

Book Reviews

De Re Metallica. Reprint. Georgius Agricola; trans. from the 1st Latin ed. of 1556 by Herbert Clark Hoover and Lou Henry Hoover. New York: Dover, 1950. 638 pp. \$10.00.

A new edition of the Hoover translation of Georg Bauer's 16th-century treatise on mining, milling, and metallurgy has been an obvious need ever since the original 1912 translation became a collector's item, selling for \$100 or more per copy. Although the 1912 volume, printed and bound as nearly as possible like the Latin original, had a market that reflected the Hoover fortunes, it is a historical document that should be of such general interest as to be a sound publishing venture.

Any modern book on mining and metallurgy would not, of course, command much popular attention, but *De Re Metallica* should delight any serious reader, despite the technical character of the subject with which it deals. It is a handbook to guide the prospector, the miner, the mill manager, the metallurgist. It was one of the few technological handbooks on any subject available in 1556; hence it has value as a commentary on contemporary technology and science. It is also a fascinating example of bookmaking and book illustration, of scholarship, and of scientific knowledge and its application in central Europe 400 years ago. For those who may find the Hoover's meticulously technical translation formidable, the profuse illustrations will provide ample temptation and reward for prolonged study of the problems involved in finding, recovering, and processing mineral raw materials in Agricola's day.

Upon the professional miner and metallurgist, the book should have a humbling influence. Without benefit of mechanically powered machines, Agricola's contemporaries knew nearly all the tricks of the trade. The introduction of power has, to be sure, revolutionized the scale of extractive operations and has lowered the grade of ore from which commercial recoveries can be obtained. An industrial civilization has discovered uses for new elements and compounds that were unknown in 1556, and the quantitative requirements of modern industry would have staggered producers to whom a few tons were a respectable output. Yet these 16th-century miners and metallurgists already knew and practiced many of the basic methods and processes of ore and metal extraction. Indeed, it would be a simple assignment to name operations in this country, and especially in the other American republics, where mining and milling techniques are as primitive, and recoveries are as low, as they were in Agricola's time.

Georgius Agricola was a practical scholar, but amid the evidence of his practicality it is important that his scholarship not be overlooked or minimized. He apparently knew firsthand every operation in central Europe and some of those farther afield, and he was

reasonably well informed about many that he was unable to visit personally. He was a born textbook writer, and *De Re Metallica* is the best of his several books. A crank on detail, he was a master of exposition, but, even so, he left nothing to chance. Every operation and every mechanical device are delightfully depicted in carefully labeled diagrams that are alive. One is led to suspect that the literacy rate was not too high among the mine and mill managers and foremen, and that the many illustrations were aimed to make the book useful to these people.

The extraordinary excellence of the translation was duly noted when it first appeared in 1912. Mrs. Hoover was then given richly deserved credit for the patient mastery of the medieval Latin in which the original book was written, but the sure touch of the highly competent mining geologist and engineer is no less evident. It represents a perfect collaboration that has made an important book accessible to professional men, historians, and discriminating laymen who will appreciate an authentic insight into the past.

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Of Societies and Men. Caryl P. Haskins. New York: Norton, 1951. 282 pp. \$4.50.

Bold, sweeping, and yet careful, Haskins' book sheds new light on a neglected problem of evolutionary theory—the problem of societies. Darwinian biology and its later genetic modifications provide no satisfactory explanation of the origin and survival of societies as distinct from populations. Simpson's recent and distinguished volume on *The Meaning of Evolution*, for example, ignores the question of societies except with reference to *Homo sapiens*. Haskins has instead followed the tradition of Espinas, W. M. Wheeler, and Allee in realizing that communal existence in varied forms and in countless species, particularly among the insects and in man, offers a profound challenge to evolutionary theory.

He views the emergence of societies as one manifestation of a general earthly trend toward complexity and integration. Societies differ, however, with reference to their mode and degree of integration. First and most widespread is the evanescent family form, in which parents and offspring remain together for a time. Second is the associative form, in which adults come together in loose associations of schools, swarms, flocks, or herds. Third is the integrated form, in which a large population of specialized and interdependent individuals live permanently together. The first two forms are readily explained in evolutionary terms and are compatible with each other. But the third form, according to the author, is hard to explain because it is incompatible with the other two and yet is derived from one or both of them. The author points out that few "missing links" can be found