(table 2). Thus increased arginase levels may be the principal cause for the increased blood urea levels in perchlorate-treated rats.

30 June 1986; Revised 21 August 1986

1. Vos, E. A., *Neth. Milk Dairy J.*, 1949, **3,** 231.
2. Karki, A. B. and Kaiser, P., *Rocz-Glebozm.*, 1975, **26,** 213.
3. Makarevich-Galperin, L. M., Ushenko, S. N. and Breslowskii, R., *Ukrain Biokhimzhur.*, 1958, **30,** 678.
4. Makarevich-Galperin, L. M. and Ushenko, S. N., *Patol Fiziol iekspti Terapiya.*, 1959, **3,** 63.
5. Gauss, W. and Rrosk, Z. M., *Anat. Forsch.*, 1972, **85,** 469.
6. Kiseler, A. F., Agafonov, V. I. and Rudyaga, T. I., *Biokhim-Pitan. Sel'skokhoz-Zhivotn.*, 1972, **6,** 49.
7. Spreca, A., Laszlo, M. and Musy, J. P., *Pharm. Acta Helv.*, 1973, **48,** 297.
8. Dubowski, K. M., *Clin. Chem.*, 1962, **8,** 215.
9. Sasaki, T. and Matsui, S., *Rinsho Kagaku.*, 1972, **1,** 346.
10. Geyer, J. W. and Dabich, D., *Anal. Biochem.*, 1971, **39,** 412.
11. King, J., In: *Practical clinical enzymology*, D. Van Nostrand, London, 1965, p. 106.
12. Koide, H. and Oda, T., *Clin. Chem. Acta.*, 1959, **4,** 554.
13. Herzfeld, A. and Raper, S. M., *Biochem. J.*, 1976, **153,** 469.
14. Lowry, O. H., Rosebrough, N. J., Farr, A. I. and Randall, R. J., *J. Biol. Chem.*, 1951, **193,** 265.
15. Kozak, L. P. and Wells, W. W., *Arch. Biochem. Biophys.*, 1969, **135,** 371.

LATE HOLOCENE EVIDENCE OF NEOTECTONICS IN THE UPPER VASHISHTHI VALLEY (WESTERN MAHARASHTRA)

V. S. KALE, S. N. RAJAGURU* and G. RAJAGOPALAN**
Department of Geography, University of Poona, Pune 411 007, India.
**Department of Archaeology, Deccan College, Pune 411 006, India.*
*** Birbal Sahni Institute of Palaeobotany, Lucknow 226 007, India.*

THE Koyna-Pophali region, coinciding with the headwaters of the Vashishthi river, is a known earthquake prone region. Gravity data indicate possible fault to the west of Koyna, in Pophali area and between Rampur and Guhagar, indicating a tectonic sag in the Koyna area[1]. A number of thermal springs and strong negative anomalies in the Western Ghat section and more strong positive anomalies in the coastal tract corraborate this inference and suggest a zone of tectonic impress. The seismo-tectonic status of the area is also reflected in the anomalous channel characteristics of the Vashishthi river.

The channel of upper Vashishthi exhibits a braided pattern, with bars in the upstream and strongly braided channel in the downstream. The width/depth ratio near Pophali, is > 49 and the channel actively cuts its banks. Despite the braided planform, the main feature of the channel is incision and terrace formation. The lithosection (figure 1) observed at the site reveals, the predominance of ungraded bouldery-cobbly-pebbly gravel (1.8–2.1 m in thickness and > 200 m width) which is in fact, a misfit in the present humid morphogenetic environment. The textural and the sedimentological properties of the gravel suggest excessive local aggradation from the Ghat slopes as well as the incompetence of the river to transport the sediments downstream[2].

The great influx of cobbly-pebbly sediments indicates an adjustment in geomorphic regimen from three possible sources, namely catastropic floods, landslides, and tectonic movements. Floods of unusual magnitude in the Vashishthi headwaters will cause vigourous erosion and incision in such a hilly terrain[3]. Similarly, a pluvial phase will result in accelerated chemical weathering and increased supply of finer sediments. In response to such a change in the load, the river will be transformed

