Book Review

Geoelectric and Geothermal Studies

Editor-in-chief: A. Ádám, KAPG Geophysical Monograph, Akadémiai Kiadó (Publishing House of the Hungarian Academy of Sciences), 752 pp, Budapest, 1976, \$ 48.00.

This is truly a unique book summarizing the geoelectric and geothermal studies conducted in the eastern European socialist countries (so called KAPG countries) during the period 1960–1973. In many problems in solid earth geophysics and geology, thermal energy in the earth plays the most dominant role. Studies on the thermal state of the earth, thus is of essential importance in the earth science. Electrical properties, especially electrical conductivity, of the earth's interior are probably highly temperature-dependent. Therefore, magnetic induction studies would obviously be a powerful tool for understanding the thermal state within the earth. With this recognition, attempt to coordinate the geoelectric and geothermal studies has been very seriously been made in the KAPG countries. Similar attempts have been made in non KAPG countries, also, for example, in Japan, United States, Canada. But they seem to be less seriously coordinated compared with that in the KAPG countries as reported in this book.

This book consists of six chapters and contains nearly eighty original and review papers. Six of these chapters are edited by well known experts and two of them consist of a single article written also by well known experts:

Chapter 1, Collecting and Processing of Geothermal Data (ed. Ch. Oelsner) contains nine papers dealing with the method of obtaining and processing geothermal data, e.g. marine heat flow measuring device by E.A. Lubimova and G.A. Tomara (USSR), infra-red surface geothermics by Ch. Oelsner (GDR), thermal conductivity measurements by M. Krešl (Czechoslovakia) and U. Seipold (GDR), computer programs for heat flow data processing by V. Čermák (Czechoslovakia) and so on.

Chapter 2, Collecting of Geoelectric Data: Theory, Data Processing, Limitations (ed. G. Fanslau and Porstendorfer) presents fourteen papers on geoelectric data. Here the problems are considerably more complex than the geothermal. Fundamental aspects in geoelectrodynamic methods are discussed in most of the papers, special emphasis being laid on the horizontal inhomogeneity and anisotropy of the structures and of inducing fields. In the introduction of the contribution by M.N. Berdichevsky and V.I. Dimitriev (USSR) entitled "Basic

principles of interpretation of magnetotelluric sounding curves," one finds a statement "Until recently our knowledge of the character of field distortions was very poor and MTS (magnetotelluric sounding) practice abounded in examples of unconvincing, voluntaristic interpretations discrediting the possibilities of the method." The reviewer and perhaps many geophysicists would share this view. The efforts of KAPG scientists to overcome this difficult situation will be found in the papers of this chapter.

Chapter 3, "The Electrical Properties of Rocks at High Temperatures and Pressures" was written by M.P. Volarovich and E.I. Parkomenko, both of whom being renowned experts on the subject. The Chapter (almost fifty page-long) is divided in nine sections and deals with wide aspects of electrical conductivity of earth-forming materials in laboratory as well as in nature.

Chapter 4, "Geothermal Data and Their Complex Interpretations on Test Areas" (ed. V. Čermák, Czechoslovakia) consists of fourteen papers on heat flow in the KAPG region and its interpretation. Specially important are the heat flow and geothermal temperature distribution maps of Central and Eastern Europe (compiled by B. Čermák and E.A. Lubimova for heat flow and by L. Stegena, Hungary, for temperature). One would be surprised to find so many land heat flow measurements have been made in these countries, including GDR (E. Hurtig and P. Schlosser), Poland (J. Majorowicz, S. Plewa and M. Węsierska), Czechoslovakia (V. Čermák), Hungary (L. Stegena), Bulgaria (T. Velinov), USSR (R.I. Kutas, E.A. Lubimova, Ya. B. Smirnov, I. Buachidze, S.V. Lysak, L.S. Sokolova and others).

Chapter 5, "Deep Electromagnetic Investigation and Their Geothermic Interpretation on Test Areas" (ed. A. Ádám and M.N. Berdichevsky) would probably be the highlight of this book as A. Ádám, the Editor-in-chief writes in the Introduction "The main task of this monograph is to analyse the connections between the results of geothermic and magnetotelluric investigations." Thirty six papers are devoted to this subject, each trying to make sense out of the results of two disciplines in the various regions: I. German-Polish Sedimentary Basin, II. Czechoslovakia, III. Pannonian, Basin, IV. East Carpathians, V. USSR (except Carpathians). Some papers even try to deduce tectonic evolutionary history of the region from geothermal and geoelectric data, e.g. L. Stegena on the Pannonian Basin. Several papers are devoted to the Asian part of USSR. As the editors point out there seem to be notable differences and contradictions in the interpretation in various papers, attesting to the great difficulties in this subject and to the very fact that the study has just begun.

The last Chapter 6, "On the Nature of Conductive Layers in the Earth's Crust and Upper Mantle" is a single paper by I.S. Feldman (USSR).

The text of the papers in this monograph are often highly specialized in

nature and not always easy to fully understand for non-specialists. The reviewer obviously is not capable of properly evaluating the scientific merit of all the papers, but he is convinced that it is most important to publicize through this journal the very existence of this book to the geophysicists of the non KAPG countries.

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