Petrological Study in the Northeastern India Ophiolite Belt – Bidyananda Maibam, Department of Earth Sciences, Manipur University, Canchipur, Imphal – 795 003

Investigations on cratonic and off-craton continental mantle lithosphere have been mainly focused on ultramafic xenoliths enclosed in kimberlite or alkali basalt lavas and/or orogenic iherzolite massifs, on the other hand, the abyssal peridotites collected from oceanic floor are believed to represent the modern oceanic lithospheric mantle. Ophiolite belts worldwide represent remnants of ancient oceanic lithosphere which escaped subduction. Mantle-derived xenoliths and alpine-type ultramafic massifs are the major source of information about the physical and chemical properties and processes of the uppermost mantle.

The Indo-Myanmar Belt Ophiolite (IMBO) sequence forms a belt extending about 200 km from Pukhpur (Nagaland state) in the north to Moreh (Manipur state) in the south. The belt consists of different igneous, metamorphic and sedimentary rock components. Ultramafic rocks forming the main component of the belt consists of mantle sequence of tectonised peridotites with mafic intrusives, volcanic rocks, pelagic sediments (Bhattacharjee, C.C., 1991, Tectonophysics, v.191, pp.213-222). The northeastern India ophiolite belt provides a good opportunity for the comprehensive study of fragments of oceanic lithosphere. The present study describes major and trace element compositions of accessory and rock forming minerals of different litho units from the Indo-Myanmar Ophiolite Belt. The aim of this study is to use the petrographic analyses and phase geochemical data to (1) present a basic compositional characterization of the ophiolite, (2) estimate the equilibrium condition of the rocks and (3) understand the nature of the lithospheric mantle beneath the region.

Summary of the lecture delivered at the monthly meeting of the Geological Society of India on 25 April 2012.

High Resolution Climatic Record Entombed in Fossil Hominid Dental Enamel – Rajeev Patnaik, Center for Advanced Study in Geology, Panjab University, Chandigarh, India

Global climate has fluctuated drastically since the Late Miocene, causing an overall cooling, drying, fragmentation of rain-forests, occurrence of glacial-interglacial cycles, draughts-floods, effecting tropical Africa and Asia. We humans, apes and our extinct ancestors, grouped together in a family called hominidae, have evolved in response to these climatic fluctuations, by continuously adapting to changing ecological conditions. Therefore, like other terrestrial proxies such as tree rings, palaeosols, speleothemes, fluvio-lacustrine sediments, peat deposits, microfossils, magnetic minerals and plant phytoliths, hominid dental enamel is a potential archive for high resolution palaeoclimate studies. Hominid dental enamel grows periodically in a rhythemic manner producing daily increments known as cross striations. Incremental lines of longer duration comprising on an average 7-9 cross striations are termed as Retzius lines.

Manifestation of these Retzius lines on the tooth enamel surface is termed as Perikymata, which in turn can facilitate the determination of growth rate of an individual. More importantly, these enamel growth lines preserve a continuous record of water and vegetation intake in the form of stable oxygen and carbon isotopes, respectively. The oxygen isotope composition of tooth enamel (or $\delta^{18}O$ bioapatite) is determined by the $\delta^{18}O$ value of herbivore body water ($\delta^{18}Obw$), which is primarily influenced by ingested drinking and leaf water, reflecting the ambient temperature and rainfall. The carbon isotope composition of mammalian tooth enamel ($\delta^{13}C$ bioapatite) is correlated with the type of vegetation that an individual consumes. For instance, C4 grasses have $\delta^{13}C$ values around -10 to -14‰ and C3 trees and shrubs show $\delta^{13}C$ values ranging from -21 to -32‰. Therefore, intra-tooth laser ablation based micro-sampling can provide a record of isotopic variation during the formation of the tooth enamel, representing a partially time-averaged archive of ancient seasonality.

Summary of the lecture delivered at the monthly meeting of the Geological Society of India on 28 March 2012.

Compositional Variations in the Mesoarchean Chromites of the Nuggihalli Schist Belt, Western Dharwar Craton (India): Potential Parental Melts and Implications for Tectonic Settings – Ria Mukherjee**,** CSIR Senior Research Fellow, Department of Geological Sciences, Jadavpur University, Kolkata - 700 032 (*Email: ria.mkrj@gmail.com*)

Chromite is an important accessory mineral in ultramafic magmas and along with its robust nature it constitutes an important tool to study about the parental magma from which the chromite crystallized, and the tectonic setting of the chromitite deposits. Chromite composition is a reflection of the parent magma composition, which itself is a manifestation of tectonic settings. However, the petrogenetic inferences should be made with caution as chromite is sometimes subjected