A unique feature of this book is a Table at the front of each case study in which each reservoir example is summarised with characterisation of the geologic setting, tectonic style, size of field, nature of reservoir and trap, petrophysical data of reservoir rocks, reserve and production data, hydrocarbon source, age of reservoir formation, etc. In the Appendix, the geologic classification and many esoteric terms used in case studies, familiar to carbonate sedimentologists but unfamiliar to many of their reservoir engineer colleagues, are summarised in a Glossary and an illustrated outline of classifications.

A noticeable deficiency is that Tertiary carbonate reservoirs are poorly represented. However, this does not, in any way, reduce the value of the book. The book is an excellent contribution and a valuable document for professional geologists like petroleum geologists, carbonate sedimentologists and production and development geologists, as also for the reservoir engineers. Academics will also find valuable information on carbonate sedimentology.

Oil and Natural Gas Commission
Dehra Dun

S. K. BISWAS

CONTRIBUTION TO THE HISTORY OF GEOLOGICAL MAPPING—E. Dudich (Editor). Publisher: Akademiai Kiado, Budapest, 1984, 442 pages, Price: 34 US Dollars.

The International Commission on the History of Geological Sciences (INHIGEO) organised a symposium on the historical development of geological mapping in connection with progress in geological thinking under the aegis of the Central Geological Authority of geological research in Hungary at Budapest during 16-22, August 1982. The book under review contains the proceedings of the symposium. There are 64 papers of which 24 are only abstracts. The topics covered are broadly the trends in the development of geological mapping, historical stages in geological mapping of different regions, evolutions of specialised map types and individual achievements of outstanding scientists in the thematic field of the symposium.

The plotting of gold fields in Egypt on papyrus in the 13th century is pointed to be perhaps the first 'geological' map. The first compilation of a geological map, we are told, was undertaken by M. Lister at the end of the 17th century (Pavlinov, p. 31).

The paper by Dudich summarises the diversification of earth science maps from the traditional, representing observation of outcrop and solid geology, to a great variety of maps which include geochemical and geophysical maps passing into three dimensional block diagrams and multi-horizon transparent maquettes. The range is unlimited with multi-purpose map series depicting a variety of aspects, computerised plotting and processing of geocartographic information, mapping of the sea floor, airborne surveys, geology in orbit and finally the frontiers of outer-space which cover the entire solar system as another step on the road to reach the stars.

Under the section on regional development, the historical stages and the status of geological mapping of different regions and countries are described. This chapter is by no means complete since only a few continents are covered. Europe including

the Asian Russia has received the maximum coverage. The only reference to India is in the abstract by Ashgirei. His treatment of the historical development in the geological mapping of the Western Himalaya is incomplete and totally ignores the contribution made by the Geological Survey of India. India has a great tradition in geological mapping and map production. Perhaps a contribution from India would have set the record straight.

Among the Asian countries, the status of geological mapping in the neighbouring country China is of interest to us. The paper by Zheng and Wang deals with the history of geological mapping during the last 30 years. By 1980, we are told that 93.2 per cent area had been mapped on a scale of 1 : 1,000,000, 53.7 per cent on 1 : 200,000 and only 1.2 per cent of the total area on 1 : 50,000 scales. India during the same period had covered 45.7 per cent of the total area on 1 : 50,000/ 63,360 scale.

Khain's abstract contains the history of the compilation of International Tectonic Maps which involves international efforts. India has made a major contribution in this field by preparing the *Tectonic Map of South and East Asia* by D. K. Ray which was printed in colour by the Geological Survey of India in its press at Hyderabad.

The paper by Patz on the importance of geological mapping for the development of oil-geology as an independent discipline is of great significance for similar studies in India.

