

weakly keeled snail which breeds true. The rate of change from aculeate to smooth, though small, is much higher than that of mutation-rates in general.

The keel in *P. jenkinsi* is produced by a small blunt lobe of the mantle edge which is most conspicuous in aculeate snails.

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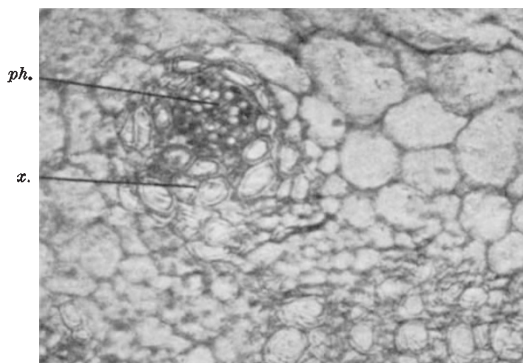
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Concentric Vascular Bundle in some Ascidian Stalks of *Clerodendron infortunatum* Gaertn.

SOME ascidian stalks of *Clerodendron infortunatum* described earlier¹ contain a few vascular bundles which are concentric—some amphivasal and others amphicribal in structure. The amphivasal vascular bundles are seen near the tip of the ascidian stalk. In tracing the origin of this amphivasal vascular bundle from the base to the tip in serial sections, it was observed that the basal collateral vascular bundle becomes gradually a horse-shoe shaped one which ultimately becomes amphivasal in shape (see photomicrograph). At an upper level this concentric vascular bundle reverts successively to the horse-shoe shaped and collateral types. During the transition stage of the vascular bundle from collateral to concentric structure, its upward course is diverted towards the pith. Here the amphivasal vascular bundle is seen embedded within three to six layers of cells of the pith. Next, the concentric bundle turns outward again and takes its place by the side of the neighbouring collateral vascular bundles, by which time it has assumed its collateral form.



Photomicrograph of an amphivasal vascular bundle. \times c. 150.
ph., phloem; x., xylem

The second type of concentric vascular bundle, namely, the amphicribal one, is found near the end of the ascidian stalk, where the bundles are mostly partially or rarely completely concentric. In the petiole of many plants such amphicribal vascular bundles have been noted by Eames and MacDaniels², Metcalfe and Chalk³ and Solereder⁴.

The leaf-trace bundles of many monocotyledonous rhizomes and the medullary strands of some dicotyledonous plants are amphivasal⁵. Arber⁶ recorded its occurrence, among others, in the foliage leaves of

some monocotyledonous plants. It does not appear to have been recorded before in the petiole of *Clerodendron*. Fuller details will be published elsewhere.

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Transmission of a *Nuttallia* of a Gerbil by *Rhipicephalus sanguineus*

FOR some years we have been searching for piroplasms among those local rodents which can be bred in the laboratory. Success in this direction would obviously facilitate work on piroplasmosis and would also provide convenient material for chemotherapeutic studies.

A *Nuttallia* found in a gerbil, *Meriones tristrami*, is the nearest approach we have made so far in this direction. This *Nuttallia* is non-pathogenic for normal animals but becomes pathogenic, though rarely fatal, in splenectomized animals. After splenectomy the parasites multiply until almost 90 per cent of the red cells are infected. The infection becomes chronic with exacerbations of high parasitaemia at various intervals. We have not seen spontaneous cure in animals observed for twelve months. Unfortunately, this piroplasm is not infective for other laboratory animals (very rarely a transient infection is produced in splenectomized mice). This, however, is no great drawback since *Meriones tristrami* can be bred in the laboratory.

This *Nuttallia* is readily transmitted by inoculation of whole blood. We have also transmitted it by nymphs of *Rhipicephalus sanguineus* reared in the laboratory and fed as larvæ on infected animals. It is interesting to note that *Rhipicephalus sanguineus*, which has been employed extensively in experimental transmission of piroplasms of domestic animals, of *Hepatozoon canis* and rickettsias of man and animals, really contains two distinct species readily distinguished by the characters of the larvæ and nymphs and the genital aperture of the female. This finding necessitates a revision of some of the accepted data on the transmission of a number of important pathogens.

We may add that *Meriones tristrami* is frequently parasitized by a *Grahamella*, which we have transmitted in the laboratory by *Haemaphysalis otophila*.

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