII. Rhythm. These titles are sufficient to suggest, perhaps outline, the nature of the discussion in each chapter. The principles and sources of efficiency are discussed in detail and a wealth of concrete illustrations cited. Among these are many of the classic applications of which we have read and which have shown in their

simplicity and results that the whole subject is well worth while.

Any instructor might easily learn many a lesson of value from the pages of the book—if he cared to investigate, for example, just how efficiently he is handling a section of students in any subject he may be teaching.

In Chapter XVII the author shows how the various efficiency methods advocated apply to such specimen departments of human thought and endeavor as psychology, education, sociology, business, etc. A brief historical survey is given in Appendix *B*.

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NOTES.

At the meeting of the London mathematical society on February 1 the following papers were read: By P. A. MACMAHON: "The significance of a certain algebraic function in the theory of distributions" and "The number of ways of pairing off the members of two identical sets of different quantities"; by W. H. SALMON: "Curves of constant torsion."

At the meeting of the Edinburgh mathematical society on March 9 the following papers were read: By G. B. JEFFERY: "The transformations of axes for Whittaker's solution of Laplace's equation"; by H. DATTA: "On the failure of Heiermann's theorem."

AMONG recent mathematical works published by Gauthier-Villars are the following: Œuvres de Cauchy, 2e série, Tome XII (Nouveaux Exercices d'Analyse et de Physique, Tome 2), Œuvres de Poincaré, Tome II, and two volumes of the Borel series of monographs, Leçons sur les Méthodes de Sturm dans la Théorie des Equations différentielles linéaires et leurs Développements modernes, by Professor MAXIME BÔCHER, and Intégrales de Lebesgue, Fonctions d'Ensemble, Classes de Baire, by Professor C. DE LA VALLÉE POUSSIN. Tome XIII, 2e série (Nouveaux Exercices d'Analyse et de Physique, Tome 3), of the Œuvres de Cauchy is now open to subscription, and Tome I of the Œuvres de Poincaré is in press.