## NOON MEETING—MAY 20, 1981

### PHILLIP T. FOWLER—Biographical Sketch

Phillip Fowler received a PhD degree in structural geology from Harvard University. From 1950 until 1962, he worked for Shell Oil Company as geologist, district geologist, and division exploration manager in Corpus Christi, San Antonio, and Tyler. A 5-year period of negative cash flow as a consultant in the ArkLATex area was followed by 2 years in Dallas doing gravimetric interpretation with E.S.I. and 2 years in Algiers doing basin studies with SONATRACH. Returning to Houston in 1971, he did exploration geology in the Gulf Coast and Appalachians. Since 1975, he has been on the staff of Texasgulf Oil and Gas Company working on exploration projects in Alaska, the North Atlantic offshore, the Midcontinent, and the Rocky Mountains.

### WHY ARE FIELDS AND UPLIFTS WARM? (Abstract)

Steady-state irregularities in temperature gradient, denoting discontinuities in heat flow, are the rule in the oil patch because fluids from thermally dehydrating montmorillonites are moving from source rocks to fill new porosity created by dilatant microfracturing where consolidated strata are bending elastically. These fluids conserve internal heat as they migrate. Therefore, as the fluids collect in reservoirs, geothermal flux focuses beneath the shallow hot spots, and the resulting deep hot spots become sites of expansive sub-crustal solid-phase transitions—hence crustal uplifts.

The fact that fluids in Paleozoic fields are still rising and still hot shows that the lithosphere is perpetually coupled dynamically to the mantle directly beneath it, the flux of heat from the passive mantle being amplified or quenched by feedback from changing temperature-gradient signals in basins of the active crust. It follows that both the tectonic behavior of a sedimentary province and the size of its petroleum reserves are determined by the distribution of volcanogenic clays.