

INTERNATIONAL EXPLORATIONISTS GROUP EVENING MEETING - APRIL 16, 1986

MICHAEL E. SCRUTTON—Biographical Sketch



Mike Scrutton is Director, North and South America, for Robertson Research. He gained a B.Sc. (Hons.) degree in geology at the University of Bristol, England, in 1966, and continued with post-graduate research leading to a Ph.D. in 1969. His Ph.D. thesis was concerned with the foraminiferal ecology and deltaic sedimentology of the Ebro Delta, Spain.

He joined Robertson Research in 1969, initially as a paleontologist. After a brief

period in North Wales, he was assigned to Singapore from 1970 to 1975 where he advanced to Deputy Manager. In 1975 he was transferred to Jakarta to establish Robertson's operations in Indonesia. In 1977-78 he returned to Singapore as Acting Manager. In the 1970-78 period, Dr. Scrutton pursued various research interests leading to the publication of some papers dealing particularly with carbonate depositional models in Indonesia.

In 1978, Dr. Scrutton set up Robertson Research's office and laboratories in the U.S.A. As President of Robertson Research (U.S.) Inc. he has directed operations and business development in the USA and South America.

Mike Scrutton is a member of AAPG and a Fellow of the Geological Society of London.

PETROLEUM GEOLOGY OF THE SEDIMENTARY BASINS OF COLOMBIA

Petroleum exploration in Colombia has gained momentum over the last two years as a result of the successful Association Contract system and the stimulus provided by the discovery of the 1.4 billion barrel Cano Limon field.

Eleven principal sedimentary basins or basin complexes are recognized in Colombia. Their configuration is to a large extent controlled by a number of significant tectonic units which have an approximate north-south to north-northeast-south-southwest alignment.

The dominant tectonic feature is the great Andean mountain chain running through central Colombia which is comprised of three major trends, the Eastern, Central and Western Cordilleras, formed during the Tertiary Andean orogeny. Between the Eastern and Central Cordilleras is the Magdalena depression which encompasses the Upper and Middle Magdalena depression which encompasses the Upper and Middle Magdalena Basins, with a wrench fault offset continuing north into the Cesar Valley (Cesar-Rancheria Basin). The Magdalena depression was originally an intra-continental early Mesozoic rift partially filled with continental red beds with local marine sediments and evaporites of Triassic age, followed by Jurassic volcanoclastics and continental sediments, and later by Cretaceous and Tertiary deposits. The Magdalena Valley assumed its present "half graben" configuration as the Central Cordillera fault system.

Between the Central and Western Cordilleras lies the narrow Cauca-Patia Valley where Upper Eocene and younger Tertiary sediments overlie thick Cretaceous eugeosynclinal sediments with angular unconformity. West of the Western Cordillera is the Pacific Coastal (Choco-Pacific) Basin, containing Tertiary sediments deposited as a littoral wedge to the Cordillera. The northern part (Atrato sub-basin) contains up to 30,000 feet of sediments and merges south into the wide homocline of the coastal plain and immediate offshore area.

In the central and eastern part of Colombia are the Subandean foreland basins, the Putumayo and Llanos, separated by the Vaupes Swell and Serrania de la Macarena. Both basins are characterized by a westward thickening wedge of Cretaceous and Tertiary sediments. In the Llanos Basin these overlie Paleozoic rocks. In the extreme southeast of the Colombia lies the little-known Amazonas area, an intracratonic basin containing a Cambro-Ordovician sequence overlain by Tertiary sediments.

Northwest of the continuation of the Eastern Cordillera into Venezuela as the Merida Andes, and separated from the Middle Magdalena Basin by the Santander Massif, lies the Catatumbo Basin. It is the southwestern limit of a northeasterly plunging lobe of the prolific Maracaibo Basin, filled with Cretaceous and Tertiary sediments.

The Guajira "Basin" on the northern Caribbean coast, is more accurately defined as a series of four basins in the Guajira Peninsula filled with Tertiary marine sediments. The area is tectonically divided by two major east-west strike-slip faults, the Cuiza and Oca faults. The Lower Magdalena Valley area comprises a series of sub-basins infilled with Tertiary marine sediments and including the Sinu-Atlantico coastal basins to the west of the Romeral fault system.

Hydrocarbon production is well established in the Llanos, Lower Magdalena, Middle Magdalena, Upper Magdalena, Catatumbo, Putumayo, and Guajira Basins. One of the most significant features of the petroleum geology of Colombia is the accumulation of rich Cretaceous oil source rocks, particularly in the area between the Central Cordillera and the shield to the east. They were deeply buried and matured and, later, as multiple phases of orogenesis created structural and stratigraphic traps, effective pathways for migration from source to reservoir were established.

Substantial reserves probably remain to be discovered in the Llanos, Middle and Upper Magdalena basins. Some further potential may exist in the Putumayo, Cesar-Rancheria, Catatumbo and Lower Magdalena Basins, but the latter is probably largely gas-prone. The remaining basins (Choco-Pacific, Cauca-Patia, Bogota, Los Cayos, Guajira, Amazonas) are not entirely lacking in potential but they are under-explored and must be viewed as unlikely to contain important reserves given the present state of geological knowledge and petroleum economics.