'GEOTHERMIE—Eine Einführing in die allgemeine und angewandte Wärmelehre des Erdkörpers.' by G. Butenbarth, Institute for Geophysics, Technical University of Clausihhal, West Germany; Springer., Berlin—Heidelberg - New York, pages 156, figs. 64, 1980.

The energy crisis facing mankind has resulted in renewed attention and importance given to Heat Flow and Geothermal Energy in the Earth. This book in German, written as an introductory text to students of geophysics, deals with the basic physics of Heat Flow, thermal properties of rocks and the present thermal state of the Earth's interior. What makes the book useful is the emphasis laid on the methods for determination of temperatures in the Earth's crust and interior, as well as on aspects of applied geothermal energy, like prospecting for and exploitation of geothermal energy reservoirs.

The first Chapter is devoted to physics of heat flow, wherein concepts like temperature-gradient, heat flow density and thermal and temperature-conductivity are discussed. Chapter 2 deals with the thermal properties of rocks, effect of pressure on the thermal conductivity in rocks, heat flow in anisotropic and porous rocks, the concept of specific heat and also radiogenic heat generation in the Earth. An entire chapter (Chapter 3) is devoted to the analytical treatment of processes of temperature-equilibration in the Earth's crust based on different models like lava-covered ground, cooling of dyke-rocks, cooling of intrusive spherical bodies etc.

The next chapter is concerned with the thermal state of the Earth's interior, wherein the author discusses also thermal aspects of plate-tectonics, in addition to short-term and long-term temperature changes. Chemical, mineralogical and geophysical methods of temperature determination are dealt with in Chapter 5, making it extremely interesting to the geologist. The SiO_2-and Na-Ca-K-thermometers are given as examples based on solubilities and chemical equilibria. The author also discusses isotopic ratios (O^{18}/O^{16}, C^{13}/C^{12} and S^{34}/S^{32}) as geological thermometers. Trace elements in salt-rocks and ores as indicator of temperatures is discussed in this chapter. Mineralogical thermometers like the garnet-pyroxene thermometer, and the degree of coalification of organic matter in sediments as a geologic thermometer is also discussed. Geophysical methods of temperature determination dealt with include, bore-hole logging, gravity, geolectric, magneto-telluric, Curie-surface and seismic methods.

The last chapter enumerates methods of prospecting for geothermal reservoirs by mapping of hydrothermal changes in rocks, infra red measurements, gravimetric, geoelectric and seismic methods. Utilisation of thermal waters, steam and moisture-free hot litho-units for room-heating, hot-water supply and conversion into electrical energy are discussed. The author also dwells on the environmetal aspects of the utilisation of geothermal energy sources in this concluding chapter.

The richly illustrated book (64 figures), is a comprehensive introduction to geothermal energy, not only useful to geophysicists but also to all others in the field of Earth Sciences with an interest in Geothermal Energy as one of the potential alternative energy source. It is hoped that the publishers would bring out an English translation of the book, thus making it available to a larger readership as an introductory text.

M. S. RAO