

possible participation of the Earth's core; the geological variations as supported or contradicted by paleomagnetic, paleontological or paleoclimatic evidence. A bibliography containing over 300 titles is appended.

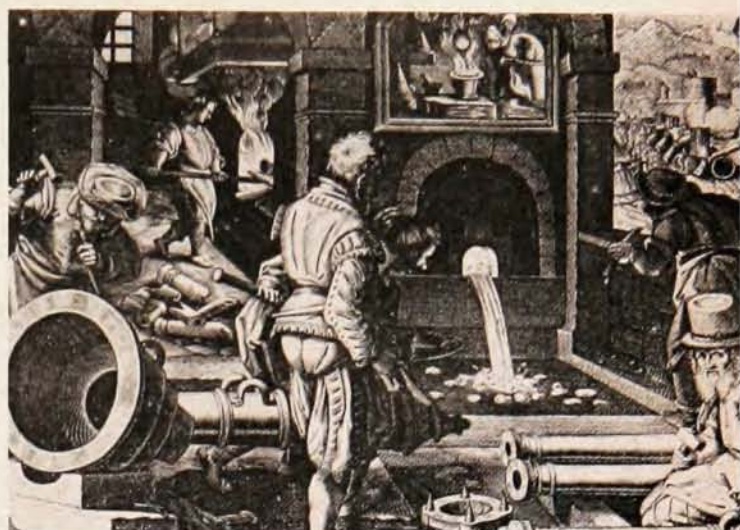
With all its valuable contents, the book is not an easy morsel to swallow. Little effort is made toward relieving the reader's task. The brevity of style and notations renders reading difficult and time-consuming, especially in the case of omissions [e.g., on p. 13, the author omits to say that equation (3.3.1) applies only to points on the axis of rotation]. The book is a manual for specialists, research workers in the same or adjacent fields, for whom a wealth of material and ideas is in store; it is less suited to the needs of the general scientific reader.

There are a few disturbing slips. Thus, on p. 5, in the first three lines of the text proper of the book, it is erroneously stated that "with a camera pointing vertically upward . . . the star trails appear as portions of concentric circles"; actually, except on the poles, the trails are portions of any non-concentric conical sections except circles. On p. 222, second line after equation (11.9.1), for σ twice the correct value is quoted; however, in the following equation, the energy contributed to the Earth's rotation by the solar atmospheric tide is evidently calculated with the correct value of σ .

The merits of the book greatly outweigh its shortcomings, as can be inferred also from its being the recipient of the Monograph Prize of the American Academy of Arts and Sciences for 1959 in the field of physical and biological sciences. It can be rated as an indispensable manual not only for those working in the very specialized field of the Earth's variable rotation, but also for the much wider circle of those concerned with its geophysical, geological, paleoclimatic, and cosmogonical implications.

A Short History of Technology: From the Earliest Times to A.D. 1900. By T. K. Derry and Trevor I. Williams. 782 pp. Oxford U. Press, New York, 1961. \$8.50. Reviewed by R. Bruce Lindsay, *Brown University*.

ALTHOUGH scientists are at pains to point out that science and technology are two different things, and although this fact is worthy of emphasis, it remains true that the relations between these two disciplines have grown closer with the years and at the present time are of overwhelming importance for mankind. Hence, all who are interested in science will examine with pleasure the history of the development of technology in the volume under review. The authors explain in the preface that their book is a sequel to the monumental five-volume *History of Technology* by Charles Singer, E. J. Holmyard, A. R. Hall, and T. I. Williams (Clarendon Press, Oxford, 1954-58). It is, however, not just a digest or summary of the larger work but an entirely new approach, in which an effort



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has been made to relate the evolution of technological processes to the general historical background. On the whole this program has been carried out successfully, though the emphasis is still largely on the methodical description of inventions, the way they worked, and how they were applied.

The treatment is in part chronological, in part topical. Thus, Part 1 discusses developments from the earliest times to A.D. 1750, and Part 2 is devoted to the period from the industrial revolution to A.D. 1900. Each part is prefaced by a general historical survey of the period from the standpoint of relations between industry and technology and the general life of the times. This is followed by chapters describing particular branches of technology, such as, in Part 1, the production of food, the extraction and working of metals, transport, communication, chemical industry, etc., and in Part 2, the steam engine, building construction, textiles, the internal combustion engine, and the electrical industry.

The text is very readable and is profusely illustrated by 353 figures, most of them from contemporary sources. There are also 35 pages of chronological tables comparing technological developments in different regions and relating them to general history. There is a satisfactory bibliography, as well as excellent subject matter and name indexes, which make the book handy for ready reference.

The only adverse criticism a scientist might make is the relative paucity of reference to the relations between technology and science. It is recognized, however, that this is an enormous subject in itself and adequate treatment of it would have been difficult in a book of this compass. Moreover, the most striking illustrations of the mutual influence in question have, of course, come in the twentieth century, which is not covered by the present work. The challenge to cope with this whole question still remains.