

### Determination of Atebrin in Urine by the Pulfrich Photometer.

THE Zeiss Pulfrich Photometer has been employed for the estimation of atebrin in urine. The absorption curve of a 0.02 per cent. solution of atebrin in N/10 HCl is determined by a series of measurements of transmission, employing all spectral filters in succession. The absorption has been found to be maximum with S/43. This filter has been used for the measurement of the extinction co-efficient. The concentration of the solution was found proportional to the extinction coefficient and the Lambert-Beer absorption law is valid, obviating the necessity for the calibration curves. The conversion factor for obtaining the concentration of atebrin in mgms. per 100 c.c. from the observed extinction co-efficient is 5.49.

An accurately weighed amount of atebrin was added to 200 c.c. urine. The urine was extracted for atebrin by the method of Tropp and Weise,<sup>1</sup> the final acid extract, thus obtained, was made upto 100 cc. and the extinction coefficient was determined in the Photometer, using a cell of stratum thickness of 1 mm. The concentration of atebrin was obtained by multiplying the extinction co-efficient by the factor 5.49.

The accuracy may be judged by the following results obtained in our experiments :

Atebrin added	Atebrin found	Percentage error
29.3 mg./100 c.c.	28.7 mg./100 c.c.	2.05
12.2 mg./100 c.c.	11.9 mg./100 c.c.	2.54

This is a much quicker method than the colorimetric method usually employed for such determinations. This method further obviates the necessity for preparing standard solutions for every determination.

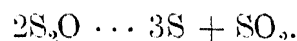
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<sup>1</sup> Tropp and Weise, *Arch. Exp. Path. u. Pharmak.*, 1933, 170, 339.

### Disulphur Oxide.

At the recent session of the Indian Science Congress, Calcutta, I pointed out that disulphur oxide (S<sub>2</sub>O) appears to be the primary product of the hydrolysis of sulphur chloride. Since then further work has been done in this laboratory to prove the existence of disulphur oxide in the yellow solution obtained when sulphur monoxide is passed into dry carbon tetrachloride kept at -12° C. I now have conclusive experimental evidence to show that disulphur oxide does exist. The oxide in carbon tetrachloride solution, reacts with dilute caustic soda producing the sulphide and the sulphite of sodium in equimolecular proportions. It decomposes fairly rapidly into sulphur and sulphurdioxide.



The oxide (in carbon tetrachloride solution) is more stable in presence of dry hydrogen chloride.

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### The Colour of the Blue Quartz of the Charnockites of South India and of the Opalescent Quartz-Gneiss of Mysore.

HOLLAND<sup>1</sup> investigated the greyish blue charnockite quartz of South India and observed the presence of acicular inclusions which he considered to be rutile. He reported that the colour of the quartz was probably due to those inclusions but he does not appear to have either isolated the inclusions or carried out a chemical investigation of the quartz specimens.

Specimens of the charnockite quartz with varying intensity of blue colour as well as of blue quartz from the opalescent quartz-gneiss of Kadur District (Mysore) were examined in the course of this work, both microscopically and chemically. The colour of these quartzes which is of a yellowish tone by transmitted light and blue by reflected light was found to be greatly affected by heating the charnockite quartz losing its colour completely even at 300°.

Thin sections of these quartzes show under the microscope a large number of inclusions which can be classified under two heads,

(a) regularly arranged acicular inclusions (*Microphotograph 1*) and (b) the more or less drop-like and dust-like inclusions which show large variations in size and are often arranged similar to chains of beads (*Microphotograph 2*). The quartz grains appear under the microscope to be built up of many crystal grains in different orientations, and also exhibit wavy extinction. The acicular inclusions often extend into adjacent fragments of the quartz in unbroken continuity thereby indicating either a secondary origin or a secondary arrangement.

