

## EVENING MEETING—MAY 8, 1978

### LEO HORVITZ—Biographical Sketch



Leo Horvitz acquired his preliminary training in chemistry at Brown University in Rhode Island, his native state. At Brown, he received BS and MS degrees and then went on to the University of Chicago, where he earned his doctorate, also in chemistry.

In 1936, Dr. Horvitz came to Houston to work with E. E. Rosaire, a pioneer in geophysical exploration who had become interested in the then new

field of geochemical prospecting. Except for a brief period during 1942-1943, when he returned to the University of Chicago to serve as a group leader on a war research project, he has devoted his entire professional career to the development and application of geochemical exploration methods. His special interest is correlating the light, saturated hydrocarbons that occur in near-surface soils and sediments with subsurface oil and gas accumulations.

Dr. Horvitz is now president of his own organization, Horvitz Research Laboratories, Inc., where he continues his work in geochemistry. Among the scientific societies to which he belongs, are AAPG, SEG, HGS, the Geochemical Society and the American Chemical Society.

### NEAR-SURFACE EVIDENCE OF HYDROCARBON MOVEMENT FROM DEPTH (Abstract)

Tens of thousands of near-surface sediment samples, taken from both onshore and offshore areas, have been analyzed for the light, saturated hydrocarbons, methane through pentane. Many of the samples were collected over gas and oil fields, but most were gathered in unproven areas. Recognizable hydrocarbon-distribution patterns were observed over known fields, and similar patterns were also found in the unproven areas. A high percentage of the anomalies that developed in the latter areas have subsequently been found to be associated with petroleum deposits.

One of the land surveys includes the Flomaton-Jay-Blackfoot Creek area. It was conducted shortly after the Jay discovery, but before the Blackfoot Creek field was known. Hydrocarbon-distribution patterns reflected Flomaton and Jay production and indicated Blackfoot Creek as prospective. A hydrocarbon survey conducted offshore Louisiana prior to the March 1974 Gulf of Mexico sale produced a hydrocarbon anomaly which now contains the discovery well of the Cognac field.

The mechanism by which the lighter hydrocarbons move from a deposit to the surface is not yet clear, but the phenomenon has been validated by evidence beyond that provided by empirical data of near-surface surveys. Carbon-isotope data are part of this evidence. Methane, desorbed from a soil sample taken at 12-ft depth from an anomalous area observed over the Francitas field in Texas, yielded a  $\delta C^{13}\text{‰}$  value of -44.0 relative to the PDB

standard. Interstitial methane extracted from a 12-ft sample taken at another location within the same hydrocarbon halo yielded a value of -40.8. Reservoir methane from the Francitas field showed  $\delta C^{13}\text{‰}$  values ranging from -41.0 to -43.8, almost identical to those of the near-surface methane.

Additional evidence of upward movement of hydrocarbons from petroleum accumulations is supplied by analyses of well cuttings. Hydrocarbon buildups observed in cuttings logs of test wells have anticipated oil and gas accumulations. Such a log was responsible for the discovery of the East Bernard field in Texas.