

Book news

1. Reviews

● *A concise world atlas of geology and mineral deposits*, by D. R. Derry. London, Mining Journal Books, 1980.

(Reviewer: B. C. Alberts)

The Atlas is divided into three well-organized sections, each one concise and clearcut, in a modern presentation of basic geological information.

The first part provides a very short description of the development of the crustal structure of the earth through processes resulting in the distribution of land masses as expressed by the concept of crustal plate tectonics.

A series of ten coloured maps constitutes the most attractive part of the atlas. They illustrate effectively the crustal geology of the main land masses of the world by means of a system of distinctive colours related to radiometric dating of rocks, thus indicating fundamental periods of geological history. This style of illustration advantageously eliminates stratigraphic nomenclature, which could be confusing to lay readers. Each map is followed by a brief description of the geological events that shaped the relevant crustal region, and the description conveniently relates directly in sequence to the legend on the map.

The final part of the atlas provides condensed data on the distribution and production of the more important metals and minerals and their geological relationship. Less statistically minded readers might have preferred some additional small-scale world maps illustrating the distribution, extent, and trade flow of particular mineral resources.

The atlas is professionally well prepared to serve as a useful reference for all people interested in geological science and the minerals industry.

● *The geology of the Western Cordillera of northern Peru*, by various authors. London, Institute of Geological Sciences, Overseas Memoir 5.

(Reviewer: C. E. Feather)

The Western Cordillera of Peru constitutes the entire mountain province from the latitude of Lima to the border with Ecuador, an area of over 150 000 square kilometres. Altitude and vegetation vary considerably over this area, and the geologists had a difficult task in mapping and describing its geology. The contributors include several Peruvian geologists, officers of the Instituto de Geología y Minería de Perú, staff of the Institute of Geological Sciences, London, and members of Liverpool University. Previously published work is sparse, but the authors have researched it thoroughly. Even with the present contributions, however, the overall quality of the information is uneven, but the treatment of the topic is synoptic and, in some cases, highly detailed, especially where an abundance of new information has become available.

The authors have presented their findings under the following chapter headings: stratigraphy; structure; the Coastal Batholith; the Cordillera Blanca Batholith and the high-level stocks; radiometric ages; geochemical evolution of the intrusive and volcanic rocks of central

Peru; reconnaissance mineral exploration; review of mineralization and metallogeny; and geomorphology.

The bulk of the geological formations of this mobile belt are of Mesozoic and Cenozoic age, resting with marked unconformity on a basement composed of metamorphosed Precambrian to Lower Palaeozoic units and less-metamorphosed Upper Palaeozoic formations. As might be expected from the theories of Continental Drift, the older rocks outcrop only in the east. The younger formations represent a succession of up to 6000 metres of volcanics, limestones, marls, shales, and sandstones. Regional block faulting has controlled sedimentation and subsequent deformation.

The sedimentary formations were intruded by two great batholiths that have contributed to the uplift and structure of the Western Cordilleras. Both are elongated and parallel to the continental margin. The Cordillera Blanca Batholith is of Late Miocene age and lies 300 kilometres inland, and averaging 200 kilometres from the sea is the long Coastal Batholith, which dates from mid-Cretaceous to Neogene. The authors have presented much new information on this latter batholith. Chemistry, mineralogy, structure, and evolution are dealt with in considerable detail.

As part of a technical co-operation programme, a low-density reconnaissance geochemical-exploration programme was carried out involving stream sampling. An area of 25 000 square kilometres was selected that is further inland than the coastal copper province and the adjacent polymetallic province. Several copper anomalies were located, some associated with molybdenum, and others with lead, zinc, and silver.

The book is illustrated with 81 figures and 8 plates, and is completed by a geological map in two sheets, drawn at a scale of 1:500 000. The text is eloquent and unambiguous, and the book obviously represents a significant contribution to our knowledge of the geology of Peru.

2. New books

● *Influence of diffusion coatings on the strength of steel*, by G. V. Karpenko, V. I. Pokhmurovskii, V. B. Dasilov, and V. S. Zamikhovskii, second revised and updated edition by A. Aladjem. Aedermannsdorf (Switzerland), Trans Tech Publications, 1979. 200 pp. Sw. Fr. 68.00.

