INTERNATIONAL EXPLORATIONISTS GROUP EVENING MEETING—NOVEMBER 16, 1983

P. G. SCORCELLETTI—Biographical Sketch

Giorgio Scorcelletti has been an International Geologist with Gulf Oil since 1954 and for the past six years has been assigned to Gulf's Exploration and Production International Headquarters in Houston where he is involved in the company's African operations. He received his Doctor of Geological Sciences degree from the University of Pisa in Tuscany, Italy, in 1954 and began working for Gulf in Sicily. In 1958 he was transferred to Africa where he spent the next 20 years in various assignments in Libya, Mozambique, Eritrea, Angola and Gabon.

Among Giorgio's contributions to Gulf's oil and gas discoveries in these countries are the use of surface expressions for locating otherwise undetectable subsurface faults in Libya, photogeologic interpretations to indicate subsurface anomalies in Mozambique, postulation of the occurrence of Upper Cretaceous carbonate facies offshore Cabinda in Angola, and pre-salt stratigraphic studies in Gabon. His work in Mozambique resulted in the presentation of his theories on the detection of subsurface anomalies through photogeological methods at the first industry convention organized by the Portuguese government in 1965. He has written articles on Mozambique for the Petroleum Encyclopedia edited by ENI, and in 1977 and 1978 compiled and wrote the "Petroleum Developments in Central and Southern Africa" section for the AAPG bulletin.

Giorgio is a member of the Houston Geological Society, the American Association of Petroleum Geologists, and the Ordine Nazionale dei Geologi.

MOZAMBIQUE: THE SEARCH FOR THE SUBTLE TRAP

After 35 years of exploration and the drilling of 61 wells (12 offshore), only three discoveries have been made in Mozambique. These discoveries are the onshore gas fields found by Gulf: Pande-1, Buzi and Temane. Reserves for these fields range from 500 BCFG to 1.4 TCFG.

Pande-1 was discovered in 1961 based on geophysical studies. The entire area is covered by forest and recent sediments which add to the complication of a structural interpretation. The second gas discovery, Buzi-1, was made in 1962. At this stage, an attempt was made to determine whether photogeology could afford a clue to subsurface exploration. A study of the Buzi surface area revealed a photogeologic anomaly covering the seismically indicated subsurface structure. The same coincidence of surface and subsurface structure appeared to be true for the existing Pande Field when the study was extended to that area. With these encouraging results in hand, the surface study was extended to cover the entire concession area. The final assembly of data indicated not only major fracture trends related to the East Africa rift system but also a number of additional structural anomalies. An intensive three-year drilling program based on this photogeological study combined with seismic information resulted in the discovery of only two additional gas accumulations (the Temane-2 and Pande-5 structures), although approximately 50% of the wells had shows.

The question then arose, "Why so many dry structures?"

A reconstruction of the structural evolution of the known fields indicates a possible answer. The discovered gas fields were composed of traps with both structural and stratigraphic components which had been present since Maestrichtian time. Structural growth may have continued throughout the Paleocene. At the end of Paleocene time, the entire coastal belt began tilting to the east as a result of the drifting apart of Madagascar from Mozambique. This tectonic event altered the equilibrium of subsurface fluids and a regional migration of hydrocarbons was set in motion. During the Eocene and Oligocene, prograding, foreset beds began to be deposited progressively from west to east. These were the so-called "seismic inclined beds" discovered in the Buzi area and dated by paleo as Eocene to Oligocene in age. Additional tilting occurred during the Miocene. Only those structures having a stratigraphic seal updip, that is, the "subtle traps", had a good chance of retaining the hydrocarbons received early in the migration phase.