press. Moreover, we have approached the economic limit of our conventional structural oil and gas finding methods, except for a few favored locales.

It is impossible to separate the discovery of oil and gas. Reasonable calculations indicate that 75 percent of all the 641 Tcf of natural gas discovered in the "Lower 48," whether nonassociated or associated-dissolved, has been discovered (not necessarily developed) incident to the search for oil.

All exploratory activity has declined drastically since 1955, until it is now less than at any time since the end of World War II. Since 1955, more and more effort and money have been diverted to foreign exploration and production. This resulted from ever-increasing domestic costs and a continuously deteriorating political climate for oil and gas activity. As the excess oil producing capacity in this country diminished, those countries with excess capacity were quick to take advantage of the situation. Declining discoveries of natural gas lie at the root of the energy crunch. Whether or not increased incentives to spur exploration and drilling, offered at the eleventh hour, will forestall shortages in the next 3 to 5 critical years is highly problematical.

The oil and gas industry has no reason to apologize or take the defensive. Studies by the Chase Manhattan Bank indicate that less than 4 percent of its "Group's" revenue comes from the sale of dry natural gas at the wellhead. Moreover, the independent operator, so important in discovering oil and gas in this country, is being forced out of the industry by adverse government regulation and political interference. The First City National Bank's studies of annual yield on stockholders' equity clearly refutes charges of both excessive earnings and monopoly. It would appear that a group of ultra-liberal congressmen and much of the press would rather see the consumer dependent on foreign sources of energy, which not only are far more expensive but also jeopardize our national security, than see a viable healthy domestic industry with adequate excess productive capacity to meet any emergency.

BERG, J. ROBERT, Wichita State Univ., Wichita, Kans.

HELIUM IN HUGOTON GAS FIELD

The chronologic development of the Hugoton field of Kansas, Oklahoma, and Texas, and the related Panhandle field of Texas has been reviewed as background for a study of the problems of origin, migration, and accumulation of the helium, nitrogen, and natural gas in these areas. Within the past decade, the release and publication of analyses from the Hugoton field and other areas have been commonplace. In addition, in-depth studies concerning helium, resulting from the past few years of litigation, have provided abundant data on the occurrence of helium, which may shed light on, and give impetus to the study of problems of origin, migration, and accumulation in general.

BRADFORD, WILLIAM E., Magcobar Well Logging and D.A.T.A. Control, Oklahoma City, Okla.

DEEP DRILLING TECHNOLOGY

The involvement of the geologist in the total planning of deep exploration wells and the reduction of total well cost is advocated. The planning stage utilizes all available wire line logs for pressure plots and the correlation of lithology for optimized programs. The drilling stage utilizes drilling variable plots for pore pressure and rupture-pressure determination. All geologic, mechanical, and hydraulic components are monitored closely for maximum penetration, evaluation, and safety. A final evaluation and data storage method is recommended.

CARVER, HERSHEL, Jake L. Hamon, Amarillo, Tex.

MATHERS RANCH

The Mathers Ranch field in Hemphill County, Texas, represents another major discovery of gas reserves from the Siluro–Devonian Hunton limestone in the Anadarko basin of Oklahoma and Texas. It is the seventh significant Hunton field discovered in the deep Anadarko basin and is the result of continued exploratory drilling for Hunton and deeper objectives in the Cambro–Ordovician. Mathers Ranch field has more than 10 wells completed and the field limits are not yet defined in any direction. The discovery lies on a south–plunging structural nose transected by east–west faulting which, coupled with north dip, contributes structural entrapment. The degree to which porosity development is important as an entrapment agent is not yet defined and may be as important as structure, or even more so when the field is outlined completely by drilling. Production comes from below 17,000 ft from both intergranular and fracture porosity.

CLARKE, DONALD S., Tilco, Inc., Denver, Colo.

OIL AND GAS FUNDS—THEIR FUTURE IN FINANCIAL PLANNING

(No abstract submitted)

DAVIS, HERBERT, Davis, Northcutt and Cochrane, Oklahoma City, Okla.

MORROW-SPRINGER TREND, ANADARKO BASIN, TARGET FOR THE 70'S

The Morrow Formation has accounted for much of the gas reserves on the shelf area and a limited part of the deep area in the Anadarko basin from 1947 to 1970.

The Morrow-Springer Formations offer multiple stratigraphic targets in this vast sedimentary basin. Deep drilling during the 70's could account for additional gas reserves from the Morrow-Springer.

As the stratigraphy, sedimentation, and depositional patterns are revealed through drilling, additional fields similar to Buffalo Wallow upper Morrow gas field, Hemphill County, Texas; East Elk City Springer gas field, Beckham County, Oklahoma; Indianapolis Springer gas field, Custer County, Oklahoma; and Laverty Springer gas field, Grady County, Oklahoma, will account for much of this reserve.

GRAFF, TOM, Amarex, Inc., Oklahoma City, Okla.

GEOLOGY, PETROLOGY, AND RESERVOIR CHARACTERISTICS OF MARCHAND SANDSTONE IN GRADY AND CADDO COUNTIES, OKLAHOMA

Marchand sandstone (Pennsylvanian-Missourian) oil production was discovered in 1967 at NE Verden, T8N, R8W, Grady County, Oklahoma. The play developed slowly but discoveries since 1970 by Samedan Oil Co. at Dutton townsite, Apache Corp. at NW Chickasha, and Midwest Oil Co. and Eason Oil Co. at NW Norge led to the most concentrated drilling boom in Oklahoma's Anadarko basin in recent years.

The fields are on the east flank of the east end of