

**INTERNATIONAL EXPLORATIONISTS  
GROUP EVENING MEETING—  
FEBRUARY 18, 1987**

**KEVIN BURKE—Biographical Sketch**



Kevin Burke is the Director of the Lunar and Planetary Institute in Houston and has been a Professor of Geology at the University of Houston since 1983.

Kevin was born in London England and educated at the University of London, receiving his Ph.D. in geology in 1953. He first taught at the University of Ghana (1953-1956) and then worked at the Geological Survey of

Great Britain (1956-1961). Kevin took part in establishing a geology department at the University of the West Indies in Jamaica where his research related mainly to comparisons of ancient and active sedimentation (1961-1965). Between 1965 and 1971, he was Professor of Geology at the University of Ibadan in Nigeria, where as a result of studying the Benue trough, he became interested in the application of the concepts of Plate Tectonics to the interpretation of the geological record, particularly rifting. As a visiting professor at the University of Toronto, Kevin developed these interests while working with J. Tuzo Wilson.

From 1973 to 1983, Kevin was Professor of Geology at the State University of New York in Albany and pursued global studies in tectonics. He has published over 100 papers in geology and has worked frequently as a consultant on regional geology and tectonics.

**EVOLUTION OF THE SOUTH-EASTERN  
CORNER OF THE CARIBBEAN DURING  
THE LAST 25 MILLION YEARS**

Fission track studies of zircons from Barbados indicate that (although no faunas younger than Eocene in age have been recognized in the Scotland district rocks) all units now structurally below the "Oceanic Formation" were resedimented in Late Oligocene to Early Miocene times (30-20 Ma.) We have used this observation, together with results from our field-work in Trinidad and our interpretation of 5,000 km of seismic line off the north coast of that island, to construct the Neogene history of the southeastern corner of the Caribbean.

The hinge zone between the Lesser Antillean convergent plate boundary and the transform plate boundary zone along the northern coast of South America has migrated from west to east at about 20 mm/year during the Neogene and now lies 500 km east of where it was 25 million years ago.

The east-west trending plate boundary zone is about 250 kilometers wide from north to south and contains a dozen major east-west strike-slip faults, between which there are prominent secondary compressional structures (e.g., the Tobago anticline) and extensional structures (e.g., the Cariaco pull-apart).

About 25 million years ago, the Orinoco flowed to the north-north-east and reached the coast on the rifted margin of South America which had formed at the beginning of the Cretaceous as the Yucatan separated from the southern continent. Resedimentation from the Orinoco delta front 25 million years ago deposited the material now represented in the Scotland District of Barbados which was incorporated very soon afterwards into the accretionary prism of the Lesser Antilles.

As the hinge zone swept eastward, it carried with it rocks from the Cretaceous Atlantic-type margin of South America as well as rocks of an island arc system that had collided with South America in the Paleogene. These rocks are now exposed in the Araya Peninsula, the Northern Range of Trinidad and in Tobago. Slivers of ocean floor rocks caught between the colliding arc and the continent are only locally exposed.

The eastward tectonic transport of the material now forming the Araya Peninsula and Northern Trinidad constructed a coastal range which diverted the Orinoco mouth progressively eastward. Most of the sediments in Trinidad consist of material laid down in this Miocene and younger Orinoco delta. Within the last 5 million years, the El Pilar Fault Zone separating the mainly Orinoco derived sediments of Eastern Venezuela and Trinidad from the transported Northern Range and Araya Peninsula rocks, has sliced across the Caroni basin of Trinidad, cutting it in half and offsetting the two halves by about 40 km.