The increasing utility of isopatch maps in combination with structural maps in platform areas as a reliable source of information on deep structures and in prospecting and exploration for oil, gas and other mineral resources has been highlighted with examples from the Russian platform. The mapping of Quaternary deposits has also facilitated the establishment of the number of glaciations on East-European plain and their extension. The development of bauxite-geological mapping in Hungary is of great interest. There are also references to the mapping of coal basins of the world. The engineering-geological maps mark a new epoch in the progress of mankind's knowledge about our natural environment. The mapping of subterranean waters according to their different features, both in depth and in plan in another interesting aspect covered.

The last section of the book is devoted to individual achievements of outstanding scientists in the field of geological mapping and map making. This records the services of some individual geologists who, by their hardwork, uncanny foresight and scientific optimism contributed greatly towards the discovery of new resources in their countries.

Geological mapping is an unending process. It offers an unlimited scope to cover terrains on larger and larger scales based on a variety of themes. With the increase in the scale of mapping more details can be plotted which imparts clarity and depth to geological maps without which our understanding of this planet is never complete. Hooykaas, the President of INHIGEO, in his closing remarks states 'Geological practice is facilitated by instruments and other auxiliaries, amongst which maps occupy an important place. They provide a geological description of large areas in short-hand which exceeds in efficiency the intricate verbal descriptions'. The geological mapping will always remain the fundamental prerequisite of any geologist.

The tenth INHIGEO symposium has covered a broad-spectrum of topics in the realm of geological mapping. It deals not only with the history of geological cartography but also the theoretical thought behind it. It has focussed the attention of geoscientists on the importance of geological map compilation on a veriety of themes. Publication of geological maps promotes dissemination of scientific information. The symposium volume has served the purpose of conveying this message. The Hungarian Academy of Science are to be congratulated for bringing out this volume and we trust it will promote similar efforts at the national level.

A. M. S. E. Wing,
Geological Survey of India,
Bangalore 560 001.

S. V. SRIKANTIA

PROSPECTS FOR MINERAL RESOURCE ASSESSMENTS ON PUBLIC LANDS: PROCEEDINGS OF THE LEESBURG WORKSHOP. By Simon M. Cargil and Steven B. Green (Eds.) U. S. Geological Survey Circular 980 (1986) pp. 330.

The United States Geological Survey (USGS) and the Geological Survey of Canada (GSC) have a Memorandum of understanding to undertake cooperative research and enter into collaborative ventures. The two agencies discussed at a workshop at Leesburg (September, 1985), the state-of-art in mineral resource assessment (especially the metallic minerals) and the probable paths of future development. The present circular is an aftermath to the Leesburg workshop. The discussions centred round three core themes: (i) The user's perspective, (ii) the technical perspective, and (iii) conclusions and critiques.

The value of Canadian mineral production (including fuels) is about $ 43 billion (Canadian). Minerals and fuels account for nearly 10% of Canada's Gross National Product and over 20% of Canada's export earnings. There are about 300 underground and open-pit mines in Canada and about 175 communities that are primarily dependent on mining. About 50% of domestic rail traffic is minerals or mineral products. This concept that geoscientists must be in a position to translate the results of assessment into nontechnical terms that can be understood and used by policy makers and economic analysts is what many of the participants advocate. A praiseworthy interaction exists between the United States Forest Service (USFS) and US Department of Interior for regulating and managing mineral activities in the National Forest System. They work together to ensure that mining development and surface resources use are harmonious, encouraging orderly exploration and development of mineral resources and at the same time protecting surface resource uses. It is in this direction that the Stanford Research International, funded by the U.S. Geological Survey, developed the PROSPECTOR system—the first successful application of artificial intelligence in resource assessment. These are just few examples of the aspects dealt with in the user's perspective.

Mineral deposit models (empirical and genetic) represent the digestion of a great mass of geological information. To develop an atlas of 'areas of analogous Geology' for mineral deposit models, to undertake retrospective statistical evaluation of the effectiveness of individual measurement techniques and observation currently in use in environments hosting differing mineral deposit types, and to develop the means to ensure continuous interaction among the practitioners of all