

considerations are here applied to the analysis of what occurs in the steam turbine as a whole.

The book is completed by three appendices; the first is on general thermodynamic relations, and the second is on the use of a steam diagram in which the co-ordinates are the total heat and the logarithm of the pressure. The third appendix gives the steam tables in the same form as that in which they were separately presented in his earlier publication.

It is not a book for beginners: it will be intelligible only to those who have a working knowledge of general thermodynamics and are fairly familiar with the use of partial differential coefficients. But engineers and physicists who have this equipment will find it a valuable work of reference. They will welcome so detailed a statement of original views and methods from one whom they gratefully recognise as a leader and a pioneer. Prof. Callendar writes with the authority of an investigator whose knowledge of steam and its properties is probably unique.

J. A. EWING.

Ore Deposits of Utah.

The Ore Deposits of Utah. By B. S. Butler, G. F. Loughlin, V. C. Heikes, and Others. (U.S. Geol. Surv. Professional Paper 111.) Pp. 672+lvii plates. (Washington, D.C.: Government Printing Office, 1920.) 1½ dollars.

THE series of monographs in preparation by the Geological Survey of the United States to summarise existing knowledge of the ore deposits of the separate American States will render readily available much valuable information now dispersed through a voluminous and scattered literature. The first of the series was on New Mexico (1910). The second deals with Utah, an area of special interest as regards both its geological structure and the variety of its ore deposits. The study of Utah has introduced many new conceptions into structural geology; some of them, like that of the laccolite, a term introduced for the Henry Mountains by Gilbert, have been fully confirmed; others, such as the support to antecedent rivers by the oft-quoted case of the Green River, have been set aside by fuller knowledge of the facts, or, like the igneous sequences proposed by Dutton and Spurr, are dismissed as too uncertain.

Utah has given exceptionally clear evidence of the importance of block faulting in determining the existing relief, and of the cause of such faulting by subsidence after long periods of igneous activity and earth movement. The views of le Conte and Suess, based on the earlier studies of

Utah, are fully justified by the latest contributions to its geology. The tectonic history of the region presents a significant coincidence with that of Africa in the importance of east-to-west folds in the late Cretaceous, and of subsequent north-to-south faults that may be even still in progress.

The economic geology of Utah is especially instructive on account of the remarkable variety of its ore deposits. Some, such as the silver sandstones, are well known owing to the controversy as to the origin of the ores; the authors of this survey adopt Lindgren's conclusion that they were sedimentary grains concentrated by hot water in consequence of the igneous intrusions. Probably the most valuable general conclusion in the volume (pp. 196-201, and the instructive diagram, Fig. 31) is that the quantity of the ore deposits beside masses of intrusive igneous rock depends on the lowering of the surface by denudation. This principle had been previously used to explain the contrast between the gold veins in the adjacent fields of Bendigo and Castlemain in Victoria, and also the fact that the ores beside the granites of Burma are richer beside narrow than beside the wider outcrops. It receives its fullest and most authoritative expression in this volume. The clearness of the diagrammatic figures of the ore bodies and tectonic structures is an especially notable feature of this important and well-executed monograph.

Medical Science and Practice.

- (1) *Obstetrics: Normal and Operative.* By Prof. G. P. Shears. Third edition, revised by Dr. P. F. Williams. Pp. xxii+745. (Philadelphia and London: J. B. Lippincott Co., 1920.) 35s. net.
- (2) *Principles and Practice of Operative Dentistry.* By Dr. J. S. Marshall. Fifth edition. Pp. xxix+711+xvi plates. (Philadelphia and London: J. B. Lippincott Co., 1920.) 35s. net.
- (3) *Diagnosis and Treatment of Brain Injuries: With and Without a Fracture of the Skull.* By Prof. W. Sharpe. Pp. vii+757. (Philadelphia and London: J. B. Lippincott Co., 1920.) 35s. net.
- (4) *Lippincott's Quick Reference Book for Medicine and Surgery.* By Dr. G. E. Rehberger. (Philadelphia and London: J. B. Lippincott Co., 1920.) 63s. net.

MESSRS. LIPPINCOTT'S series of textbooks on medical subjects is well known in this country. Many of the volumes, as is the case with two of the four under review, have already reached the third or later editions.

Like nearly all American books, they are