A NOTE ON THE ORIGIN OF TRIKUTA DOLOMITES OF JAMMU (J AND K STATE)

SATISH KUMAR CHADHA
Department of Geology
Govt. G.M. Science College, Jammu, India

Introduction

THE present investigation pertains to the mechanism of dolomitisation of the lower part of the Trikuta Limestones of Jammu. The area, falls between Lat. 33° 01′ 15″ to 33° 10′ N and Long. 75° 01′ 25″ to 74° 50′ E. For the first time an attempt is made to explain the mode of origin, depositional environment and configuration of the basin, in which the sediments were deposited.

Geological Set up

The Trikuta Limestone Formation occurs in the form of inliers and of which, the biggest one is the Reasi (Lat. 33° 41′ N: Long. 74° 50′ E) inlier. The Trikuta Limestones are juxtaposed against the Siwaliks due to tectonic disturbances (Fig. 1). The base of the formation is not seen anywhere and it is unconformably overlain by the Subathus (of Eocene age).

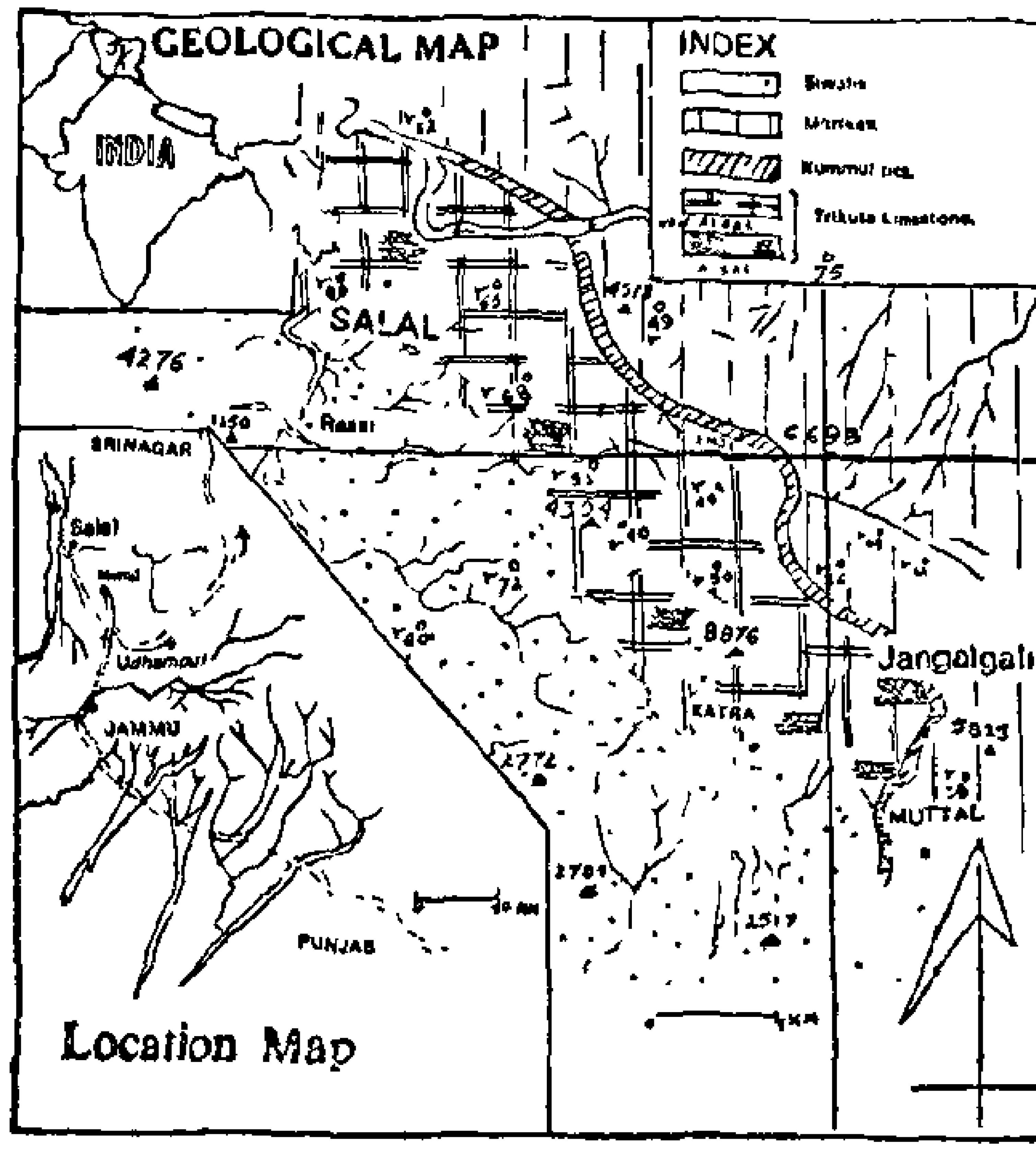

FIG. 1. Geological set up of the area.

Description of the Dolomite

The dolomite of the Reasi area is grey, fine to coarse grained, massive rock and shows ablong or ovate markings on the weathered portions. Faint to well developed algal structures appearing either in the form of various laminated bands or stromatolitic (Fig. 2) nodules of varying shapes and sizes are generally present. Bedding planes are altogether missing. Within the dolomite bodies are found drusy cavities with calcite, stylolites and quartz veins. Thin section petrography has revealed several rock types, *e.g.*, saccharoidal dolostone, pellet dolostone, oolitic dolostone (Fig. 3), algal dolostone, highly cherty dolostone, etc. (Chadha[1]). Within the saccharoidal dolostones are present sub-types such as " Birds' eye dolostones ", " Stylolitic dolostone " and " Veined dolostone " (Fig. 4).

Mode of Origin

