NUBRA-GARTANG SUPERLINEAMENT ITS GEOLOGICAL SIGNIFICANCE AND RELATION WITH THE INDUS SUTURE

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ABSTRACT

The authors interpreted a major lineament in Ladakh region on LANDSAT imagery and named it Nubra-Gartang superlineament, after the two rivers along which it is aligned for a considerable distance. The superlineament trending NW-SE, extends for a distance of 750 km from the Afghanistan border to southern Tibet. Structural and geomorphic evidences indicate that the lineament is perhaps still active and represents a dextral strike-slip fault. The fracture pattern and other tectonic elements suggest that a 'suture' zone is expected further to the north of this line in the Pamir region and the so called 'Indus suture zone' may be only a sister fracture to this superlineament. Occurrences of Quaternary volcanics along the superlineament are not ruled out and as such the zone offers a favourable locale for associated mineralisation.

INTRODUCTION

While preparing the lineament map of North Western Himalaya and the adjacent plains, a major linear feature was noticed in one of the LANDSAT-I imagery, running across the entire frame in NW-SE direction (plate I). This striking linear feature was very prominent and aroused interest of the authors to investigate its further continuation in the adjacent frames. This lineament extends along N40W-S40E direction persistently running from Bazar Darra (36°23';76°04') in the north to Gartok (31°45';80°20') and beyond in the south for a distance of 750 km. The lineament therefore has been classified as a superlineament and named as Nubra-Gartang superlineament after the two important rivers of the area along which it is aligned for a good distance. Reference about part of the lineament is available with descriptions as Karakoram fault (Molnar and Tappan, 1975) and Shyok linear zone of 'Jurassic-Cretaceous flysch (along the Shyok) with some ophiolites between Karakoram batholith and Ladakh granite' (GSI, 1976; Chatterjee et al., 1976).

Geological set-up:

The lineament, situated on the northern side of Ladakh cratonic mass, traverses
through the Lower Palaeozoic rocks, associated with acidic intrusive rocks of Tertiary age (plate II). The oldest rocks of Lower and Pre-Palaeozoic age are represented by schists trending NW-SE. These are overlain by Silurian-Devonian rocks of dominantly arenaceous composition occurring as lenticular patches and bands. On LANDSAT imagery the Lower Palaeozoic rocks show medium grey tone with medium coarse texture. The arenaceous bands are however, more prominent. The drainage, which is coarse to medium is generally structurally controlled. The acid intrusives of Tertiary age are concordant granite bodies and are represented on LANDSAT imagery by light mottled tone, coarse texture and coarse drainage pattern.

Occurrences of flysch sediments (Shyok ?) and ophiolites have been reported from the area southeast and in the neighbourhood of Chushul (GSI Geological map, 1962). These formations on LANDSAT imagery are seen as dark toned patches having fine and smooth texture in band 7.

The photo-expression representing Indus Flysch and Ophiolite suite of rocks, have also been observed along the lineament in the area NW of Chushul and in the Nubra valley in the west. The Chushul occurrence of ophiolite has been corroborated by Chaturvedi and Dave, who lead the geological expedition to Shyok valley organised by University of Roorkee, Roorkee, during 1976 (personal communication). Presence of basic volcanic rocks along with agglomerates have been reported from the southern vicinity of the confluence of Nubra and Shyok rivers (Kurien and Raina, 1956). A similar photo-expression in the eastern part of the area around Gartok has also been interpreted, indicating possible occurrence of ophiolite and associated rocks.

### Structural set-up:

In all four sets of lineaments have been interpreted (plate III). These in order of preponderance, are along:

1. NW—SE,
2. NE—SW,
3. N—S and
4. E—W

Nubra-Gartang superlineament confirming to the first set is quite prominent and is continuously traceable on LANDSAT imagery between Gartok and Chushul and further northwestward up to Nubra valley. Minor offsets due to NE-SW and N-S lineaments have been observed. Beyond Nubra valley the lineament is dislocated and it splays out, gradually loosing its manifestation on the imagery. Southeast of Gartok, the lineament behaves in a similar fashion.

Arcuate structural trends and lithological bands exposed on either side of the lineament are truncated. Abrupt discontinuity of lithological units has been observed across the superlineament. Besides these, drag like structures have also developed. Geomorphologically, the major part of the lineament is occu-