value for the absorbance which, however, increased gradually with time and reached a constant value after 40 minutes and remained stable for more than 12 hours.

Although extraction of palladium was possible from dilute nitric acid (0·05 N to 0·5 N), the absorbance values of the extract decrease with an increasing acidity beyond 0·15 N. Maximum absorbance was obtained for the extract when the acid strength was 0·05 N to 0·15 N. The acid concentration in the aqueous layer was, therefore, maintained at 0·1 N.

A 1% alcoholic solution of the reagent was found to be most suited for the determination. When the reagent concentration exceeds 1%, there is significant absorption at 610 nm. This is not the case when the reagent concentration is $\leqslant$ 1%. Thus the absorbance values measured against the reagent blank do not differ from those measured against the pure solvent. Further the solution of the reagent in the solvent itself requires more than 24 hours time for the attainment of stability of the colour of the complex.

An examination of the effect of other ions revealed that iron (III), cobalt (III), nickel (II), platinum (IV), copper (II), silver (I), gold (III), zinc (II), cadmium (II), mercury (II), chromium (III), chromium (VI), molybdenum (VI), tungsten (VI), vanadium (V) and manganese (VII) when present in almost equal amounts with palladium did not interfere and a good recovery of palladium (within 4% error at μg level) was achieved. However, molybdenum (VI), vanadium (V), iron (III) and chromium (VI) when present in higher amounts interfered. Amongst the anions iodide, cyanide and thiocyanate interfered seriously when present even in very small amounts, whereas the chloride, bromide, fluoride, oxalate, sulphate and nitrate did not interfere even when present in excess.

Thus the method is simple and rapid and yet provides a good recovery of palladium in trace concentrations in presence of most of the common metal ions.

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TRANSFORMATION OF PLAGIOCLASE

A THIN pinkish aplite vein, varying from 3″ to 6″ in thickness, has been found cutting across both granite and dolerite at Ramapuram temple in the Mid-Pennar Reservoir project area in Anantapur District, Andhra Pradesh (Survey of India, Toposheet No. 57 F/5). The aplite is a compact vein in the granite but, as it enters the dolerite, changes its pattern into shreds and veinlets. As the dolerite is jointed, thin veinlets branching off from the vein, project themselves along with the joint planes of the dolerite.

Granite often contains two types of plagioclase of which one is the most commonly occurring, more basic oligoclase-andesine variety while the other is albite which generally occurs as rims and granules. The origin of such albite in granitic rocks has been discussed by earlier investigators (Rogers, 1961 ; Ramberg, 1962). Microscopic examination of the aplite has revealed evidence of decalcification of plagioclase and soda metasomatism with attendant development of albite.

The aplite consists of micropegmatite (67·2%), quartz (6·8%), basic plagioclase (6·9%), albite (3·0%), epidote (5·4%), alteration materials (sericitic and clayey products) (8·0%), opaque ore (1·8%), and chlorite (0·9%). The most striking feature of the thin sections of this rock is the presence of a highly turbid, nearly opaque plagioclase surrounded by a mantle of fresh twinned albite [maximum extinction : 16·5° $\perp$ (010)] which in turn is partially surrounded by a chain of epidote grains (Figs. 1–3). These grains are variegated with tints in light green or light yellow. Some grains are feebly pleochroic while some are non-pleochroic.

