Director General, Geological Survey of India, Western Region, for critical review of the manuscript and the Director General, Geological Survey of India for permission to publish this paper. Thanks are due to the Director U.S.I.S., New Delhi who kindly made the space photograph available.

REFERENCES

BASHILOVA, I. I., EREMIN, V. K. and MAKIN, G. V., (1971) The utilization of near-space television images of the earth in the study of regional geological structure. *Proc. VII Int. Sym. Rem. Sen. Ann. Arbor.*

LATHRAM, E. H., (1972) Nimbus IV view of the major structural features of Alaska, *Science*, v. 175, no. 4629, pp. 1427.

LOWMAN. JR., P. D., (1969) Geologic oribital photography; experience from the Gemini Programme. *Photogrammetria*, v. 24 (3/4), pp. 77-106.

MEER MOHR, H. E. C., V. D. (1968) Geological interpretation of hyper-altitude photographs from Gemini Space craft. *Conf. Inst. Soc. Photogram. 11th, Lausanne.*

——— and KRISHNANUNNI, K., (1971) Evaluation of hyper-altitude photography for geological mapping. *Proc. VII Int. Sym. Rem. Sen: 1971*, Ann Arbor.

SAID, RUSHDI, (1962) *The Geology of Egypt*. pp. 18-27. Elsevier Publishing Company, Amsterdam, New York.

WOBBER, F. J., (1967) Space photography: a new analytical tool for the sedimentologist. *Sedimentology*, v. 9 (r): pp. 265-317.

GEOLOGY OF THE RANGIT VALLEY COALFIELD AROUND NAYA BAZAR AND NAMCHI, SIKKIM—A PRELIMINARY REPORT

B. C. MUKHERJEE AND S. CHAUDHURI
Department of Geological Sciences, Jadavpur University, Calcutta

Introduction: The Rangit valley coalfield is geologically very interesting because it occurs in the Eastern Himalaya and is detached from the main Gondwana coalfields of India. This coalfield is situated immediately north of India-Sikkim border and Naya Bazar, an important trade centre, and approximately 10 km due north of Darjeeling.

Lithology: The map (Fig. 1) shows four mappable units. The phyllites and quartzite association constitute the pre-Cambrian Daling Series. These rocks are exposed on the north-eastern and western margins of the field. On the northern end of the field, near Namchi, there occur slate and carbonate rock (dolomite). On the basis of lithology, similarity with the Baxa Series (age not clear) (Mallet, 1875) is evident. Most part of the area is occupied by light and dark coloured sandstones, shale (occasionally with black spots), black shale, pebble bed and coal. The shales often develop slaty character and it is probable that there are more than one sandstone and shale unit. These are Lower Gondwana rocks, indicated by the presence of typical Lower Gondwana *Glossopteris, Gangamopteris* and *Vertebraria* flora at a spot 1 km (approximately) south of Namchi along Namchi-Melli Road and also at about 2 km north of Naya Bazar along Naya Bazar – Geyzing Road. Within the Lower Gondwana rocks, near Naya Bazar there is an elliptical outcrop of black, green and red slate and pink carbonate rock. The nature of the contact of this association with Lower Gondwana rocks is not clear. Along Naya Bazar-Namchi Road, as one crosses this

outcrop, there is a broad zone of rock debris and this is followed towards north by Lower Gondwana rocks. Within the Lower Gondwana rocks there is a fault breccia accompanied by silicification. The northern contact between the Lower Gondwana and the slate-carbonate association is probably a fault. On the bed of Rangit river this carbonate rock (dolomite) shows dark bands with oolitic structure.

Besides these, there is a pebble bed near Namchi occurring in between Baxa Series and the Lower Gondwana rocks with pebbles of granitic rocks, slate and grey carbonate rock similar to the grey carbonate rock of the Baxa Series. This pebble bed has been described by Ghosh (1952) as representing Permocarboniferous marine transgression.

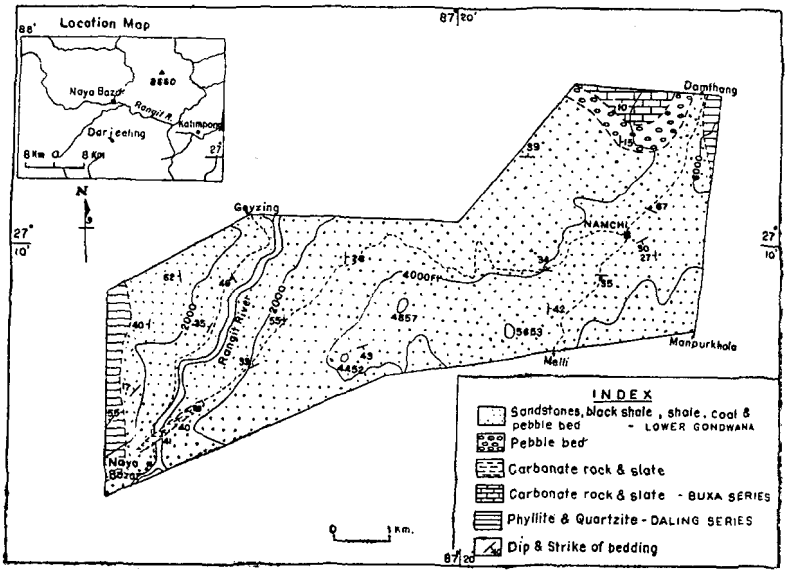

Figure 1. A tentative Geological map of area around Naya Bazar and Namchi, Sikkim.

Structural features: Dip and strike of the Lower Gondwana rocks are variable. On the western side of Rangit river, the dip is generally towards NW. Other planar structural elements include joints and cleavages. Near Naya Bazar joints in Lower Gondwana rocks give rise to rhombic fragments. The shales are generally slaty. Like slates, coal is also schistose here and is occasionally very flaky. There is more than one slip surfaces which bear distinct slickensides and pinnate structure. Such surfaces generally look black and are seen in sandstone, shales and coals. In coals, gloss develops on such a surface.

The regional structure of Lower Gondwana rocks is not known at present. The Lower Gondwana – Daling contacts are probably thrusts. That a zone of crushing occurs in between the two is evident in Naya Bazar – Soreng road section and also in Namchi – Damthang road section. In both the ends i.e., in eastern and western ends, the older Daling overlies younger Lower Gondwana which overlies Baxa Series.

References

GHOSH, A. M. N., (1952) Preliminary notes on Rangit valley Coalfield, Western Sikkim. *Ind. Min.*, v. 6, no. 3, pp. 131-140.

MALLET, F. R., (1875) On the Geology and Mineral Resources of the Darjeeling district and the Western Duars. *Mem. Geol. Surv. India*, v. 11, Pt. 1, pp. 33-39.