

secondary growth. An almost similar condition is known to exist in *Podophyllum peltatum*.

So far as I know, such a behaviour has not been recorded before in the family Urticaceæ. A detailed investigation is in progress and the results will be published elsewhere.

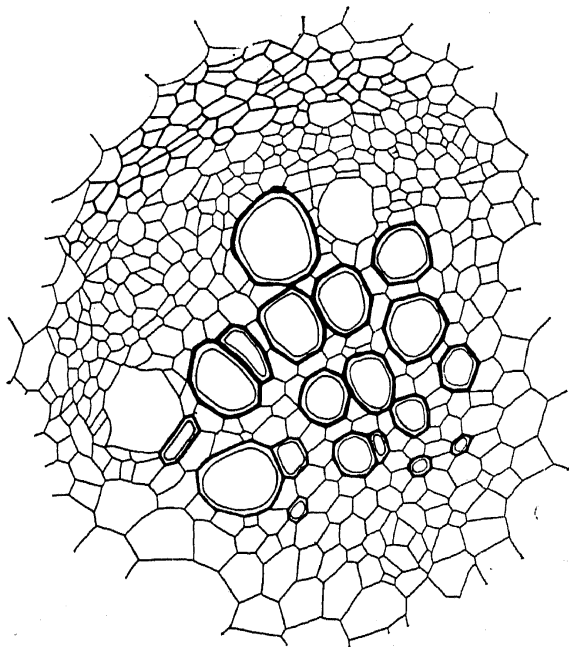


Fig. 2.

The figures were drawn at my request by one of my students Mr. Bahadur Singh, M.Sc.

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3rd April, 1933.

#### The Raman Effect of Fused Inorganic Nitrates.

THE Raman Effect of inorganic nitrates in solution and as powdered crystals has been studied by a number of investigators and the normal vibration frequencies of the  $\text{NO}_3$  ion, theoretically calculable from a plane equilateral triangular model, are known to be present in the scattered spectrum of these compounds. It is also well known that these free ionic frequencies are modified to a certain extent by the physical state in which the substance is studied. For example, in crystals these frequencies have higher values than in solutions. It will be interesting to study how far the fused state of the substance affects these natural frequencies. With this purpose in view we

have investigated a number of inorganic nitrates (whose melting points are below  $600^\circ\text{C}$ ) in which the Raman spectra are obtained with the substance maintained in a molten condition in a specially constructed electrical furnace. The full report of the investigation is in course of publication and we give below the results obtained with sodium and potassium nitrates only.

	Solution	Crystal	Fused salt
$\text{NaNO}_3$	725	720	715
	1048	1066	1054
	1361	1383	1393
$\text{KNO}_3$	730	711	721
	1049	1051	1052
	1357	1350	1343

In sodium nitrate so far as the inactive frequency at  $9.5 \mu$  is concerned the fused state occupies an intermediate position between the crystal and the solution while in potassium nitrate this oscillation is apparently uninfluenced by the physical state. This independence of the inactive frequency upon the physical state becomes more and more apparent as the weight of the metallic radical increases. Thus the greatest discrepancy is shown only in lithium and in sodium. With regard to the active frequencies there does not seem to be any systematic variation. The very short shifts observed in crystals and associated with the lattice structure are not obtained in the fused salts.

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#### Boring Apparatus in Balantidium.

SINCE Ray<sup>1</sup> pointed out the presence of a boring mechanism in *Balantidium sushilii* from *Rana tigrina* Daud, I have examined several other species of *Balantidium* from the same host and *Bufo melanostictus* Schneid, available in Calcutta. From the accompanying camera lucida drawings of

<sup>1</sup> Ray, 1932. "On the Morphology of *Balantidium sushilii* n.sp., from *Rana tigrina* Daud." *Jour. Roy. Micros. Soc.*, **52**, 374-382.

