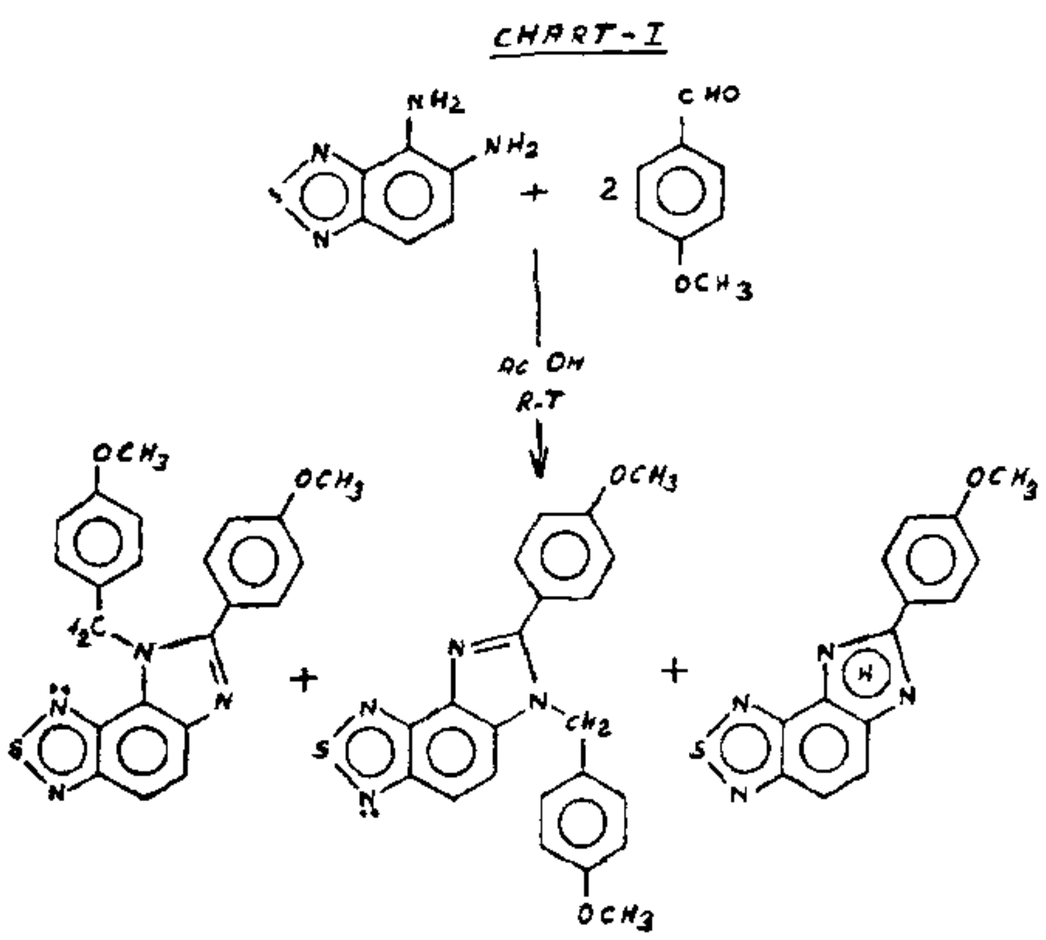
CONDENSATION OF 2,1,3-BENZOTHIADIAZOLE-4,5-DIAMINE WITH *p*-ANISALDEHYDE

2,1,3-Benzothiadiazole-4,5-diamine prepared by a modified procedure of Pesin and co-workers[1,2] has been condensed with *p*-anisaldehyde in 1 : 2 molar proportions, at room temperature in acetic acid medium for the first time. The reaction mixture on processing over a column, yielded three crystalline products, A (m.p. = 148°), B. (m.p. = 145°) and C (m.p. = 251°).

