the waters from Pattanchern area of A P to indiscriminate disposal of industrial effluents and improper storage of solid wastes Naresh Jadhav also opines that the heavy metal concentration in Boduppal Cheru around Hyderabad is due to indiscriminate dumping of wastes by nearby industries thereby disturbing the ecological balance Sunitha observed that the polluted groundwater at Kottur industrial area is the result of indiscriminate release of the nearby textile industries She also discussed the impact of this contaminated water on the health aspect and suggested a few remedial measures Madhuri carried out physico-chemical studies of groundwaters from Nacharam industrial area around Hyderabad and observed that the polluted and deteriorating quality of groundwater is mainly due to the toxic effluents released by the industries in the vicinity

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SOME VIEWS ON NEOGENE STRATIGRAPHY OF THE ASSAM PLATFORM

1 1 The author's observations of the Neogene formations from the electrical logs of Brahmaputra valley and their correlations with their exposures in the Schuppen Belt of Assam and their extension into the Surma-Barak valley region of Cachaar called for a certain rethinking and need for a revised classification of those formations Certain comparisons/contrasts with the Neogene stratigraphy of the northwestern India also seemed relevant These ideas are elaborated for a wider consideration by geoscientists

1 2 Neogene stratigraphy in northwest India starts with the Himalayan flysch - the Murree sediments, magnificently exposed in the Poonch-Rajouri belt of Jammu area and the Dagshai-Kasauli beds (collectively Dharmsalas) west of the Yamuna They do not continue east of the Yamuna where the pre-Cambrians (phyllite, schist and quartzite) are thrust over the Siwaliks Lithologically the Murree- Dagshai-Kasauli are deep brown, well stratified sandstones with minor well stratified brown sandstones The southern boundary has been referred to as the Great Boundary Fault To their north lie the Subathus (Eocene) rocks, not observed east beyond Nainital The Murree-Dharmsalas occupy Aquitanian-Burdigalian range with possible extension into Lower Siwalik (Kamlial-Helvation stage) Only HM (Heavy Mineral) and palynological studies established their identity Dharmsalas have been observed in the Janauri well drilled by the ONGC Thus it may be inferred that the Flysch basin terminated west of the Yamuna, yielding a profound Oligocene unconformity, to be also observed in the northeast (Assam) In general, Oligocene was a period of non-sedimentation, possibly exposed land area over-thrust by the Eocene (Subathu) and pre-Eocene rocks

2 1 The Neogene sequence following the Flysch is the Molasse Siwalik foreland basin commencing from Helvitian (Kamlial) and building up to Boulder Conglomerate (Cromarian) litho-chrono stratigraphic levels Its sub-montane contact with the Gangetic plain marks the final phase of the Himalayan orogeny These dip homoclinally under the Siwalik hills and are underlain by the Krols/ Vindhyans

3 2 S N Talukdar is the living authority on Siwalik stratigraphy V Rai Verman another ONGC geologist proposed eight-fold En-Seq (energy sequence) classification of the Siwaliks

4 1 We now shift to the northeast Assam - Cachaar and Tripura regions AOC geologists Percy Evans, W B Metre and A B Das Gupta classified the Paleogene and Neogene sedimentary formations of this region - a classification so far unchanged Tectonically this region comprises Assam platform, a miogeosynclinal basin and the Schuppen Belt accommodating an imbricate homoclinally dipping sedimentary formation extending from the Disang (Paleogene) sediments to Dekiajuli-Dihing (Quaternary) systems Successively upwards these are

Assam Platform	Schuppen Belt	Standard Time Scale
Dekiajuli Dihing (silts)	Not observed	Quaternary
Tipam Girujan clay (massive sandstone with minor clay beds)	Tipam (sandstone)	Mio Pliocene
Barail (Sandstone clay with coal beds)	Barail (sandstone and clay with massive coal beds)	Oligocene (Aquitanian)
Jaintia/Kopili (Sandstone)	Disang Limestone (indurated)	Eocene
Slyhet Limestone	Dirang	Eocene
Chenna/Tenighat Sandstone) oil bearing with Borhalla Chungmai goan beds	Not observed	Pre Tertiary to Cretaceous

4.2The Schuppen belt is bounded in the south by the Naga Thrust. There are some interior thrusts also. In its easternmost part it is represented by pre-Tertiary/Cretaceous serpentinzed ophiolite rocks up to and across Indo-Myanmar boundary. This synclinal belt is referred to as Manabhum-Patkoi, Saramati-Arakan syncline (B. Biswas, SVOC) or Axial belt. It is possible that the Assam Schuppen sequence is repeated in the Pegu system of Myanmar. Drilling in Geleki has revealed extension of platform sediments below the Naga Thrust.