*B. elongatum* Bezz., *B. helence* Bezz., and *B. rotundum* Bezz., it will be clearly seen that such a mechanism is also present in these species and that the borer (*b*) in each case is connected with an axial system of fibres (*ax*). Other fibres which are purely morphonomic in nature, as pointed out by

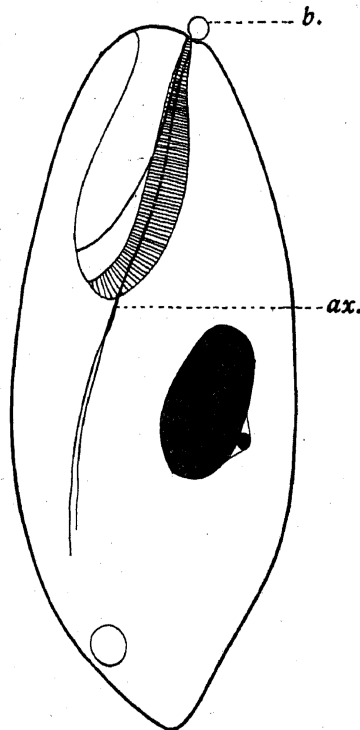


Fig. 1.  
*B. elongatum* Bezz. × 555

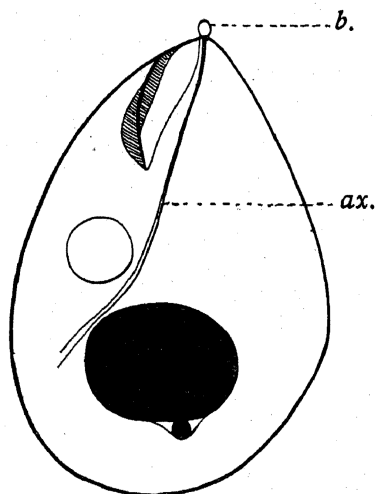


Fig. 2.  
*B. helence* Bezz. × 555

Ten Kate<sup>2</sup> are, no doubt, present in these

<sup>2</sup>Ten Kate, 1927. "Über das Fibrillensystem der Ciliaten." *Arch. f. Protistenk.*, 57, 362-426.

species of *Balantidium*, but as to the function of the axial system of fibres here, I am inclined to agree with Ray, in suggesting that they have got some sort of motor function as well.

In the cytoplasm of all these species of *Balantidium* I have also been able to

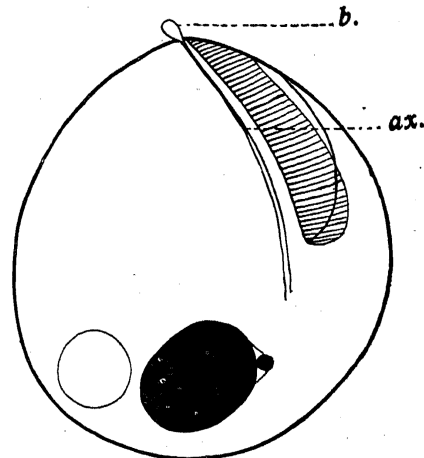


Fig. 3.  
*B. rotundum* Bezz. × 555

demonstrate the presence of red-blood corpuscles by various methods of differential staining.

Detailed observations on these will soon be published elsewhere.

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#### Influence of Nutrition on Sexual Expression in Maize.

SEEDLINGS of maize grown in moist sawdust were transferred to 6" pots containing garden soil in early January 1933. In some pots single plants were put, in others 6-8 plants in a ring and in some others 15 or more plants were crowded in together. Most of these started flowering in early April, though they had grown only to a height of 6-8". Single inflorescences were borne terminally. Single plants in pots developed primarily male inflorescences with one or two female flowers at the base of the inflorescence (Fig. A); overcrowded plants developed female inflorescences with rudiments of male flowers at the tip sometimes, which could only be seen under a dissecting microscope (Fig. C. I-IV); and the plants which had been grown in a ring, *i.e.*, which had not been so much overcrowded usually had inflorescences in which male