Diffusion coatings on steel not only prevent environmental attack but can also improve the mechanical properties. The present volume is primarily directed towards an understanding of the structure of the diffusion layers formed and their influence on the mechanical properties of steels.

● *Mechanical and corrosion properties*, by G. S. Ansell, P. Haasen, J. Weertman, D. J. Fisher, U. Gramberg, and F. Wöhlbier (editors).

— 1980 Volumes 13–16, 800 pp. Approx. 3000 evaluated reviews and data compilations. Hard cover 4-volume set Sw. Fr. 360.00

- 1981 Volumes 17-20, 900 pp. Hard cover 4-volume set Sw. Fr. 360.00.

1975—Complete 20-volume set, 5000 pp. Hard cover 20-volume set Sw. Fr. 1200.00

Aedermannsdorf (Switzerland), Trans Tech Publications.

These volumes aim to combine the advantages of abstract publications with the well-digested presentation of handbooks. Each volume features some 600 - 1000 extended abstracts, with the most important new data presented in the form of hundreds of graphs and tables. Within each volume, the material covered is arranged by both material and subject. In addition, cross-indexing ensures easy access to all aspects of the new research results reviewed.

● *Heat-resistant and refractory steels*, by K. L. Lanskaya. Aedermannsdorf (Switzerland), Trans Tech Publications, 1979. 266 pp. Sw. Fr. 86.00.

Metallic materials subjected to sustained operation at

elevated temperatures, regardless of their ultimate use, have to meet specific requirements, the most important of which is heat resistance (strength at elevated temperatures). The heat resistance of steels depends on the crystal structure and the strength of atomic bonds in the crystal lattice of the component phases. By changing the structure, the heat resistance of steels can be varied within wide limits. Usually, the structure can be changed by alloying or by heat, or by combined heat-mechanical treatment. Maximum heat resistance is obtained by a combination of alloying and heat treatment.

● *Hardening of metals*, by P. Feltham (editor). Aedermannsdorf (Switzerland), Trans Tech Publications, 1980. 316 pp. Sw. Fr. 78.00.

This book presents a collection of review papers on topics of key importance in improving current understanding of the deformation behaviour of metals and alloys.

Precious metals

The 6th International Precious Metals Conference will be held in Newport Beach, California, from 7th to 11th June, 1982.

The theme of the Conference is 'Precious Metals Serving Mankind Today and Tomorrow', and the topics will include the following:

- Health and environment
- Space, energy, and communication
- Investments and economics
- Mining and exploration
- Recovery and refining

- Precious metals in catalysts
- Electroplating
- Jewellery and art
- Analysis
- Security
- Dental

Further information is available from the International Precious Metals Institute, Polytechnic Institute of New York, 333 Jay Street, Brooklyn, New York 11201, U.S.A.

Strata mechanics

A symposium on Strata Mechanics is to be held in Newcastle-upon-Tyne from 5th to 7th April, 1982.

Over the past thirty years, mining of coal and stratified mineral deposits has become increasingly capital-intensive, and the level of investment demanded by modern methods has led to demands for improved assessment of their likely performance. Despite extensive recent research into the reaction between mining methods and strata behaviour, there has not been a radical change in the approach to design. As implied by the use of terms such as 'strata control' and 'ground control', this remains largely empirical and non-analytical.

The particular aim of the Symposium will be to improve the design of underground mine structures through a better understanding of the mechanics of rock deformation and fracture induced by excavation. The emphasis will be on a mechanical rather than an empirical approach to design.

Papers are invited that will relate observations of strata deformation resulting from the excavation of various structures to the mechanical behaviour of the

associated strata. Suggested topics are based on the major type of underground structure, although it is accepted that some interaction and some more general approaches may be desirable. Suggested topics are:

- Shafts, insets, major surface drifts and adits.
- Tunnels and cross-measures drifts.
- Access roadways to working areas and in areas affected by mining.
- Room and pillar and shortwall workings.
- Advancing and retreating longwall workings.
- Alternative structures and methods of working.

Authors are invited to submit a brief (200 words) and extended (1500 words) abstract of papers on these or related topics following the general theme of the Symposium.

Further information on the Symposium can be obtained from Ian W. Farmer, Department of Mining Engineering, The University, Newcastle upon Tyne, NE1 7RU, England. Telephone: (0632) 28511, Extension 3117.