Presented by ANTONIO C. ROCHA-CAMPOS

The great part of the Amazon landscape has been developed over lateritic terrain. Geomorphological aspects, horizon toposequence, as well as the textural, mineralogical and chemical characteristics of the laterites leads to recognition of the two most important lateritization cycles in the region. The first one during the Early Tertiary created **Mature Laterites**, and the second during the Late Tertiary and Quaternary created **Immature Laterites**. Over the mature laterites developed the plateau landscape, represented for example by the regions of Carriages, Torments, Paragominas, Maicuru and Maraconaí, State of Pará; Pitinga, Seis Lagos, State of Amazonas; and Gurupi-Maracaçumé, states of Pará and Maranhão. Associated are large ore deposits (iron, bauxite, kaolin and manganese, also gold and Al-phosphates). On the other hand, the immature laterites developed on lowland plains, except in areas occupied by Quaternary sediments, even between the plateaus with mature laterites. This means that most of the present Amazon landscape developed over immature laterites. These laterites are barren of bauxite, Al-phosphates and high-grade iron ore but they do contain less important kaolin, manganese and gold deposits.

The mature laterites display well developed vertical profile with thick iron crust. The typical minerals are gibbsite, crandallite group minerals, variscite, wardite, augelite and hematite, which are not found in the immature laterites, except hematite. Mature laterites are strongly leached of SiO_2 and alkalis, but Al_2O_3 and Fe_2O_3 are enriched in comparison to the immature ones. Mature and immature laterites suffered distinct alteration processes after their formation (latosol formation, neotectonic deformation, erosion, bedrock of lake sediments and swamps, podzol formation, etc.).

These laterites and their alteration products demonstrated that the Amazon region experienced several climatic changes during the Tertiary and Quaternary. A long humid and hot to dry climate phase caused formation of the mature laterites followed by very humid phase which formed thick latosols. A second humid to briefly dry climate phase developed the immature laterites. Finally during the Quaternary a very humid climate, with a very short dry hiatus generates widespread latosols, sand podzols, lake sediments, lake and swamp iron carbonates and most recently the lakes, swamps and the dense, extensive drainage system plus the lush rain forest. — (*December 8, 2000*) .

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MACRO AND MICROPHYTOFOSSILS STUDY OF THE ITARARÉ SUBGROUP AT KM 96 Of BANDEIRANTES HIGHWAY, CAMPINAS MUNICIPALITY, SP*

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Presented by ANTONIO C. ROCHA-CAMPOS

Outcrops recently exposed by construction at Km 96 of Bandeirantes highway, near Campinas, SP, have yielded a phytofossiliferous assemblage of abundant megaspores, bryophytic axes, unidentified caulinar axes and palynomorphs in massive dark-gray mudstones, with rhythmic intercalations of very bioturbated fine and very fine sandstone of the Itararé Subgroup. The following taxa have been identified:

Megaspores – *Sublagenicula brasiliensis*, *Sublagenicula sinuata*, *Calamospora* sp. and *Trileites tenuis*;

Palynomorphs – *Puntactisporites gretensis*, *Psomospora detecta*, *Cristatisporites rollerii*, *Cristatisporites morungavensis*, *Cristatisporites spinosus*, *Cristatisporites* sp. 1, *Cristatisporites* sp. 2, *Lundbladispora riobonitensis*, *Vallatisporites ciliaris*, *Vallatisporites vallatus*, *Vallatisporites* sp., *Raistrickia rotunda*, *Raistrickia pinguis*, *Plicatipollenites malabarensis*, *Plicatipolletines gondwanensis*, *Potonieisporites brasiliensis*, *Potonieisporites novicus*, *Potonieisporites magnus*, *Potonieisporites neglectus*, *Limitisporites rectus* and *Limitisporites hexagonales*;

Macrophytofossils – *aff. Dwykea* sp.

This phytofossiliferous association suggests the

existence of a possibly tundra-like vegetal covering, consisting of bryophytes, lycophytes, sphenophytes and gymnosperms (probable pteridospermaleans and coniferaleans). The bryophytes may have occupied coastal rocks; the lycophytes, coastal plains; the sphenophytes, river banks; and the pteridospermaleans and coniferaleans, higher continental areas.

As for the depositional environment, we can infer its proximity to the continent, based on the abundance of megaspores; on the similarity of pollen grain and spore frequencies, including preserved tetrads; and on the delicate leafy caulidium of the bryophytes.

These strata belong to the *Ahrensisporites cristatus* Interval Zone, which is considered as Westphalian in age (Souza PA.2000, unpublished Doctoral Thesis, IGc/USP), of the lower portion of the Itararé Subgroup. — (*December 8, 2000*) .

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HEAVY METALS OF THE ANTA STREAM S. J. RIO PRETO – SP

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Presented by Antonio C. Rocha-Campos

Diverse anthropic activities have produced meaningful quantities of residues, in which metallic elements can be found with differential forms of retention and mobility with the environment. Therefore, it is of great importance that their fixation and mobilization be studied in different environmental settings.

This study attempt to quantify metal ion pollutants from a variety of sources and their dispersion in soils, sediments, surface waters, and groundwater. Risks upon fish will also be evaluated, as fish have several physiological systems similar to those in homeothermic animals and commonly make up part of the human food chain. Such ions will be used as biomonitors, in order to establish co-relationship among the following systems: polluted environments, fish and aquatic plants.

The study site comprehends a portion of the Anta Stream northeast of São José do Rio Preto, São Paulo, which drains into the Rio Preto within the Turvo/Grande watershed. At the study site there occur several recent urban nuclei, a sanitary landfill (Construfert) with compost facility provided with capture and treatment of leachates, and a bone flour and tallow factory (Sebo-Sol).

The behavior of such ions with the biota will be determined by monitoring their harmful effects on the environment through biomonitors, systematic collection of water, and sequential extractions of soils, sediments, etc. — (*December 8, 2000*) .

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HIGH-FREQUENCY/LOW AMPLITUDE EUSTATIC PARASEQUENCES IN NEOPROTEROZOIC ALTO PARAGUAI BASIN (MATO GROSSO, BRAZIL)*

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Presented by Antonio C. Rocha-Campos

Stratigraphic analysis of terrigenous and carbonate deposits of the Alto Paraguai basin revealed two third-order sequences (1-10 m.y.), consisting of glacial, platform, tidal-, wave- and storm-dominated shoreline, fluvial and deltaic depositional systems. Each sequence begins as a lowstand system tract followed by transgressive and highstand periods. Carbonate parasequences of Sequence 1, analyzed in outcrops in the Cáceres region, Mato Grosso, attributable to the Araras and, in part, the Raizama formations, were deposited in a warm peritidal setting made up of: association (1) subtidal deposits of dolomicrite, intradolomicrite, oosparrudite, low-angle to planar cross-stratified sandstone and siltstones; and association (2) inter- to supratidal facies consisting of dolomicrite, intradolomicrite and wavy- to megaripple-bedded intraclastic sandstone. Other features in the association (2) are hemispheroidal, planar and brain-like stromatolites, fenestral and birdseye laminations, desiccation cracks, rip-up clasts, curled mud flakes, pseudomorphs of nodular gypsum, and stromaclast/tepee breccia. The stacking patterns of meter-scale shallowing/brining-up parasequences form