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ARIZONA GEOLOGICAL SOCIETY DIGEST VOLUME XI Proceedings of the PORIPHIYIRY COPPER SYMPOSIUM **TUCSON, ARIZONA / MARCH 18-20, 1976**

A SYMPOSIUM SPONSORED BY THE ARIZONA GEOLOGICAL SOCIETY AND THE UNIVERSITY OF ARIZONA



Blasting at Morenci, Arizona-Ray Manley Photography, courtesy of Phelps Dodge

POSTSCRIPT

to

Arizona Geological Society-University of Arizona

PORPHYRY COPPER SYMPOSIUM

March 18-20, 1976 Tucson, Arizona

The Arizona Geological Society was pleased and honored to join The University of Arizona in being the host for this Porphyry Copper Symposium. The continued interchange of words, thoughts, and deeds of the mineral resource industry is indeed rewarding.

Over the past several years, this free exchange of ideas on porphyry copper deposits and exploration has come about with the realization by mining explorationists that more can be gained than lost by presenting scientific descriptions and discussions on mineral deposits and properties. With the impending explosive demand for new mineral deposits, the development of new concepts and ideas and a better understanding of the genesis and occurrence of our mineral deposits are important for our country. The competitive edge a company may hold in the search for new deposits is rarely blunted by release of scientific data on mineral deposits. Rather, the competitive edge is enhanced by the practical synthesis of new ideas and new concepts.

It is therefore particularly gratifying to the organizers of this Symposium to be able to present data on 17 porphyry copper deposits as well as on 13 topical subjects related to porphyry copper exploration and geology. The inclusion of reports of nearly half the known porphyry copper deposits in the southwestern United States about which little or no information has been released is an indication of the mineral worth of this sector.

This outstanding free exchange of ideas and data—incorporated in a symposium—was provided by a combination of 14 mining companies, 3 consultants, 5 universities, and the U.S. Geological Survey. This represents an outstanding realization of the purpose of our Symposium.

Undoubtedly many more porphyry deposits will be found by explorationists both here and in adjacent areas, and may the spark that generated and expanded the concept into a viable commodity have been fed by the association of the past days and nights!

We hope that this free exchange can be continued in the future with more symposiums, scientific meetings, and publications. We as individuals working in porphyry copper geology can only increase our knowledge and understanding of our field; as a result, both we and our companies are the ultimate beneficiaries of this Symposium.

March 19, 1976

James D. Sell and Charles P. Miller Co-General Chairmen

PREFACE

No serious reader of this <u>Digest</u> can be unaware of the state of the copper mining industry in 1978 nor need be cautioned that these articles reflect economic conditions of 1976 and technical developments to that time. Although publication of these articles had been delayed in part by the depressing events following the Symposium, the Society believes that papers of a descriptive nature remain sufficiently current to warrant publication at this time. Some papers given at the Symposium were not available, and abstracts were reprinted from the Symposium program in the interest of completeness. Expanded abstracts were furnished by some authors in lieu of full-length manuscripts. Current affiliations of authors are provided.

The editors acknowledge Dr. Evans B. Mayo, Professor Emeritus of Geosciences, The University of Arizona, for critical review of many of the papers and Dr. John S. Sumner of the Department of Geosciences, The University of Arizona, for technical assistance. We are especially grateful to the various authors for their patience and courtesy during this period of delayed publication. —The Editors.

September 1978

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Information for Contributors to the Digest

The <u>Digest</u> is issued periodically by the Society as an informal bulletin intended to present technical papers and progress reports of research bearing on geological problems of Arizona in particular and the Southwest generally. The editor welcomes such papers as well as notes and news of geological and related activities within this broad framework.

Manuscripts submitted for publication should meet the following requirements:

1. Manuscripts must be typewritten and double spaced throughout (including abstracts, quotations, and list of references cited).

2. Current $\underline{\text{Digest}}$ style should be followed in the preparation of the manuscript, with special attention to citation of references.

3. Abstracts, not exceeding 300 words, are required for all articles.

4. Drafted illustrations should be carefully prepared in waterproof black ink on drafting stock or Mylar. Lettering should be done with lettering guides or machines. Size of illustration and lettering and especially patterns should permit reduction to <u>Digest</u> format. Consultation with the editor is invited to determine current format. Illustration titles should be typed on a separate sheet of paper and not lettered on the illustrations.

5. Photographs should be sharp, glossy, black-and-white prints and kept to a minimum.

6. The original and one copy of the manuscript, including illustrations, should be submitted. Manuscripts and inquiries may be addressed to:

> Digest Editor Arizona Geological Society P.O. Box 40952 Tucson, Arizona 85719

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