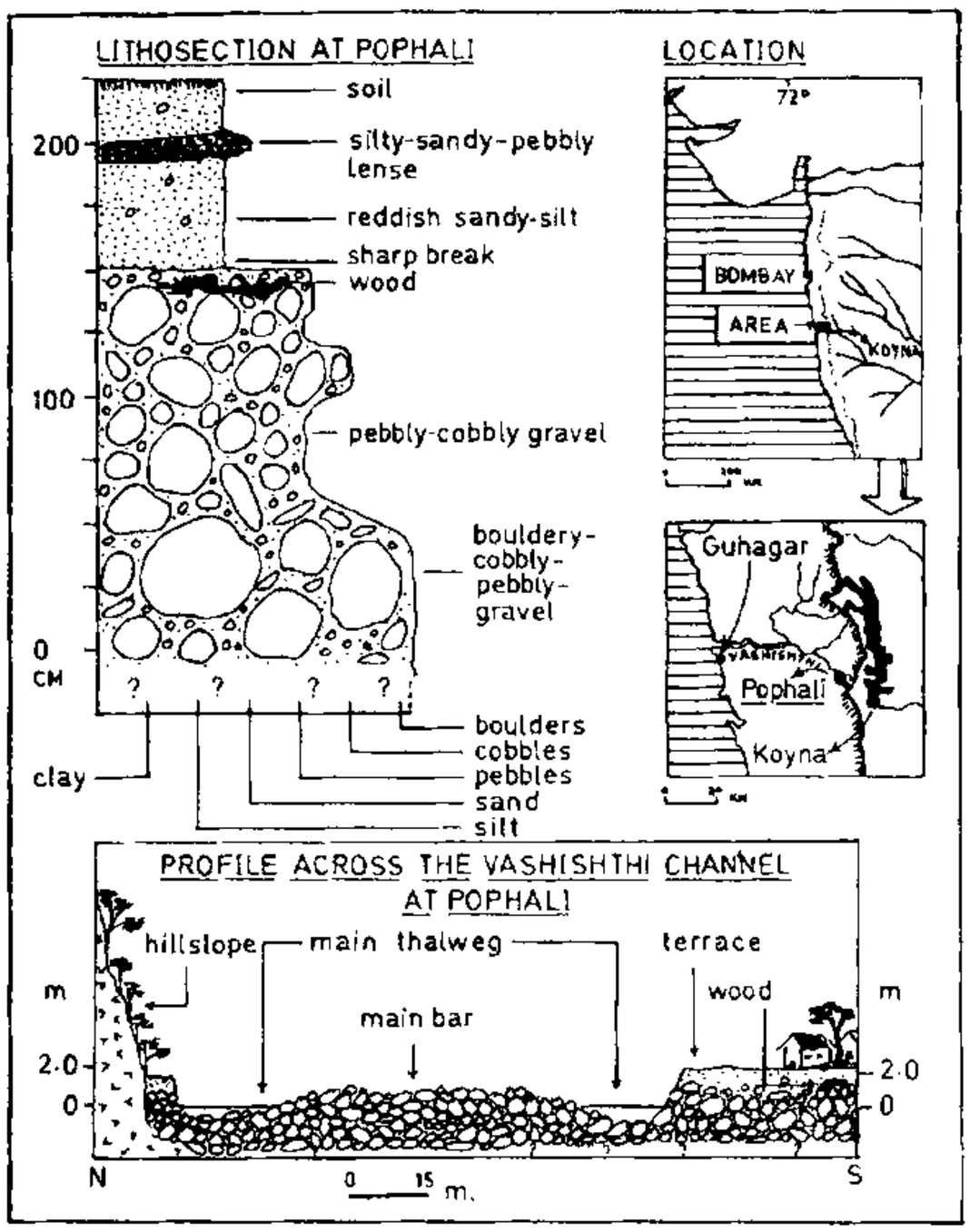

Figure 1. Location and the lithosection of the Pophali site.

from what was apparently a bedload or mixed-load channel to a suspended load channel. On the other hand, large scale landslides, following hillslope failures will contribute debris flows with a predominent component of angular material. Evidences of such changes, although seen on the hillslopes, are not revealed by the channel sediments[4]. In such circumstances, the probability of a tectonic control is considerably increased. Flume experiments have indicated the development of braided pattern, as a result of aggradation in response to excesses sediment supply, from valley slopes deformed by active tectonic movements[5]. The experiments have further shown that the main feature of braid-stream response to tectonic movements is incision and terrace formation[5]. Indications of such changes are available in the channel and, therefore, the transformation of the channel can be attributed to great influx of coarse sediments in response to neotectonic activity.

If the concept that alteration of fluvial regimen of the Vashisthti river will cause river metamorphosis is correct, then the effect of tectonic activity on the river should be recognized in the river channel adjustment. An evidence of such a change is available in the presence of a fossilized drift wood. The wood was discovered in a trench at Pophali (figure 1) about 30 m from the southern bank of river Vashishthi. Radiocarbon dating of the sample has revealed an age of 730 ± 100 yr BP (BS 666). The date suggests that the river not only migrated by a few tens of metres in the last 700 years or so but has subsequently incised by 2.0–2.5 metres. Such rapid alterations in the regimen of the river system, viewed together with the recent geophysical data suggest the presence of neo-tectonic movements in the region, and the Vashishthi river appears to be adjusting all aspects of its morphology to provide the correct hydraulics.

The authors are grateful to Dr Y. S. Sahasrabudhe for guidance and helpful criticism.

10 July 1986

1. Kailasum, L. N., *Tectonophysics*, 1975, **29,** 505.
2. Morisawa, M., *Rivers*, Longman, London, 1985, 112.
3. Schumm, S. A., *J. Hydra. Div.*, 1969, **95,** 255.
4. Guzder, S., *Quaternary Env. stone age cultures of the Konkan coastal Maharashtra*, 1980, Deccan Collage, Pune.
5. Ouchi, S., *Geol. Soc. Am. Bull.*, 1985, **96,** 504.

GRAIN SIZE ANALYSIS AND SURFACE TEXTURES OF COASTAL RED SANDS AROUND MUTTOM, KANYAKUMARI DISTRICT AND THEIR IMPLICATIONS ON ENVIRONMENT OF DEPOSITION

C. P. RAJENDRAN, NARAYANASWAMY and J. P. CHITRAPRABHA
Centre for Earth Science Studies, Trivandrum 695 010, India.

THE red sand (Pliestocene to Recent) seen on the coastal tract of Kerala, especially around south of Trivandrum and Kanyakumari Districts and in the North Kerala, is locally known as 'teri'. It constitutes a distinct sequence with characteristic red colour and overlies both sedimentary and crystalline rocks. The present study is concerned with the red sands in the Muttom sea shore (figure 1). These