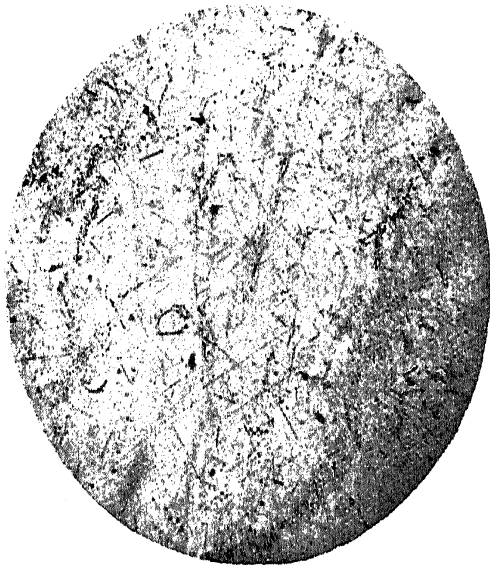


Fig. 1.

Blue quartz "B" with the acicular and dust-like inclusions—in transmitted light.  $\times 200$



Fig. 2.

Blue quartz "B" with the dust-like and drop-like inclusions—in transmitted light.  $\times 600$

All the coloured quartzes show under the microscope a pale brownish-yellow turbidity,

the intensity of which was found to vary with the intensity of the blue colour in the specimens. This turbidity is destroyed by heat in the same way as the blue colour.

This brownish-yellow turbidity was not noticeable in the colourless quartz from Pallavaram (Madras) obtained close to the charnockite masses, and which also contained acicular inclusions similar to those in the blue quartz. Another colourless quartz obtained from Bodi-Charnockite (Madura) contained drop-like and dust-like inclusions, but did not reveal the presence either of acicular inclusions or of the brownish-yellow turbid medium. These observations show that neither of these kinds of inclusions is responsible for the blue colour, and that the brownish-yellow turbid medium is observed only in the coloured specimens and not in others.

Boiling with hydrochloric acid freed the crushed specimens from the iron present as an impurity, but since the blue colour of the specimen persisted even after this treatment, it is evident that iron compounds do not contribute to the colour of the specimen.

The acicular inclusions were separated from the quartz by the method recently proposed by Postelmann<sup>2</sup> and were found to be very fine needles of rutile. Chemical analysis revealed that all the quartzes examined contained significant amounts of titanium, the titanium contents of the specimens being proportional to the depth of colour.

The quantity of rutile present in the specimens was estimated microscopically and found to be roughly the same even in specimens of different intensities of colour. Since chemical analyses revealed, however, that the intensity of colour was proportional to the titanium content of the specimen, it follows that the specimens contained titanium not only as rutile but also in some other non-crystalline form. This deduction is justified by the discovery of (1) the brownish-yellow turbid medium referred to already in all the coloured specimens, (2) the destruction of this turbidity and the accompanying loss of colour on heating.

It can therefore be stated in conclusion that the colour of the specimens of quartz examined appears to be due almost entirely to the existence of a brownish-yellow turbid medium, which contains titanium

in a colloidal condition. Further work on this problem is in progress and full details will be published elsewhere.

The author wishes to thank Dr. K. R. Krishnaswami for his keen interest in the work.

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<sup>1</sup> *Mem. Geol. Surv. India*, 1900, 28, 2.

<sup>2</sup> *Neues Jb. Mineral. Geol. Palaeont.*, 1937, Bd. 72, Abt. A, 401.

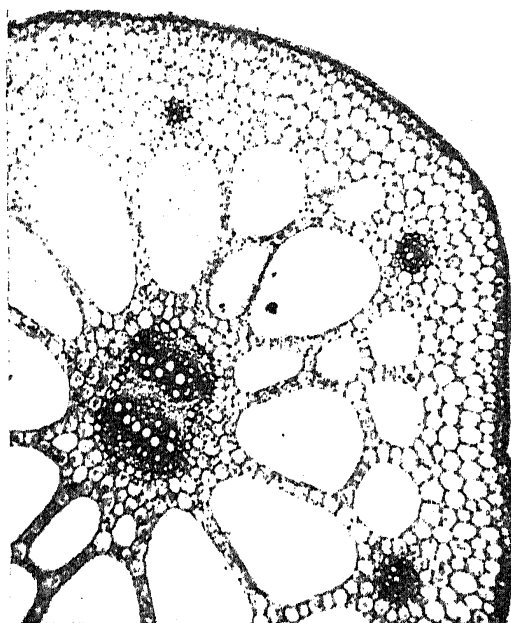
### A Preliminary Note on Polystely in *Limnanthemum cristatum* and *Ottelia alismoides*.