From the observations made relating to dolomitisation, it has been found that the lower part of the Trikuta Formation is all dolomitic material and no evidence of any replacement found anywhere. In spite of best efforts no remnants of original limestone has been recorded. The presence of oolites, stromatolites and Bird's Eye texture (Shin[2]) and also the presence of desiccation cracks give an indication of supratidal environment under which these have been formed. Even in this environment, we find a fairly widely ranging hydrodynamic energy conditions, as reflected in the considerable variety of composition, texture and structure etc. But no such gradations have been observed in the study area. If considered syngenetic (or penecontemporaneous) formed under Sabkha (inter-tidal) environment in which supersaline water replaced the original limestone with higher values of pH, Eh and CO_3 ionic concentration then it is difficult to account for the complete absence of "red beds and anhydrites " in the area and also the association of siliceous and calcareous shales with biostromes. The idea of evaporitic character of dolomites is also untenable on account of the absence of gypsum with dolomites. The same difficulty crops up if we consider them a " Bahama Type " deposit. In this environment too, oolitic and pelletic materials are found alongwith the coralgal reef type deposits, which are completely missing in the area, although the presence of stromatolites, oolites, pellets, etc., reveals a very close similarity.

The dolomites of the area appear to have been formed in an environment similar to that of the Coorong area of South Australia. This region abounds in ephermal lagoons (or palayas) in which varied group of carbonate sediments accumulate. An interesting part of this environment is that among various minerals like dolomite, calcian dolomite, magnesian calcite and other minerals like magnesite and hydro-magnesite, are also deposited although their exact mode of formation is not yet very clear. This environment differs in many important and

