

## LUNCHEON MEETING—NOVEMBER 24, 1986

### PATRICK T. GORDON—Biographical Sketch



Pat Gordon received a Bachelor's Degree in Geology from Texas A&M University in 1966 and a Master's Degree in Geology from A&M in 1968. He spent the next two years as a Lieutenant in the U.S. Army doing quantitative landform analyses in Massachusetts, and terrain intelligence estimates in Vietnam.

In 1970, Mr. Gordon joined Gulf Oil Corporation as a geologist in Houston, exploring for oil and gas

along the Upper Texas Gulf Coast. In 1975, he became Senior Geologist in charge of exploration in Federal and State Waters, Offshore Texas. He was promoted to Regional Geologist in 1976, supervising exploration in the Tertiary trends, both onshore and offshore Texas. In 1979, he became a Senior Regional Geologist with Gulf in Midland, Texas where he supervised exploration activities in Southeast New Mexico, and the hingeline area of Southwest New Mexico, Arizona, and Southwest Utah.

Since 1982, he has been a Senior Staff Geologist with Michel T. Halbouty Energy Company, exploring for oil and gas in the Texas Gulf Coast and the Permian Basin.

#### OVERVIEW OF "TYPICAL OIL AND GAS FIELDS OF SOUTHEAST TEXAS, VOL. II" WITH EMPHASIS ON THE DEEP FRIO/VICKSBURG TRENDS

In the new book to be published by the Houston Geological Society this spring, there are 91 fields scattered among 20 counties in parts of RRC Districts 2, 3, and 5, including offshore State and Federal waters. They range in size from giants such as Thompsons Field (350 MM Bbl of oil) in Fort Bend County to small ones such as Renee Field (8 BCF of gas) in Harris County. The oldest producing formation is the Jurassic Cotton Valley, the youngest is Miocene. However, almost half of the fields discussed are producing from the Oligocene Frio and Vicksburg formations. Some are older fields discovered in the 1950's and 1960's, but many are more recent discoveries from the 1970's and 1980's.

Typical of the newest discoveries are the significant upper Frio, lower Frio, and Vicksburg fields found in Chambers, Galveston, and Harris Counties. All have major similarities: 1) They are located downthrown to large regional growth (flexure) faults which expand the producing horizons and overlying shale sections by 200% to 500%, or more; 2) The producing sand intervals and adjacent shales are overpressured (15-17 ppg mud) and found at great depths (10,000-15,000 feet); 3) Producing sections are overlain by thick marine shales (500-2,000 feet) which were deposited in middle to outer neritic environments; 4) Pay sands are interpreted as delta distributary mouth bar sands which were fed by updip channels.

The upper Vicksburg Loxostoma "B" expansion fault extends from southern Orange County to southern Harris County. The producing trend has one major sand which varies in thickness from 0 to 275 feet, but typically averages 25 to 50

feet. Devillier field in Chambers County has produced over 30 BCF of gas from a Lox. "B" sand in a combination structural and stratigraphic trap at a depth of 10,500-10,700 feet.

The Basal Frio expansion fault lies sub-parallel to, and from one to five miles south of, the Lox. "B" fault. It extends from central Jefferson County to north central Brazoria County. The Basal Frio trend has, at various times, been referred to as the Text. "2", the Text. tumidula, the transitional Vicksburg, and the Text. warreni trend. Wells in the producing trend have from one to five sands, each of which varies in thickness from 0 to 50 feet. Ellwood field in Chambers County has produced over 50 BCF of gas from a basal Frio sand on a structural closure at a depth of 12,700-13,100 feet. Southeast Hastings field in Galveston County has produced over 50 BCF of gas and 3 MM Bbl. of oil from multiple basal Frio sands on a fault closure at a depth of 9,200-10,500 feet.

The upper Frio expansion fault extends from southeastern Chambers County to southeastern Brazoria County and lies sub-parallel to, and three to five miles north of, the present shoreline. The producing trend has one major sand which varies in thickness from 0 to 200 feet, but typically averages 25 to 100 feet. Point Bolivar North Field in Galveston County has produced over 300 BCF of gas from a 100-foot thick upper Frio sand on a faulted anticline at a depth of 12,200-13,000 feet.

These significant Frio and Vicksburg fields were discovered during the increased exploration levels of the 1970's. Numerous smaller, but in many cases significant, fields have been discovered along these trends in the 1970's and early 1980's. Minor production has also been established in the last few years on the downthrown side of the lower Vicksburg Uvigerina "K" trend. Although the Frio/Vicksburg trend has been considered a mature producing province, it is predicted that significant major new gas reserves will be found in the deep, downdip overpressured Frio and Vicksburg expanded trends in the future.