

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and bound as nearly as possible like the Latin original, had a market that reflected the Hoover fortunes, it is a historical document that should be of such general interest as to be a sound publishing venture.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

which represent the transition from the family-associated level to the integrated society, but he thinks he has one in the Philippine *Stenogastrine* wasps, where the daughters remain at home until mature, and another in the common bumblebee, where the first brood, composed of imperfect females, stays in the nest and cares for subsequent broods which grow into normal adults and depart.

The reason why the integrated society is incompatible with the family-associated form is that, in contrast to the latter, it gives very little scope to the individual. Its member organisms are highly specialized; they have lost functions that would be required of nonsocial organisms, and they resemble parasites (in this case parasites on the community itself), except that the community is composed of them and is hence dependent on their specialized contributions. At the family-associated level, however, the individual adult is a functionally complete and self-dependent creature. Accordingly, the conditions of survival are different for the two levels, which makes the development of the integrated society out of the family-associated level a big and difficult evolutionary step.

This theory sets the stage for the author's integration of human society. The odd thing about human social life is that it is a mixture of all three types—familial, associative, and integrated. Deriving from the loose primate group, it achieves its integrated character by a principle unique to human beings, the principle of cultural transmission, which allows far more rapid diffusion of innovations than does the process of mutation and also permits socially learned rather than structurally determined specialization. But, we are told, the mixture of principles in human society is a mixture of incompatibles. Most of our troubles arise from the fact that, on the one hand, the integrity and independence of the individual have survival value, whereas, on the other, the subordination of the individual is required. The human culture-society is therefore an uneasy balance between these two necessities, the one represented by democracy and the other by totalitarianism.

Whether or not one agrees with all the central argument, the fact remains that it is developed with great skill. The best sections are those which describe and interpret the variegated societal phenomena of the organic world. Such matters as parasitism, "slavery," genetic change, geographical conditioning, and communal interaction are handled with rare insight. Although too little attention is given to primate groups, thus occasionally pushing the argument dangerously close to an analogy between human and insect, the handling of the evolutionary place of the human culture-society is nevertheless striking. In my opinion the author should not have gone on to deal with different kinds of human social organization. Not only is it questionable that these kinds have any real analogues in the nonhuman world, but it is also apparent that, like so many natural scientists when they attempt to deal with our social life, the author grows emotional and moralistic in this part.

The specialist in societies will regret the absence of citations to the literature except in a general bibliography. Yet both he and the general reader will welcome a work of such scope and learning written with marvelous lucidity. An original approach to fundamental problems, it contains some of the most readable descriptive and analytical passages to be found anywhere. Despite its popular form, despite its reliance on brilliant insight rather than systematic rigor, the volume will rank as a classic in the literature of comparative sociology.

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The New You and Heredity. 2nd ed. Amram Scheinfeld. Philadelphia: Lippincott, 1950. 616 pp. \$5.00.

In the author's own words the purpose of this book is

to sift out from the genetics laboratories and various research fields the outstanding facts about heredity directly applicable to human beings; to present these facts in clear-cut, untechnical language, diagrams and illustrations; to point out what their significance may be to the individual and society, and, wherever there is room for argument, to leave the reader to draw his own conclusions.

The steps and processes by which findings were arrived at were to be largely omitted.

The purpose of the book has been fulfilled. It is a popular book in that it is for people in general, rather than for a select few, and is easy to understand. The style is clear, direct, and even familiar as a result of the frequent use of the pronoun of the second person, popular phrases, and occasional slang, as well as allusions to current events. The reader of the book should not be deceived, however, by the informal journalistic style into thinking that the treatment must necessarily be superficial. The style and the simplified diagrammatic drawings are a technique for making learning as painless as possible.

The author tells us that he started out as a "cub" reporter in Milwaukee in 1918 and spent years in newspaper and radio work; that his need of facts for a work of fiction originally led him to the study of human heredity; and that

before long I discovered that the findings in this field so completely shattered my own preconceived notions and the ideas held by all but an initiated few, as to obliterate my original plans. I became convinced that the most interesting and important task before me was to acquire as thorough a knowledge of the subject as I could and then communicate what I had learned to others.

The first edition came out in 1939. It had a wide distribution and was translated into a number of European languages. The new edition is extensively rewritten and enlarged by about 50% and contains some new and improved drawings and a number of excellent and highly original photographs. It covers a wide range of topics. In the first few chapters the fundamentals of Mendelian genetics are explained. The bulk