NEOGENE PHOSPHOGENESIS

IGCP—Project on phosphorites—Project 156 was inaugurated in 1978, and since then has become an important focal point for all scientists active in the investigation of this commercially important rock type. The 8th International Workshop and Symposia on Neogene Phosphogenic System held in North Carolina and Florida, between May 6-17, 1985, was a part of the annual event of this project. The earlier Workshops and Seminars were held in Australia (1978), Western USA (1979), Mongolia (1980), India (1981), China (1982), Morocco-Senegal (1983), and Kazakistan (1984). During the 1984 meeting in Kazakistan, the project leadership changed hands and Peter Cook and John Shergold stepped down to hand over charge to Stan Riggs of East Carolina University and Bill Burnett of University of Florida. With this change, project also changed its thrust from Proterozoic-Cambrian phosphorites to younger phosphogenic system.

The 8th International was attended by 100 scientists from 36 countries and included four Indian delegates. The programme commenced with a full day seminar (Seminar I) in which papers related to phosphorite-bearing areas of S. E. United States and other field areas to be visited during the first leg of the workshop, were presented and discussed. This was followed by extensive field work through Neogene coastal outcrops of North Carolina and a day long ride on the exploration ship R/V *Cape Hatteras* in Onslow Bay in order to study high resolution seismic profiling, data reduction, side scan sonar, bottom sampling, coring and mining of phosphorites on the outer continental shelf of the Western Atlantic. Roughings in the sea waves made several participants sick. Next 3 days were spent in visiting Lee Creek Mine owned by Texas Gulf Chemicals and South Creek Mine owned by North Carolina Phosphate Corporation, both in Aurora area. Visits to these mines gave an insight to the nature of North Carolina phosphorites and methods of operation in this high technology oriented country. Massive dredging operations, dragline tour to ore piles, sump slurry operation, dredging, mine reclamation, groundwater management and dewatering system were demonstrated. A conducted tour of the mill, concentrators, acid plant, fertilizer plant and loading facilities, completed our North Carolina field itinerary.

Seminar II was held in the University of East Carolina at Greenville, on May 10, to focus attention on points raised during the first field trip, to listen to points of view of various participants and to discuss original research on Neogene phosphorites from other parts of the world.

On 11th May, three small chartered planes were commissioned to fly the participants over the S. E. Atlantic Coast, looking down at Cape Fear deposit of N. C. and S. C. Ga. phosphate deposit, the North Florida deposits, Trail Ridge, Ocala Upland and Central and South Florida deposits. The flights at 2000 to 3000 feet height were undertaken to study the coastal features and the barrier island system of sedimentation. Next four days were spent visiting Fort Meade and Hardee Phosphate mines of Bone Valley in Florida. Bone Valley area alone contributes a third of the total phosphate resources of the world. These deposits offer best outcrops for the study of weathering in primary phosphorite, mineral transformations and clay mineral formation. Florida ore was seen to be soft and clayey

in most of the pits. Mining operations and Ore processing systems were more or less similar to those in North Carolina. Saddle Creek Mines owned by 'Agrico' and Clearspring Mine of I.M.C. were visited to study weathering profiles and to compare variations in mineral transformations. Lecante Quarry and Caroll Construction Co were visited to study Palaeogene limestones of Ocala High, which seem to have controlled phosphate distribution in the region. In Hooker's Prairie Mine, a study of case hardened phoscrete—a form of phosphorite formed by connate water leaching, was highly informative. To my mind, several such outcrops do exist in our country, which have not been tested for phosphorite.

On 16th and 17th May, Seminar III and IV were held as a special symposia in Tallahassee, where invited speakers presented their brain-storming viewpoints, often contradicting the last speaker's calculations and hypotheses. Stalwarts like Bob Garrels, Bob Berner, Dick Sheldon, Miriam Kastner, participated in the Tallahassee Symposium on 'Genesis of Neogene to Modern Phosphorites'. Four major topics—involving modern setting, rates of processes of formation, associated mineral formation and the Neogene environments were discussed. While certain ideas prevailed over others, there was no general consensus on the origin of this evasive rock.

The annual business meeting of IGCP – 156 was held in Lakeland and the Venezuela's offer of holding the next International Workshop and Seminar in May 1986 was accepted.

Department of Geology
University of Delhi
Delhi 110 007

D. M. BANERJEE

FOR GEOLOGY, THE ULTIMATE LABORATORY IS THE ENTIRE EARTH

For geology, unlike most other fields of science, the ultimate laboratory is the entire Earth, and its practitioners need access to all parts of that laboratory at all times. The only way they can obtain it is through open and unfettered participation in research programs by all of the world's countries.

From *Geotimes*, May 1985