
INTERNATIONAL EXPLORATIONISTS

INTERNATIONAL EXPLORATIONISTS DINNER MEETING—SEPTEMBER 20, 1989 STEVEN SCHAMEL—Biographical Sketch

Dr. Steve Schamel is currently Associate Director and Research Professor of geology at the Earth Sciences and Resources Institute (ESRI) at the University of South Carolina in Columbia, South Carolina. He holds a B.A. in geology from Franklin and Marshall College and a M.A. and Ph.D. in geology from Yale University.

Before joining ESRI as a full-time staff member in 1980, Dr. Schamel served as Scientific Director of the ESRI Tunisian Geologic Project. He has held teaching posts at Lafayette College, Florida State University and Yale University. In addition, he has worked for the USGS and has been a Visiting Research Associate at the Lamont-Doherty Geological Observatory. He presently is serving on the Editorial Board of *Geology*. He has consulted for the Nuclear Regulatory Commission, the Florida Department of Environmental Regulation, the Baker Chemical Company and other organizations.

During graduate work at Yale, Dr. Schamel did research on the early structural development of the Northern Apennines under the direction of John Rodgers. He was a Fulbright Scholar at universities in the Federal Republic of Germany and the College de France in Paris. He speaks German, Italian, French and Spanish.

Ongoing research interests include: international hydrocarbon exploration, the interaction of structure and sedimentation in extensional basins, the development of North Africa-Southern Europe-Tethys, tectonics of the Northern Andes, and microcomputer applications in geology.

HYDROCARBON HABITATS OF THE UPPER AND MIDDLE MAGDALENA VALLEYS OF COLOMBIA

The Magdalena River flows northward across the Colombian Andes, traversing a series of en echelon, sediment-filled structural depressions called the Magdalena basins. These basins resist easy classification in that until the late Miocene they have been parts of much more extensive basins: an extensional, backarc basin during the Triassic-Jurassic; a pericratonic trough during the Cretaceous and early Tertiary; the inner margin of a broad, east-facing foreland trough during the mid-Tertiary; and more

recently an array of intermontaine or "successor" basins. The geologic character of the Magdalena basins is tied intimately to that of the bordering Central and Eastern Cordilleras. Since 1918, there has been nearly continuous exploration activity in the Magdalena basins resulting in the discovery of more than 2.6 billion barrels of oil and 2.7 trillion cubic feet of gas, more than half of the total oil and about a third of the total gas reserves of the country. As of the end of 1988, the daily production from the basins averaged 142,484 barrels of oil and 165.9 mcf of gas.

The abundant hydrocarbon resources of the Magdalena basins are based on the presence of a thick, organic-rich limestone and shale succession (La Luna or Villeta) deposited in an extensive pericratonic trough along the northwest margin of the Guyana Shield during the Cretaceous. In the south, nearer the paleogeographic margin of the trough, shallow marine sands (Caballos and Monserrate) bounding the Cretaceous marine megacycle are the prime reservoirs. To the north, nearer the axis of the trough, Cretaceous sand reservoirs are absent and production is almost exclusively from mid-Tertiary molasse deposits. The Magdalena basins contain a wide variety of structural and stratigraphic traps, most developed during or prior to peak of maturation of the Cretaceous source beds. Recent discoveries of giant oil accumulations, such as the San Francisco field, were made in large, hanging-wall anticlines previously considered breached and unproductive. The testing of deeper reservoirs and new structural concepts during the 1980's has resulted in many important discoveries. From the standpoint of hydrocarbon exploration and exploitation, the Magdalena basins are not yet "mature". The potential for additional major discoveries is excellent and it is certain that with improved production techniques current estimates of remaining ultimately recoverable reserves in the producing fields will be revised upward.