5.1 It is the express purpose of this note to examine the stratigraphic status of the Tipams in the Assam platform. The Tipams of Tripura and Cachaar extend into the Schuppen belt of Assam and are exposed over the Naga Thrust. The Surma is a very thick sandstone. Upwards, there is no clear-cut contact with the Tipam sandstone and in the Assam exposures this is totally lost. In the electrologs of Assam wells (Nahorkatia-Moran-Lakwa-Rudrasagar structures) the Surmas are hardly identifiable and the entire post-Barail sandstone sequence can be considered as one unit. AOC Geologists based their stratigraphic grouping on the basis of Heavy Mineral (HM) differences. Outside of Cachaar and Tripura, the Surmas have been distinguished as Laisong-Jenam-Renji units, possibly on fossil evidence. The post-Barail sandstone units (Tipams) are devoid of any marine charactenistic fossils. Palynology cannot also be a safe basis since salting is a distinct possibility (AOC had no palyological lab or specialists to undertake palynological studies). They were for the first time established in ONGC by Messrs. A.K. Ghosh and R.K. Verma (the latter from the B.S. Institute, Lucknow)

5.2 As for HM evidence, question arises whether HM assemblages reflect their provenances. The minor mineral constituents of Shillong gneiss or Mikir granite are biotite and other accessories. These Arcahean rocks have been subjected to at least four periods of emplacement and diastrophism that any assumption as to their specific erosion levels contributing HM assemblages will be far fetched and unrealistic. A way out could be radiometric correlations of the provenance and RM assemblages; this could perhaps be considered by geoscience bodies/researchers.

5.3 On the basis of these considerations, the author argues that Surma-Tipam sedimentation was an isochronal process under same paleogeographic setup. As for their volumetric content, Shillong gneiss and Mikir granite, under the devastating flood conditions and meteorological location of the region, can account for the material balance (sediment budget) of the fill.

6.1 Finally certain observations on the hydrogeology of Assam sedimentary formations' connate waters seem to be relevant. The connate waters of the Barail sediments have salinity of about 5 g/litre, waters of the Tipam sediments have a salinity of less than 3 g/litre. Also pressures in the Assam platform formations are hydrostatics (1 kg cm^{-2}/ 10 m (1 x 10^4 pascals) approximately save for some over-pressured Barail strata in the Lakwa field. Artesian heads, due to inflow from the Schuppen belt are not evident. Oil-water contents are horizontal and no hydrodynamic tilts are noticeable.

7.1 In this article stratigraphic terms such as strata, member, series, group etc. are loosely used in violation of stratigraphic definitions set by Krumbein and Sloss' "Stratigraphy and Sedimentation" or AGI dictionary. The author craves the indulgence of stratigraphic purists.

8.1 The ideas and viewpoints put forward herein need deeper study by specialists in GSI, ONGC and OIL.

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INTERNATIONAL SEMINAR ON COAL SCIENCE AND TECHNOLOGY EMERGING GLOBAL DIMENSIONS (GLOBAL COAL–2005)

Coal, the dominant energy resource presently, will continue to reign as the primary energy resource in the foreseeable future. Global head coal consumption in 2003 was 4,058 million tons against production of 4,037.5 million tons. Coal demand grew about 1 billion tons between 1980 and 2004. Increased demand for energy attracted the attention of coal scientists to develop newer techniques of coal exploration and utilization to fulfill the demand. Fast depletion and acute scarcity of coking/ low-ash coals, needed for steel industries, compelled the scientists/ technologists to use non-coking low rank coals for coke formation and to explore more utilizational prospects of these coals and any other carbonaceous matter that otherwise cannot be used in coking industries.

Switch over from coking to noncoking coals lead to the scientific/technological innovations in various spheres of