

Crown Point Area, New Mexico

- 4:20 J. L. RIDGLEY: Roll-Type Uranium Occurrence at Dennison-Bunn Claim and Possibility of Uranium Deposits in Eastern Part of San Juan Basin, New Mexico
- 4:40 R. R. RAWSON: Uranium in Todilto Limestone—Sabhka-Like Deposit

Wednesday, May 16, 1979

- 8:30 R. H. DE VOTO, R. H. MEAD: Use of Helium in Uranium Exploration, Grants District, New Mexico
- 8:50 H. M. BIVENS ET AL: Direct Measurement of Uranium by Prompt Fission Neutron Method of Pulsed Neutron Borehole Logging
- 9:10 D. L. HAYSLIP ET AL: Thermoluminescence of Uranium Host Rocks in Ambrosia Lake Area
- 9:30 D. D. RUNNELS ET AL: Computer Modeling as Applied to Hydrochemical Exploration in Solution Mining
- 9:50 R. L. FLEISCHER, A. MOGRO-CAMPERO: Radon Emanation Over Orebody: Has Long-Distance Transport of Radon Been Observed?
- 10:10 Break
- 10:30 W. D. CONINE: In-Situ Uranium Leaching—Comparison of New Mexico with South Texas
- 10:50 J. W. MELVIN: Uranium Royalties and Severance Taxes in Grants Region—Effect on Minimum Producing Grade
- 11:10 D. G. BROOKINS: Mechanisms for Uranium Deposition in Grants Mineral Belt
- 11:30 F. F. LANGFORD: Stratigraphic Control of Uranium Deposits

ABSTRACTS OF PAPERS

AUSTIN, S. R., Bendix Field Engineering Corp., Grand Junction, Colo.

Dissolution and Authigenesis in Host Sandstones

Empty or partly empty shells that conform to detrital rather than original crystal shapes of sanidine grains are present in host sandstones of the Morrison Formation. This somewhat paradoxical situation is explained by removal of sodium from a surface layer of the detrital grain during weathering, with concomitant conversion of this layer to microcline, which resists dissolution under conditions prevailing after sedimentation. During compaction, dissolution of this outer layer occurs at pressure points; once this layer is penetrated, dissolution of the interior proceeds along crystallographic directions and removes all or part of the unaltered sanidine.

Untwinned microcline also is present as minute crystals within shells and as outgrowths on both detrital potash feldspar grains and (rarely) on the shells. Uraniferous organic material occurs both under and over some outgrowths on detrital microcline, suggesting contemporaneity of outgrowths and organic material. Elsewhere, chlorite, reportedly contemporaneous with coinite, coats both exteriors and interiors of feldspar shells and thus succeeds feldspar dissolution; calcite supercedes rather than replaces feldspars. Quartz outgrowths are commonly earlier than uraniferous organic

material but later than jordanite. Locally, chlorite and/or hematite form total or partial pseudomorphs after pyrite. Rarely, marcasite is partially pseudomorphous after, and forms outgrowths on, pyrite.

These and similar observations by others reveal fragments of a paragenetic sequence complicated by the presence of both primary and redistributed ore. Further investigations may complete a sequence useful in determining conditions of mineralization, and thus in the discovery of similar ore deposits.

BIVENS, HUGH M., DAL H. JENSEN, RALSTON W. BARNARD, and WILLIAM A. STEPHENSON, Sandia Laboratories, Albuquerque, N. M.

Direct Measurement of Uranium by Prompt Fission Neutron Method of Pulsed Neutron Borehole Logging

The capability provided by neutron logging techniques for the direct measurement of uranium is extremely valuable, especially in low-grade uranium mineralization not in equilibrium. Sandia Laboratories is developing one of these techniques which is based on the detection of epithermal prompt fission neutrons that result from the irradiation of uranium by 14 MeV neutrons from a pulsed neutron generator. A 70-mm O.D. development-model logging probe has been used in a limited field evaluation of the prompt fission neutron method of logging. From this evaluation has evolved a prototype logging probe and the basis for log interpretation. Additional logs required for interpretation are a caliper log and a density log. Additional probe development is under way including a neutron generator with a neutron output greater than 10^9 n/s. A vendor is being developed as a commercial source for the neutron generator. A definition of the interim logging system has been released and the system eventually developed will be defined in the open literature.

BROOKINS, D. G., Univ. New Mexico, Albuquerque, N. M.

Mechanisms for Uranium Deposition in Grants Mineral Belt

A polygenetic model for uranium deposition of much of the ore in the Grants mineral belt results from (a) spatial relations of orebodies, (b) geochronologic studies, (c) clay-mineral studies, (d) trace-element studies, and (e) theoretical considerations. Trend ore apparently formed from southeast-flowing solutions entirely in reduced ground with organic carbon (plus some hydrogen sulfide) acting as reductant; this is supported by evidence for organic carbon in calcite penecontemporaneous with ore, trace-element distribution, and other factors. Uplift, remobilization, and reprecipitation of some of the stratigraphically high ore in the Laguna district is somewhat similar to Wyoming roll-type deposits in terms of mineralization control by sulfide-sulfate equilibria and clay-mineralogical variations. The effect of this event is not apparent in the deeper Ambrosia Lake ore. The Laramide orogeny resulted in the establishment of a redox front which, in turn, resulted in destruction and remobilization of some earlier trend ore and the forma-