only a 35-ft-thick equivalent of the Sundance. Particularly useful in correlation are purple and ocher analcime-rich rocks of the Popo Agie; the various units of the Redwater Shale Member and underlying member of the Sundance; and unconformities at the top of the Popo Agie, and at the base, in the middle, and near the top of the Sundance. The unconformity at the base of the Sundance is of Middle Jurassic age and is characterized by chert pebbles which occur in an area extending from the northeastern corner of Wyoming to Zuni, New Mexico (700 mi), and from the San Rafael Swell, Utah, to Boulder, Colorado (300 mi).

The Jelm extends from Wyoming about 50 mi into north-central Colorado. The Popo Agie and the lower and upper parts of the Nugget of central Wyoming correlate with the lower and upper parts of the Chinle, and with the Glen Canyon of the Uintas, respectively. The Gypsum Spring as defined at the type section is represented by the unconformity beneath the chert-pebble zone at Manila, Utah, on the north flank of the Uintas. The Sundance correlates with the Curtis and Entrada, and possibly with part of the Carmel of Manila, Utah.

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Exploration Progress in Alaska

(No abstract submitted)

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Geothermal Energy

The search and utilization of geothermal energy commenced in Italy in the early 1900s. Today, Italy produces sufficient power from geothermal energy to operate its entire network of electric railroads. This amounts to approximately 400,000 kw.

One hundred areas in 15 different countries are being explored for geothermal energy. Other countries which are currently utilizing geothermal energy are: Iceland, for domestic and industrial heating; Japan, for electrical power and recovery of salt from sea water; and New Zealand, U.S.A., and Mexico for electrical power.

The Geysers area of northern California was first investigated for its geothermal potential in 1922. The project was not successful as there was sufficient electrical power being produced from fossil fuel and by hydroelectric plants.

The rapid industrialization and population explosion in the western states have led to an increase in demand for energy. From 1945 to 1960, electrical power production increased 239% for the nation and 252% in the western states. The FPC predicts a 275% rise nationally by 1980, based on 1960 power demands, with a forecast of 320% rise for the western states. To meet these demands for electrical power, all forms of energy known to man must be harnessed.

The first commercial geothermal power production, in the United States, began at The Geysers in 1960 at the rate of 12,500 kw. In April 1967 the capacity was increased to 56,000 kw. It is estimated that the capacity can be increased to 1,000,000 kw.

Recognizing geothermal energy as a source of power, the U.S. Geological Survey is conducting a nation-wide investigation of all geothermal areas which may have this potential. The state Bureaus of Mines of California, Oregon, Nevada, Utah, and New Mexico have conducted their own studies to evaluate their geothermal areas.

Locating a geothermal area which may have commercial power potential is difficult. The most obvious areas of hot springs and geysers currently are being investigated. It is conceivable the areas which may hold the greatest potential cannot be detected at the surface.

The drilling and development of a geothermal area are extremely hazardous and expensive, but technical problems will be solved, and costs reduced, as future increased power demands escalates the exploration for geothermal power.

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Bituminous Sandstone Deposits of Utah

(No abstract submitted)

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Breaking Geological Communication Barriers

Although considerable attention has been given in recent months to geological obsolescence and scientific upgrading of the geologist, communication deficiencies pose a greater problem for geologists than does professional competency. These barriers result not only in unemployed geologists walking the streets, but also result in oil fields remaining prospects and geological talent going unrecognized. Though this may be near tragedy for the unemployed geologist or the hungry consultant who cannot sell his prospect, it also affects pay raises and promotions for the company geologist and the quality of students trained by professors.

Communication barriers arise with geologists for several inherent reasons. Geologists' training is largely scientific and, as rugged individuals, they tend to feel that their professional competence will carry their ideas. Being human, they blame: (1) management, who supposedly are too far from the problem to understand the geology; (2) investors or clients, who see only dollars and not the geology; or (3) other departments who cannot understand or be bothered with scientific geologic data. The average geologist does not make the effort to recognize the problem, study it, and attempt to correct it.

Geologists obviously exercise little control on clients, the public, other departments, or management. The solution must come from within the individual himself. The sales profession studies communication more than geologists do structure, stratigraphy, or oil finding. Their simple formula results in billions of dollars in profits and commissions:

1. Sell yourself—on what the proposition can do for you and your client;
2. Know your "stuff"—your product and your client;
3. Tell your story—get his attention; speak his language; show his gain; appeal to all five senses;
4. Prepare for all possible objections and have a ready explanation for each; and
5. "Clinch" the sale.

Geologists need not attempt "silver-tongued," high-pressure salesmanship, but a similar approach will improve geological communication at all levels. The following items are my approach to the problem: