hydrothermal episodes. The distributions of thallium, manganese, arsenic, silica, and alumina suggest that proximal gold deposition occurs when cool oxygenated neutral sea water mixes with venting hydrothermal solutions. During mixing, chemical complexes stabilize gold in the outward flowing solutions. Distal facies deposition occurs when anoxic conditions are encountered. Concentrations of thallium and lithophile elements are exploration targets for proximal gold deposits while arsenic, manganese, and silica/alumina provide targets for distal occurrences.

WEDNESDAY, MARCH 5, PM

JACKLING LECTURE
(M&E)

2:00 PM — Elmwood Room

On Wednesday, March 5, Carroll O. Brawner will deliver the Jackling Lecture, **"Recent Lessons that have been Learned in Open Pit Mine Stability, with Case Examples."**

Brawner is professor of Geomechanics in the Mining & Mineral Process Engineering Dept. at the University of British Columbia.

He was chosen to receive the award, **"For his prodigious work related to stability problems in mining, especially his work in open pit mining and tailings dams."**

THURSDAY, MARCH 6, AM

GEOLOGY

9:00 AM — **Elmwood Room, Hilton**

Chairmen: D. E. Ranta, AMAX Exploration, Inc., Golden, CO
J. W. Babcock, Barrett & Babcock, Arvada, CO

* **Geology and Mineralization of the Paradise Peak Gold/Silver Deposit, Nye County, Nevada:** *R. N. Whittemore* and *R. E. Thomason,* FMC Corp., Reno, NV

The Paradise Peak deposit area is composed of Tertiary volcanic rocks of andesitic to rhyolitic composition emplaced as lava and pyroclastic flows. Silver and gold anomalies are associated with epithermal hot spring alteration. Higher precious metal values occur in silicified rhyolite tuffs surrounded by argillic alteration. Metallized rock crops out at the top of a low rounded hill which is approximately 2500' across at its base. The hill has about 275' of relief being surrounded by alluvium. The ore zone is approximately 1400 × 600' with thicknesses up to 400'. Drilling indicates a fairly shallow consistent southeast dipping ore zone. Mineable ore reserves were estimated at approximately 12 million tons ore grading 0.097 oz/T gold and 3.53 oz/T silver.

The Globe Hill Breccia-Hosted Gold Deposit, Cripple Creek District, Colorado: *A. D. Trippel,* Centennial, WY

The Globe Hill deposit is hosted by an alkali trachyte porphyry emplaced within the Oligocene-age Cripple Creek diatreme-intrusive complex. Four structural events occurred creating a series of crosscutting hydrothermal breccias and tectonic structures. Separate hydrothermal fluids passed through each of the four structural systems forming extensive, epithermal, low-grade, polymetallic mineralization along three of them. Brecciation and mineral precipitation may have developed when moderately-alkaline and -oxidized fluids boiled. The deposit may be the near-surface (hot-springs) expression of a deeper, high-grade vein system. Production at Globe Hill has yielded over 100,000 tr oz of gold. **86-38**

Geology of the Fortitude Gold-Silver Deposit, Copper Canyon, Lander County, Nevada: *P. R. Wotruba, R. G. Benson,* and *K. W. Schmidt,* Battle Mountain Gold Co., Battle Mountain, NV

The Fortitude gold-silver deposit is related to a "wallrock" copper porphyry system developed within middle-Pennsylvanian to Permian Antler Sequence sedimentary rocks adjacent to a mid-Tertiary altered granodiorite intrusive stock at Copper Canyon.

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ITEM 25

Gold-silver ores of the Fortitude deposit occur with disseminated and replacement-type sulfide mineralization within skarn-like or calc-silicated limy horizons of the Antler sequence contact meta-sedimentary rocks. A major north-trending, steeply westward dipping normal fault was important as a conduit for hydrothermal fluids responsible for metallization in the Fortitude area. Gold-silver mineralization is best developed near a marble front where retrograde chloritization and destruction of pro-grade calc-silicate mineral phases is most prevalent. Fluid-inclusion studies performed on the Copper Canyon system indicate a wide variation in fluid chemistry during several hydrosilicate stages ranging in temperature from 500°C to about 220°C. **86-46**

The Goldfield, Nevada, Exploration Model of Disseminated Epithermal Gold Deposits: *V. F. Hollister,* Mission, BC, Canada

Epithermal gold deposits occur in and near the marginal fault that circumscribes the Goldfield, Nevada, Tertiary caldera. The gold occurs disseminated in alunite, pyrite, and kaolin-bearing silicified zones that are controlled by the circular faults. Other Tertiary calderas (i.e., Summitville and Red Mountain No. 3) have epithermal disseminated gold deposits located in and near their marginal circular faults in settings that resemble the Goldfield example. These additional caldera-controlled epithermal gold deposits are also characterized by alunite, pyrite, and kaolin-bearing silicified rock that acts as hosts for the gold disseminations. The Goldfield District is therefore an exploration model for those seeking disseminated epithermal gold deposits in a caldera setting. **86-1**

Preliminary Report on the Geology and Gold Mineralization of the South Pass Greenstone Belt, Wind River Mountains, Wyoming: *W. D. Hausel,* Geological Survey of Wyoming, Laramie, WY

The South Pass greenstone belt is an Archean supracrustal pile formed of ultramafic to mafic metavolcanics with clastic, pelitic, and chemical metasediments that are folded into a "tight" synclinorium. Metamorphism is amphibolite grade with localized areas of greenschist facies. Both gold and taconite have been mined from the greenstone belt. Two mining districts — South Pass-Atlantic City and Lewiston host the principal auriferous shear zone deposits. The gold is found in quartz veins and iron-stained shears often with pyrite and arsenopyrite. Host rocks include metagreywacke, graphitic schist, metagabbro, and banded iron formation. **86-15**

The Pinos Altos Silver-Copper-Zinc Skarn Deposit, Grant County, New Mexico — A Progress Report: *C. Trepka-Bloch,* Boliden Minerals, Inc., Silver City, NM

Copper-zinc ores are confined to late paleozoic and cretaceous sediments composed predominantly of silty limestone, calcareous siltstone, and sandstone units. Mineralizations and alteration halos are spatially and presumably also genetically related to the emplacement of a cretaceous quartz monzonite stock. Several generations of ore formation and alteration took place. Distribution of skarn and ore was influenced by intrusive contacts, calcareous horizons, and by relatively less permeable rock units which served as barriers. Most of the ore bodies form conformable near horizontal pods or sheets but some follow steeply dipping monzonite dikes. The deposit is strongly affected by faulting and brecciation. **86-61**