CHART-I



I II III

I.R. spectra of the compounds A and B showed no absorptions assignable to –NH, $-NH_2$ or carbonyl functions. The molecular weight from mass spectra (M^+ at m/e, 402) and the elemental analysis of A and B showed that both of these compounds are isomeric 1 : 2 reaction products of molecular formulae $C_{22}H_{18}N_4O_2S$. The NMR spectrum (CS_2) of compound A revealed signals at δ 3·85 (S, 3H, OCH_3), 4·0 (S, 3H, OCH_3), 6·1 (S, 2H, $>N-\underline{CH_2}Ar$) and δ 7·5 (m, 10H, aromatic protons). The corresponding spectrum of B showed the signals at δ 3·90 (S, 3H, OCH_3), 3·98 (S, 3H, OCH_3), 5·6 (S, 2H, $>N-\underline{CH_2}Ar$) and δ 7·3 (m, 10H, aromatic protons). Based on these, spectral and analytical data and on analogy with *o*-diamine-aldehyde reaction products[3], compounds A and B have been characterised as isomeric 1-(*p*-methoxybenzyl)-2-(*p*-methoxyphenyl) benzimidazolothiadiazoles. Compound A was assigned 1-(*p*-methoxybenzyl)-2-(*p*-methoxyphenyl) benzimidazolo (6,7-d)-2,1,3-thiadiazole (I) structure, based on the relatively downfield absorption of methylene protons (δ 6·1) in NMR spectrum. The downfield shift of methylene protons may be explained on the basis of the interaction of these protons with the lone pair on Nitrogen of the thiadiazole moiety. Compound B was assigned 1-(*p*-methoxybenzyl)-2-(*p*-methoxyphenyl) benzimidazolo-(4,5-d)-2,1,3-thiadiazole (II) structure.

I.R. spectrum of the compound C showed broad absorption at 3600–2600 cm^{-1} assignable to –NH function. The molecular weight from mass spectrum (M^+ at m/e, 282) and elemental analysis of C indicated that it is a 1 : 1 reaction product having $C_{14}H_{10}N_4OS$ as the molecular formula. Its NMR spectrum (D_6, DMSO) showed signals at δ 3·85 (S, 3H, OCH_3) and δ 7·6 (m, 6H, aromatic protons). Based on these data, C has been characterised as 2-(*p*-methoxyphenyl) benzimidazolo (4,5-d)-2,1,3-thiadiazole(III).

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PSEUDO-MUDCRACKS AND SAND POLYGONS IN THE UDAIPUR FLYSCH, RAJASTHAN, INDIA

THE interstratified sequence of meta-greywackes and phyllites of the Aravalli Supergroup, developed in the area around Udaipur, has been recognised as Precambrian flysch by R. K. Mathur (unpublished G.S.I. Report, 1964), Pandya[1], Poddar and Mathur[2] and Damle and Sharma[3]. The bedding characters, external form, internal organisation and bedding plane irregularities seen in this sequence are suggestive of a flysch environment of deposition, in a tectonically unstable geosynclinal setting. However, the presence of mud-cracks in this sequence, as reported by Damle and Sharma[3] provide the only inconsistency with the depositional environment of the flysch. This necessitated re-examination of these structures. The study reveals that these structures are not true mud-cracks but resemble pseudo-mudcracks and sand polygons as described by Dzulynski and Walton[4].

Pseudo-mudcracks and sand polygons are well seen along the road section near the main gate of Rana Pratap Memorial on the eastern bank of lake Fatehsagar near Udaipur city, where the dykelets of sand consisting of grains of quartz cemented by ankerite, occupy the cracks developed in the pelitic layers, which,

in plan, exhibit polygonal shapes, measuring from 5 cm to 15 cm across (Fig. 1). These dykelets

