

of a pellet rock, and Fig. 2 presents microcrystalline quartz in a chert band going into chalcedonic quartz wherein the quartz units are elongated and broad, like dogtooth spar.



FIG. 1. Microphotograph of a quartz pool occurring as a pore-filling cement in a pelletoid rock of Sirban Limestone of Raisi, J and K State. Note lutecite along the periphery of the pool gradually giving place to megaquartz at the centre. Crossed nicols,  $\times 45$ .



FIG. 2. Microphotograph of a chert band giving place to quartzine towards the top. Note quartzine units are elongated and somewhat stout. Cross nicols,  $\times 45$ .

Optically there are two kinds of chalcedony, length fast, that is the fast ray coinciding with the 'C' crystallographic axis of the grain, and length slow where the slow ray coincides with the 'C' crystallographic axis of the grain; here the mineral is called quartzine. Lutecite is a chalcedonic quartz where the slow ray makes an angle of  $30^\circ$  with the crystallographic "C" axis of the grain. Folk and Pittman (1971) give an extensive discussion of the occurrence of quartzine and lutecite in carbonate rocks and make out a point that they invariably represent the replacement of original alkaline and sulphate minerals and thus suggest, evaporite, sabkha or playa lake environment even though where any direct evidence as to the occurrence of evaporitic minerals is not available. Quartzine and lutecite represent replacement of original evaporitic minerals. With this point in view, the author made a thorough search for quartzine and lutecite in the chert

occurrences of the Sirban Limestone of Raisi. To his surprise, he found many bands and pools of chert showing the occurrence of these two minerals. Figure 1 exhibits a pool of silica occurring as a pore-filling cement. Here lutecite gradually gives place to centrally disposed megaquartz. Figure 2 is of a chert band where microcrystalline quartz is gradually giving place to quartzine. The crystals are elongated and stout, so characteristic of quartzine occurrences (Folk and Pittman *op. cit.*). Rao and Khan (*op. cit.*) documented many evidences in favour of sabkha origin of the dolomites of Raisi. May be the occurrence of lutecite and quartzine above reported represent the replacement of original sulphate minerals, even though no direct evidence as to their presence in the Sirban Limestone of Raisi is now registered. Then one may regard that the occurrence of quartzine and lutecite in Sirban Limestone of Raisi adds further evidence in support of the earlier conclusions of Rao and Khan (1970) that these rocks are of sabkha origin.

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#### SIGNIFICANCE OF THE DEVELOPING VERTEBRAL COLUMN OF *PELODYTES* *PUNCTATUS* TADPOLE

OF all vertebrates, the Anura have the shortest vertebral column; it consists of not more than nine free vertebrae and a rigid bony rod, the urostyle or os-coccygeum, representing the post-sacral vertebrae. That the urostyle is formed of fused post-sacral vertebrae is indicated in the adult by nerve aperture and sometimes, as neural arches anteriorly.

*Pelodytes* tadpoles were collected in Georgia (USSR) and fixed in Bouin's fluid and preserved in 70% alcohol. This material was brought to India by Prof. L. S. Ramaswami with a view to compare the development of the vertebral column in *Pelodytes* with that of Indian species. He placed the material unreservedly at my disposal. Sections were cut  $6\mu$  after routine paraffin embedding. On