LUNCHEON MEETING—JANUARY 26, 1983

ANITA G. HARRIS—Biographical Sketch

Anita has the additional distinction of being the first person to have her picture lost at press time by the editor.

Anita Harris is a geologist with the Paleontology & Stratigraphy Branch of the U.S. Geological Survey at the Smithsonian in Washington, D.C. She received her BS from Brooklyn College and PhD from Ohio State University. She worked for the USGS intermittently from 1957 to 1967 as a field assistant, geophysicist, and geologist. From 1967 to 1974 she was geologic map editor for the Survey after which she obtained her present position as a conodont specialist. In the course of her career she has authored and co-authored over 50 papers and maps on stratigraphy, structural geology, hydrocarbon evaluation, and conodont biostratigraphy of Paleozoic and Triassic rocks covering many areas of the United States. She has been chief of several biostratigraphic projects spanning the country, but most of her individual work has focused on establishing and refining the conodont biostratigraphic framework and paleoecologic models for Ordovician through Devonian rocks in the Appalachian and Great Basins. In addition, she has established conodonts as reliable indices of thermal metamorphism and applied this technique to the analysis and interpretation of several large regions in order to assess hydrocarbon and mineralization potential and to interpret tectonic evolution. Her work has received recognition from industry, academia, and foreign and domestic governments; last year she received the Department of Interior's Meritorious Service Award for her achievements. She has recently received some notoriety from her consulting work with John McPhee involving several articles in the "New Yorker" magazine. These pieces concern various aspects and controversies of geology and the geology of the Appalachians.

CONODONTS FOR HYDROCARBON EXPLORATION STRATEGIES—THE LITTLE CONODONT THAT COULD

Conodonts are bright, shiny, colorful, apatitic microfossils that are common to abundant in marine rocks of Cambrian through Triassic age throughout the world. In the last decade they have become one of the major biostratigraphic and organic maturation indices throughout most of their geologic range. As a consequence, conodonts now have great utility in the search for oil and gas and mineral deposits in Paleozoic and Triassic rocks. The use of conodonts as metamorphic, paleogeographic, and chronologic indices facilitates interpretation of pre-thrust depositional and burial metamorphic patterns, suggests relative sequence and correlation of thrust sheets, and indicates areas favorable for hydrocarbon exploration. Recent and ongoing published and unpublished studies in the Appalachian Basin, Michigan Basin, central Great Basin, and Arizona provide examples of all these applications in a wide range of geologic settings.

Conodont-based isograd maps for some or all Ordovician through Triassic Systems are now or will soon be available for the Appalachian Basin, Arizona, and the central Great Basin including Nevada, Utah, southeast Idaho, and eastern California. Each of these large terranes with its distinct depositional, thermal, and tectonic history as well as widely dissimilar geologic and conodont data base require different interpretation strategies to assess oil and gas as well as some types of mineralization potential. Conodont-based isograd maps provide a first-cut assessment and target large areas of resource potential in such frontiers as the buried segment of the Valley and Ridge Province beneath the crystalline terrane of the eastern Appalachians, the southern Western Overthrust Belt, and the central Great Basin.

Refinement of conodont zonations has enabled revision and reinterpretation of Ordovician stratigraphy and paleogeography in the Appalachian and Michigan basins. In part of the Appalachian Basin and adjacent craton, the well-documented disconformity between Lower Ordovician dolostones and Middle Ordovician limestones is usually associated with karstification features and porosity horizons. These porosity horizons are often the host or reservoir rocks for stratabound mineral deposits or large volumes of natural gas. Conodont studies now show that in the central Appalachian Basin, 1) a large part of the dolostone sequence is of Middle Ordovician age, 2) nearly continuous deposition occurred across the Lower/Middle Ordovician boundary in a large area centered at the Mason-Dixon Line, and 3) karstification and associated porosity horizons do occur at several levels in this carbonate sequence, but considerably below the dolostone-limestone contact previously taken as the basinwide marker for an unconformity of considerable magnitude. In the Michigan Basin, conodonts from a deep well near the Paleozoic depocenter of the basin prove that over 2300 feet of evaporite-bearing sandy carbonates are of Early through Middle Ordovician age and not Late Cambrian age as widely held. This revision considerably alters the interpretation of basin configuration, paleogeography, and tectonic development.