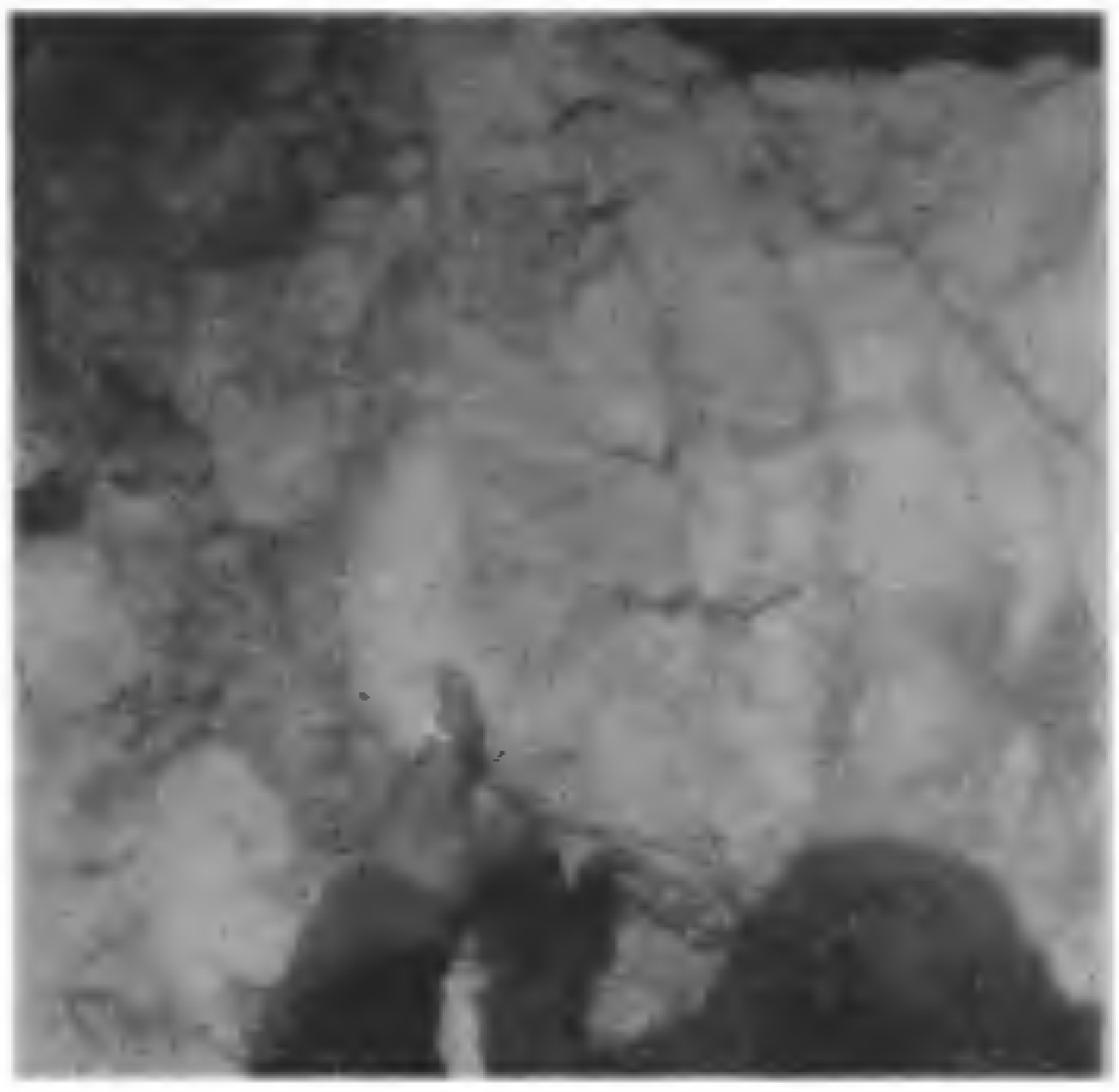

FIG. 2

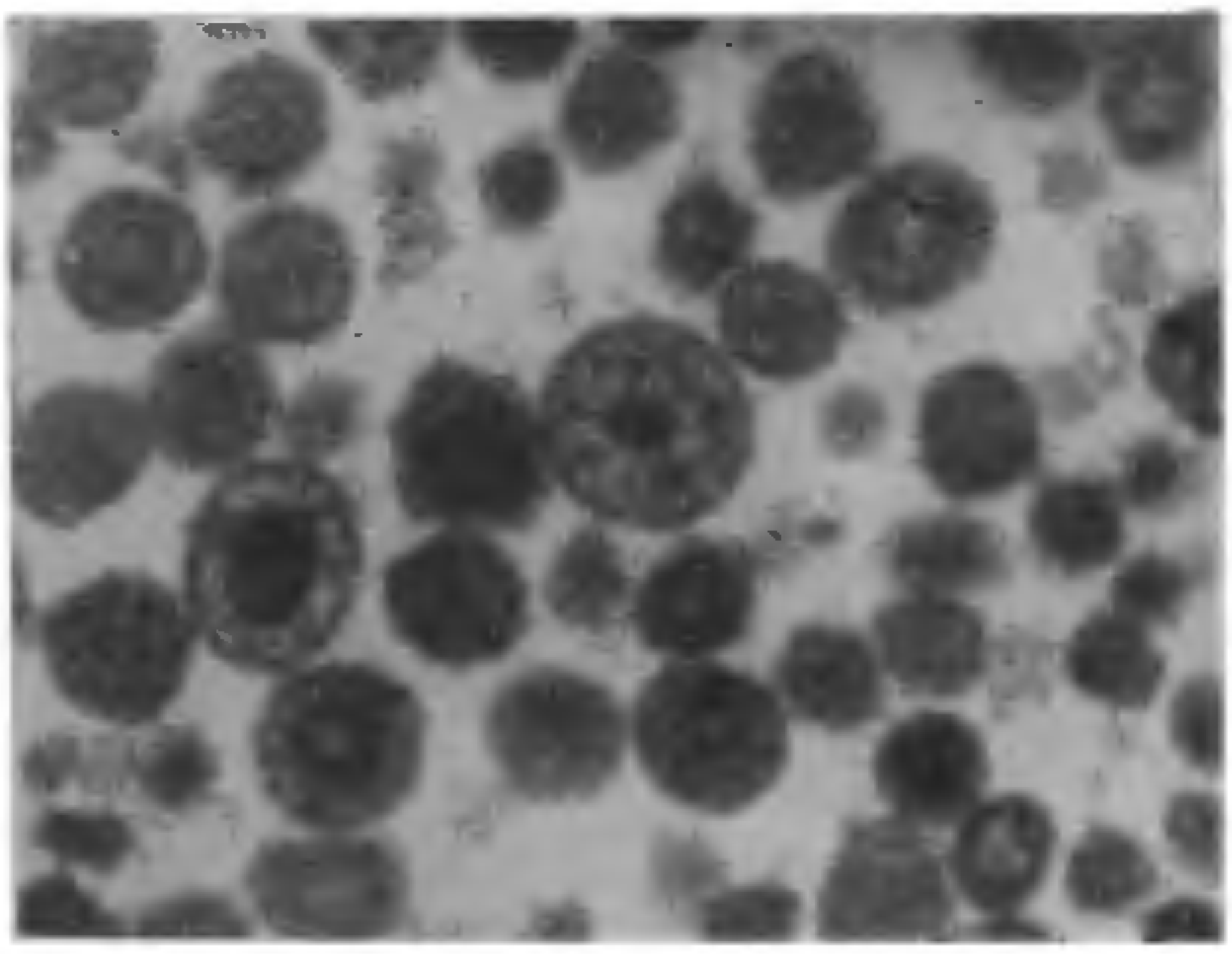

FIG. 3

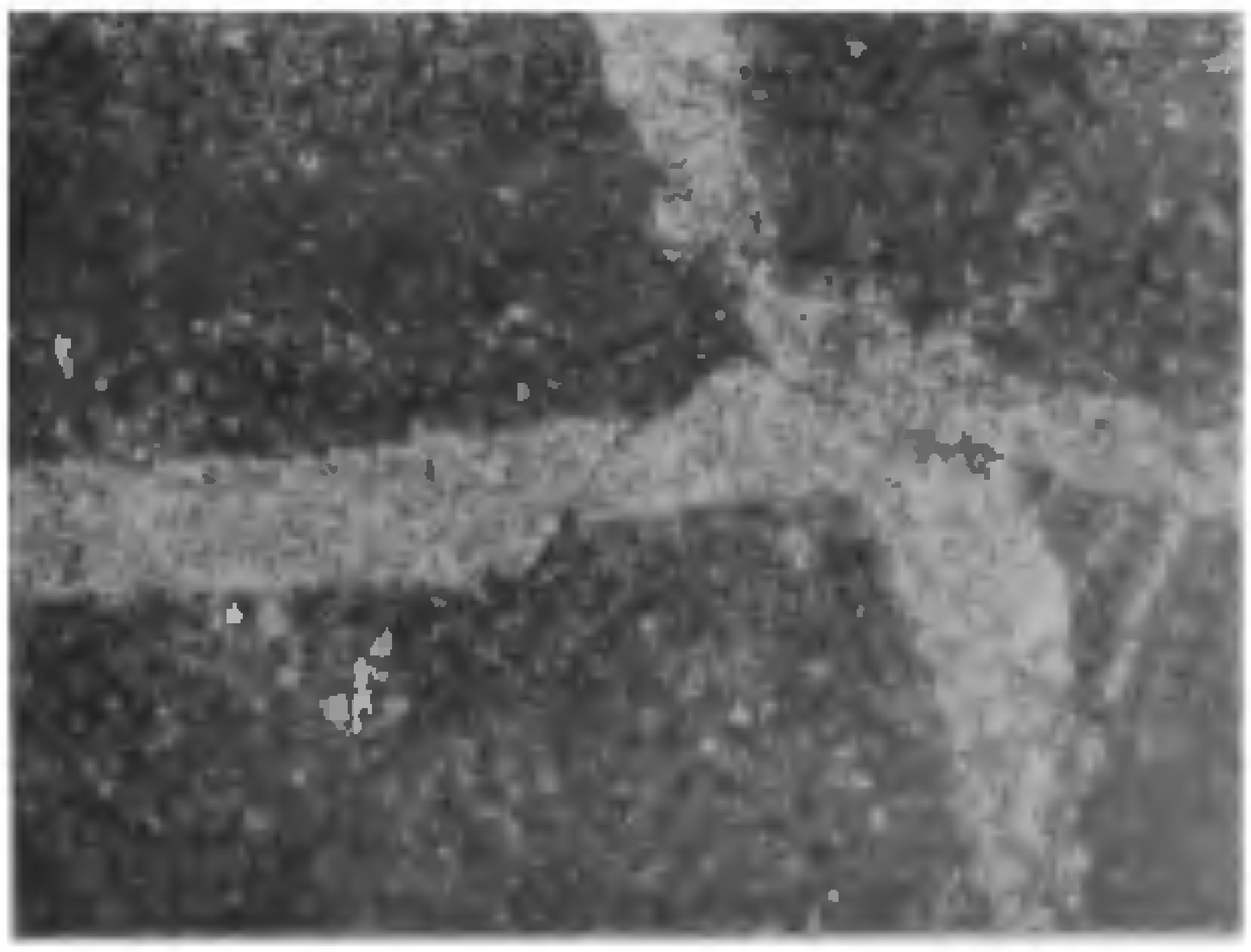

FIG. 4

interesting ways from that of the Sabkha type deposits of the Persian Gulf.

Thus, the overall depositional picture appears to be a near shore, shallow, uneven basin, which was divided into many partly or completely isolated smaller sub-basins. Depositional environments under such conditions would show large variations. The isolated "Starved" sub-basins would be marked by low pH, Eh and slow rate of sedimentation. On the other hand, higher values of pH, Eh and CO_3 ionic concentration would prevail in the shallow, partly connected or closed sub-basins.

The author is highly thankful to the U.G.C., New Delhi, for providing financial assistance to conduct the fieldwork in the area of present research project.