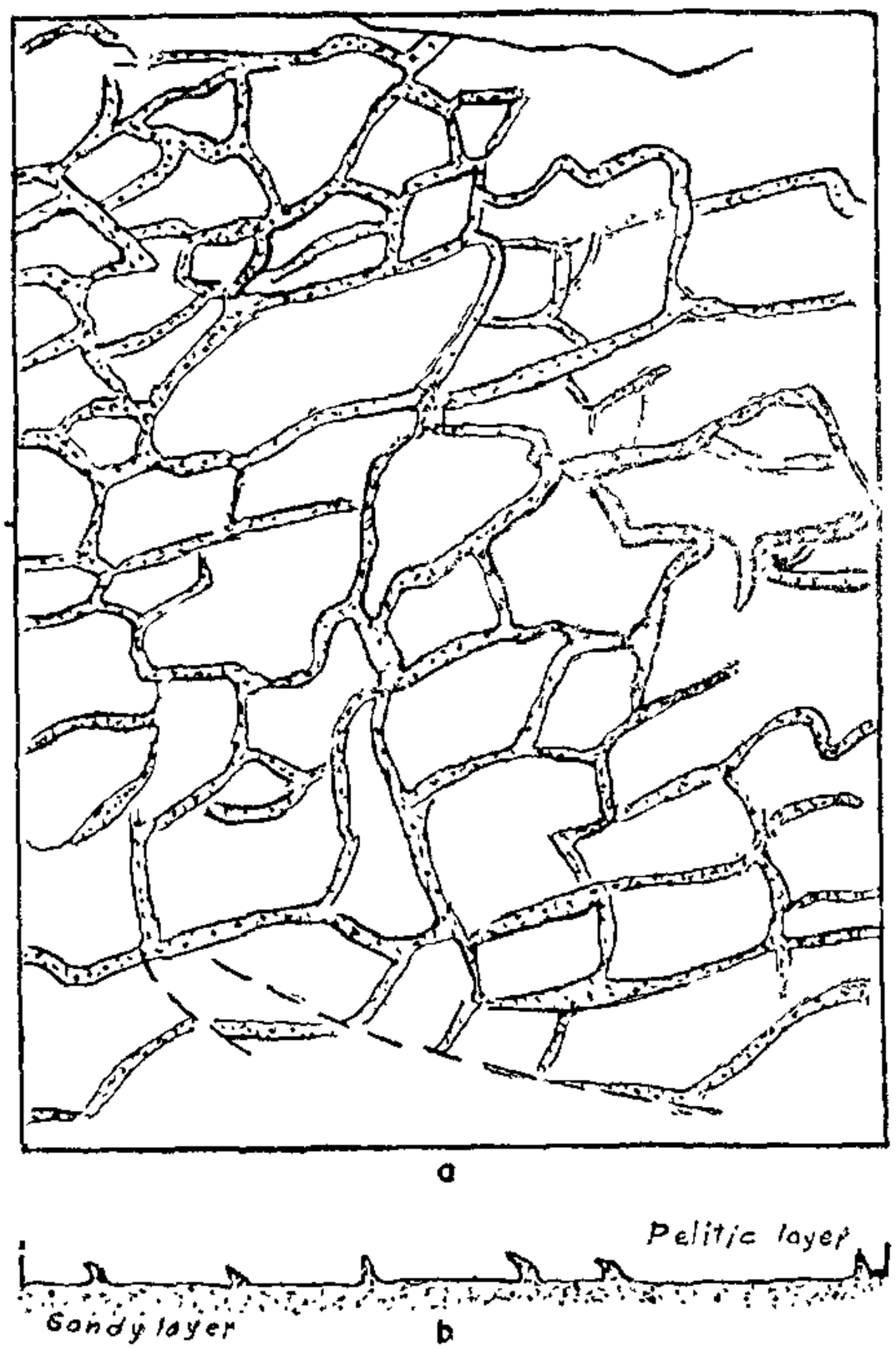

FIG. 1. Sand polygons in plan (*a*) and Section (*b*). Scale : 1 cm = 5 m. app.

punctuate the lithological homogeneity and stratification of the pelitic layers, providing superficial resemblance to mudcracks. The sand dykelets are in structural disharmony to the stratification and compositionally resemble the sandy layers lying below the pelitic layers, suggesting that these dykelets are part of the same sedimentary sequence. The sandy layer occurs below the pelitic layer at outcrop level in the normal order of superposition. Sand polygons are common towards the lower bedding plane of the pelitic layer. In the true mudcracks, formed by desiccation, the development of cracks is vertical to the bedding plane and the fractures open towards the top. In the structures under discussion, the fractures are opening towards the bottom and the sandy material is seen cutting across the bedding plane in the pelitic layers at angles varying from 20° to 40° and at places vertical.

Dzulynski and Walton[4] have considered the development of pseudo-mudcracks and sand polygons as due to the expansion of liquified sandy layer horizontally, without comparable expansion in the fine grained pelitic layer. This differential expansion would lead to the development of polygonal tension cracks in the fine grained layer. The liquification of the sandy layer may possibly be attributed to seismic shocks in the tectonically unstable depositional environment of the Aravalli Supergroup[5]. The polygonal fractures in the fine grained layers would be filled up by the injection of the sand material from the underlying sandy layer under super-incumbent load.

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STUDY OF THE KARYOTYPE, REPORT OF B-CHROMOSOMES AND POLYTENE CHROMOSOMES IN *PHASEOLUS AUREUS* ROXB.

INITIAL report on somatic chromosome behaviour in *Phaseolus aureus* Roxb. has been published already[1]. In the present note some detailed account on this aspect is described. Perusal of literature[2,3] reveals that the karyotype study in this taxon is not satisfactory. This may be due to smallness of chromosomes, their more or less similar size and lack of suitable pretreatment schedule to reveal the constrictions of individual chromosomes. Moreover, the B-chromosomes and polytene chromosomes are found in the root tip meristem and its adjoining areas following a special methodology of chromosome preparations.

For a critical study of the karyotype, different pretreating chemicals were used, among which saturated solution of α-bromonaphthalene for 3 hours at 6° C was found suitable. Healthy young roots were taken from the seedlings of *Ph. aureus*. Fixation was done in acetic acid and alcohol mixture (1 : 3) for