Eötvös Competition Problems

Hungarian Problem Book I. Based on the Eötvös Competitions, 1894–1905 (120 pp.); **Hungarian Problem Book II.** Based on the Eötvös Competitions, 1906–1928 (128 pp.). József Kürschák. Revised and edited by G. Hajós, G. Neukomm, and J. Surányi. Translated from the Hungarian revised edition (1955) by Elvira Rapaport. Random House, New York; Singer, Syracuse, N.Y., 1963. Paper, $1.95 each.

These two volumes are a compilation of the problems used in the famous Hungarian Eötvös Competitions in school mathematics during the period 1894 to 1928; solutions of the problems, based on the revised Hungarian edition of Kürschák's original compilation, are included. Translation and publication of the volumes are part of the Monograph Project of the School Mathematics Study Group.

In the Eötvös Competition three problems are posed each year. Each examination contains at least one question from the field of algebra, including elementary number theory and combinatorial mathematics, and at least one from geometry, including trigonometry. An able American high-school senior who has had 4 years of mathematics should be able to understand the solution of every problem, yet the ingenuity required to discover the solutions for many of the problems might well tax the ability of many mature students. Most of the problems are so simply stated that they will appeal to the inquiring young mind as a fascinating puzzle.

Frequently two entirely different solutions are given for the same problem. Numerous notes, some of which are historical, are added to the solutions, but the greatest number are devoted to generalizations of the problem with a solution of the more general case. I have been told that such generalizations by the contestant count heavily in his favor in scoring his competition. In fact, it appears from the solutions given that merely solving the problem as posed might count very little. For example (1918/2): "Find three distinct natural numbers such that the sum of their reciprocals is an integer." A contestant might easily find by trial that 2, 3, and 6 satisfy the conditions, but the given solution is almost entirely concerned with proving the uniqueness of the result.

There are a few misprints and minor errors, and occasionally a geometrical figure is not completely labeled. However, in nearly all cases the intent is clear.

The number of eminent Hungarian mathematicians who were winners of the Eötvös Competition is evidence of the important role played by this competition in arousing interest in mathematics among secondary school students. The School Mathematics Study Group has performed another great service to school mathematics in the United States by making these excellent problems available. Hopefully the volumes will inspire the formation of a similar problem solving competition here.

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History of Technology

The Picture History of Inventions. From Plough to Polaris. Umberto Eco and G. B. Zorzoli. Translated from the Italian by Anthony Lawrence. Macmillan, New York, 1963. 360 pp. Illus. Until 31 December, $14.95; $17.50.

Presumably this volume is intended for the Christmas picture-book trade, but it turns out to be a surprisingly good history of technology. Within 350 pages (which include some 800 illustrations), the authors present a full and, on the whole, accurate summary of man's inventiveness throughout the ages. Their survey is much more than a dry chronicle of inventions, for they take into account the human and social relationships of technology.

Neither author is a professional historian or technologist: Umberto Eco (University of Turin) specializes in medieval esthetics, and G. B. Zorzoli (Polytechnical Institute, Milan) is a nuclear physicist. Yet they provide clear expositions of technical devices and processes, and they stress the continuity of technological principles, problems, and solutions throughout history. Sometimes they overemphasize this latter point, a tendency that leads to an unhistorical perspective in which all past developments are viewed in terms of present-day technology.

There are some omissions, the most serious being the slight treatment given to the development of machine tools. There are errors of commission too: the protracted discussion of cosmological systems does not belong in a history of inventions, and Leonardo da Vinci is given credit for having a much more direct influence on the science and technology of his time than the historical facts warrant. The arrangement of the material is sometimes confusing; for example, there is neither logical nor chronological justification for placing the chapter on electrical developments before the one on the invention of the steam engine.

To offset these minor faults, the authors give us brief but enlightening discussions of the development of automata and calculating machines, the esthetics of Gothic and modern architecture, the significance of printing and of time measurement, and the cultural impact of the cinema.

Unfortunately, the book has no scholarly apparatus; there is only an incomplete index of inventions and list of illustrations. Even more unfortunate in a book entitled a "picture history" is the fact that the reproduction of the illustrations ranges from poor to awful. Finally, the subtitle, "From Plough to Polaris," is misleading; the story begins with man's evolution before the plow, and the Polaris, which is mentioned on the title page, nowhere appears in the text! The authors have written an excellent short history of inventions; they deserved better treatment from their publishers.

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Mathematics

Calculus: Problems and Solutions. Abraham Ginzburg. Holden-Day, San Francisco, Calif., 1963. xii + 455 pp. Illus. $7.75.

One's reaction to a book of this kind will probably be conditioned by his attitude toward the role that solving typical textbook problems should play in the study of mathematics. All too often, to the student, the only goal seems to be that of getting the proper answers to the exercises at the ends of the various sections of his textbook, the exposition of the ideas involved being needed only for clues to accomplish this. This book, in which the author's stated purpose is "to increase his understanding and skill in handling