*Limnanthemum cristatum* is an aquatic herb common in fresh-water jhils, ponds, e.c., all over Bengal. Its shoot morphology has been studied by d' Almeida.<sup>1</sup> Polystely occurs in the cortical region of the stolons and in the petioles of the leaves arising on the stolons. The stolons, but for their axillary position, the inflorescence borne on them, the short-petioled floating leaf and the absence of a pair of stipules at the base, very much resemble the long-petioled floating leaves. It belongs to the N. O. Gentianaceæ.

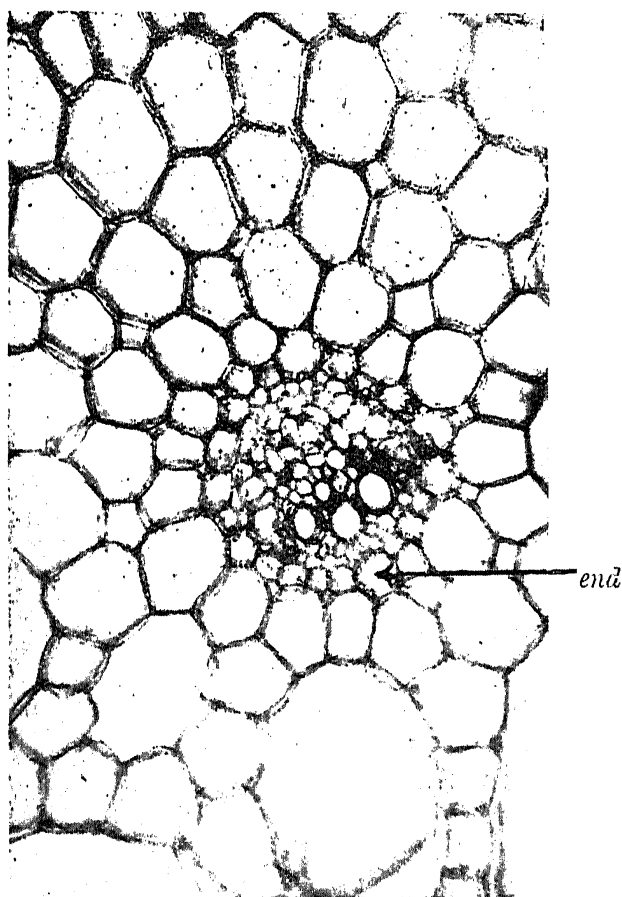
*Ottelia alismoides* is also an aquatic herb very common in fresh-water jhils, ponds, etc., in Bengal. Its submerged leaves are narrow but the floating leaves are long-petioled, ovate-lanceolate, oblong or cordate. The peduncles are also elongated. All the bundles of the peduncle and the leaf-stalk are individual steles. It belongs to N. O. Hydrocharitaceæ.

The cortical steles of *Limnanthemum* have each an endodermis surrounding it without a clearly distinguishable pericycle, while the steles of *Ottelia* have both endodermis and pericycle surrounding each of them. The endodermal cells in the former case have well-developed Casparian strips (made out with phloroglucin and hydrochloric acid), and in both the cases they are characterized by the presence of falling starch grains.

The question now arises: Should we call these discrete vascular bundles, steles? Solereder<sup>2</sup> has described these structures in



A



B

*Limnanthemum cristatum*. A—photomicrograph of a *t. s.* of stem, showing central and cortical steles; B—that of a cortical stele magnified. *end*, starch-sheath with Casparian strips.

a *Limnanthemum* spp. as a ring of isolated vascular bundles surrounded by starch sheath. Similar bundles in *Leiphaimos* have been described by Johow<sup>3</sup> as 'perhaps of the nature of steles'.