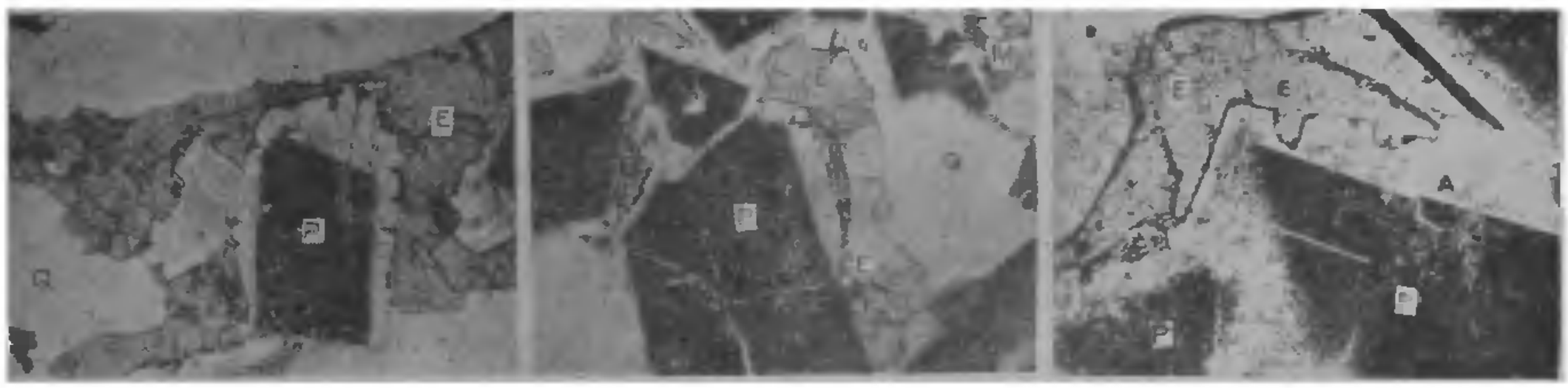
The writer believes that the formation of epidote and albite rims must have taken the following course :

Most of the compounds of Na_2O–CaO–SiO_2 are unstable and exist without dissociation only through a small range of temperature (Morey and Bowen, 1925). Earlier workers (Lyons, 1955 ; Fyfe *et al.,* 1958 ; Waard, 1959) have observed a gap in composition between albite and oligoclase. The more Ca-rich phase of the plagioclase is unstable in the presence of water and excess CaO, and the reaction : Calcic plagioclase $\rightleftharpoons$ albite + epidote, is favoured

when the temperature reaches a point at which the velocity of the reaction attains a geologically finite rate (Deer *et al.*, 1963, p. 150). In this transformation, Ca and Al of plagioclase are released to enter the lattice of epidote.

$$CaNaAl_3Si_5O_{16} + Na^{+} + Si^{+4} \longrightarrow 2NaAlSi_3O_8 + Ca^{+2} + Al^{+3}.$$

It has been experimentally demonstrated (Eskola *et al.*, 1935) that in this reaction, the formation of albite from more basic plagioclase takes place without any appreciable change in volume which is evident in Figs. 1–3. Decalcification of more basic plagioclase and the consequent development of albite rim has also been suggested by Dietrich (1962) and Prasad (1968).



1 2 3

FIGS. 1–3. Decalcification of more basic plagioclase into albite rim and epidote. P, More basic plagioclase ; A, Albite ; E, Epidote ; Q, Quartz ; M, Micropegmatite. Fig. 1. (× 40), Fig. 2 (× 70) and Fig. 3. (× 100). Infiltration of quartz and albite through cracks in the more basic plagioclase due to which the grain is also frayed in the upper part (Fig. 2). The cleavages in the more basic plagioclase are emphasized by such infiltration.

The basic plagioclase also appears to be affected by soda metasomatism involving the fixation of Na and Si. Figures 2 and 3 reveal the infiltration of Na and Si, in the form of albite and quartz, through the cracks and cleavages in the more basic plagioclase.

Bowen (1928, p. 186) states that a slight decrease in the temperature, during the crystallisation of a plagioclase mixture, results in the reaction : Plagioclase + liquid = a little more plagioclase of somewhat more sodic composition. Vance (1965, p. 643) similarly argues that a superheated more albitic melt, by mixing with a cooler and more anorthitic material, could lead to partial resorption of plagioclase crystals in the latter and, on cooling, precipitation of some sodic plagioclase.

The observations made in this study are in accord with the statement that plagioclases in the range of composition An_{1-5} to An_{21-25} are sometimes divided into sodium-rich and calcium-rich regions (Deer *et al.*, 1963, p. 96 and pp. 104–105).

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OCCURRENCE OF STROMATOLITES FROM THE GREAT LIMESTONE OF MUTTAL, UDHAMPUR DISTRICT, JAMMU PROVINCE, J AND K STATE, INDIA

THE present note records the occurrence of stromatolites from the dolomitic limestones of Muttal (32° 59′ N : 75° 02′ E), at a place across the Do-Khadda bridge. It lies on Survey of India Toposheet No. 43 P/1. It is connected by a 16 km long branch road from Tikri (32° 56′ 30″ N : 74° 57′ E), about 45 km from Jammu on the National highway to Kashmir.