

INTERNATIONAL EXPLORATIONISTS GROUP EVENING MEETING—APRIL 18, 1984

WILLIAM F. BISHOP—Biographical Sketch



William F. Bishop is Regional Exploration Coordinator for the International Division of Tenneco Oil Company. Bill graduated *cum laude* and Phi Beta Kappa from Miami University (Oxford, Ohio) in 1954 with an A.B. degree in geology, and he received his M.A. in geology from the same university in 1957 after two years of service with the U.S. Army Corps of Engineers in the U.S. and Germany. He did additional

studies at Harvard Business School and Centenary College. After completing his Master's degree, Bill went to work for Marathon Oil Company in Shreveport where he did regional stratigraphic studies in North Louisiana and South Arkansas. In 1963 he joined Tenneco Oil Company in Shreveport doing subsurface studies in the Smackover, economic evaluations, and delineation of hydrocarbon prospects. In 1967 he was transferred to Calgary where his responsibilities were in developing prospects in Jurassic, Mississippian, and Devonian carbonates and sandstones. In 1969 Bill was transferred to Tenneco's international group in Houston where he was involved in basin evaluation and hydrocarbon potential assessment of various areas in Africa and the Middle East. During this time he also served as a consultant to the Gulf Coast division on Smackover exploration.

In 1972, Bill left Tenneco to join Weaver Oil and Gas to explore the Central Appalachian Basin, and a year later became an International Exploration Advisor with Ashland Exploration where he was responsible for exploration programs, stratigraphic and structural investigations and detailed carbonate studies in Indonesia, Mexico, Guatemala, Belize, and other areas in the Far East and Latin America. In 1977, Bill rejoined Tenneco's International Division where he continues to coordinate exploration programs and conduct geological investigations in Africa and the Middle East. Tunisia is one of Bill's prime areas of responsibility.

Bill has published a number of technical papers and articles in the AAPG bulletins, GCAGS transactions, the Oil and Gas Journal, and the Journal of Petroleum Geology. These papers have covered such diverse subjects as the Smackover and pre-Smackover formations, Haynesville and North Haynesville fields, Red Rock Field, and Jurassic contemporaneous faulting in the Gulf Coast area, as well as the geology of Tunisia, Algeria, Libya, Indonesia, and Central America.

Bill is well known in the Houston area through his activities in the Houston Geological Society where he served as President in 1981-82. Prior to that he was 1st and 2nd Vice Presidents and active on other committees within the Society. He continues his contributions to his profession through activities in such HGS groups as the International Explorationists. In addition to the Houston Geological Society, Bill is a member of the American Association of Petroleum Geologists (where he was a member of the House of Delegates), the Society of Economic Paleontologists and

Mineralogists, and the Southeast Asia Petroleum Exploration Society.

PETROLEUM GEOLOGY OF EAST CENTRAL TUNISIA

The tectonics of Tunisia are extremely complex and include folds, all types of faults, salt diapirs, and the major Saharan flexure which separates a stable Paleozoic province on the south from a subsident zone of Mesozoic and Cenozoic strata represented by the offshore Ashtart and Tripolitania basins. The remainder of the offshore is mostly stable shelf of the Pelagian craton, and the study area is situated on this platform, the onshore part of which is known as the Sahel. This region is poorly understood because of the Neogene-Recent sedimentary cover, but subsurface data indicate it to be structurally complex.

To date, two carbonate zones are proven hydrocarbon reservoirs in the study area: the earliest Eocene (Ypresian) Metlaoui and the Zebbag of Late Cretaceous (Turonian) age. With the exception of a few sandstones in the Oligocene and Miocene, the section above the Metlaoui is limestone and shale. The section below the Zebbag is dolomite, limestone and shale down to the oldest penetration, the probable top of the Jurassic. In addition to complex faulting, the section of interest is complicated by unconformities at the base of the Santonian and at the top of the Cretaceous.

Regionally, the Zebbag is thin or absent on the high side of the Saharan flexure and crops out west of the folds and faults of the N-S axis, which separates the Tunisian Atlas from the Sahel. There is apparent regional truncation on the northeast and local absence, possibly resulting from salt intrusion, on the south. On the north and east are a basinal facies of shale and micrite with planktonic forams and a slope or transitional facies of micrite and wackestone, commonly argillaceous with occasional attributes of shallow water, such as dolomitization, bioclasts, rare oolites, etc. On the shelf are bioclastic wackestones and packstones which tested oil in two wells. Oolite grainstones above the main porosity were productive in one well and tested oil in another. The bioclastic facies appears to be fairly restricted and may not be a continuous shelf-edge deposit. A lagoonal evaporite facies appears to be present on the west, and thin dolomites and anhydrites are common in the cored well in the study area.

Regionally, the well defined facies belts of the Metlaoui trend NW-SE. On the northeast is an open marine, basinal facies of micrite and marl with abundant planktonic forams (Bou Dabbous). Nummulithoclastic packstone crops out west of the N-S axis (as do all other facies) and is thickly developed in the study area; it may fringe the entire nummulite facies on the seaward side. Thick bars of nummulite wackestone/packstone/grainstone, deposited in shallow water, trend northeastward at an angle to the paleoshelf. This lithology has primary porosity, tested oil in two wells, and is a commercial reservoir at the small Sidi El Itayem field and the very large Ashtart field. A bioclastic wackestone with nummulite debris is well developed in some wells and may be present elsewhere. Lagoonal gastropod coquina is present in one well and common in outcrops. Lagoonal/supratidal mudstone/wackestone and dolomite are widespread between shelf deposits and the thick gypsum and anhydrite which crop out in intermontane basins and probably are present in the subsurface.

Analyses of a considerable number of surface and subsurface samples have identified to date two source rocks, Bahoul (basal Turonian) and Bou Dabbous (Ypresian). The oil in the Metlaoui of one well correlates very well with the

Bahloul using fluorescence scan data and is a good match with ^{13}C isotopes. The oils of Ashtart and Sidi El Itayem fields are indicated by geological considerations and published data to have been generated from the Bou Dabbous. The Metlaoui oil in another well appears to be a less mature version of these two oils.

Oils from Turonian reservoirs clearly are of the same family as indicated by fluorescence scan, ^{13}C isotopes, pristane/phytane ratio, carbon preference index, and API gravity. Their origin is uncertain, but an intra-Turonian source is suspected because of the close correlation among the oils and their occurrence only in reservoirs of that age.