March 5, 1981.

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2. Shin, E. A., "Practical Significance of Bird's Eye Structure in Carbonate Rocks," *Journ. Sed. Petrol.*, 1968, 38, 215.

A SYNCOTYLOUS SEEDLING OF *CARTHAMUS TINCTORIUS* LINN.

AMBUJA PILLAI AND SURESH C. GOYAL
Department of Botany, University of Rajasthan
Jaipur 302 004, India

IN a population of about 1,500 seedlings, 0·13% showed syncotyly, the single cotyledon having a distal furrow extending to about 1/3 its length (Fig. 1). The seedling vasculature is traced from the root to the epicotyl; and all measurements have reference to this.

The primary root is diarch as in the dicotylous seedlings with a central core of xylem flanked by two phloem groups. At 3·75 mm level, the metaxylem shows a furrow on one side occupied by parenchyma (Fig. 2). An arc of the cells resembling those of the cambium appears inside each phloem group at 4·35 mm. At 7·5 mm a narrow parenchymatous pith is established, encircled by three groups of xylem A, B_1 and B_2 and the two laterally extended phloem arches (Fig. 3). A is larger and B_1 and B_2 have resulted from splitting of metaxylem. The cells cut by those resembling the cambial initials centripetally differentiate into xylem. Side by side with the above changes the xylem group A divides into three, a central endarch collateral bundle A, flanked by two xylem groups A_1 and A_2 still united to B_1 and B_2 at the protoxylem poles (Fig. 4). This is followed by the division of the phloem into three groups, two outside A, A_1 and A_2 and the third large, arc-shaped patch outer to B_1 and B_2 (Fig. 4).