less affected by atmospheric changes and possibly survived the general cataclysms which overtook their northern congeners.

Plate I.
Horn showing bur of a deer.

Plate II.
Cervical Vertebra of a Ruminant.
possibility of Bos.

We hope to be able to revert to the subject soon with more evidence than we are able to put forward at present and reproduce here photographs of two fossils from our collection which is fairly rich. These are proposed to be dealt with in detail separately.

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Occurrence of the Tracheids in the Gametophyte of *Adiantum lunulatum* Burm.

LANG has described tracheids in the apogamous gametophytes of a few species of ferns.* So far as the knowledge of the writer goes, nobody else has described the presence of tracheids in the fern gametophyte. The writer has come across stray patches of tracheids in the body of the gametophyte of the fern *Adiantum lunulatum* Burm. Pure cultures of the gametophyte of the species were raised from the spores, which were sent by Ratna Bahadur Pradhan from Sikkim. The spores were sown on sterilized soil in pots which were covered over with glass plates to avoid contamination. The cultures were placed in a glass house with cultures of other species, all of which were watered from below.

The well-developed prothalli of *Adiantum lunulatum* show tracheids in the region just anterior to the cushion behind the apical notch. The cells at this place are very much elongated even if they are not thickened in the manner of the tracheids. The latter usually form clusters of 2—4 elements. In the prothalli which have either developed two anterior growing points or where the normal growing point has become shifted to one side, another patch of tracheids may develop in the tissue posterior to the growing region. Two or sometimes three groups of tracheids which remain usually isolated from one another have been observed in a single prothallus.

The antheridia of the species are of the

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* *Phil. Trans.*, 190, 1898.

usual leptosporangiate type and produce apparently functional motile sperms. The archegonia, however, are completely absent and have not been seen. The sporophyte arises apogamously as a bud from the gametophyte. The tracheidal mass formed in the interior of the apogamous bud may be connected with the tracheids of the prothallus but more often it remains quite isolated.

The gametophytes of *Pteris biaurita* Linn. and *Anisogonium esculentum* Presl. kept alongside the cultures of *A. lunulatum* showed no development of tracheids. The former resembles *A. lunulatum* in the complete absence of archegonia and the development of embryo by means of an apogamous bud. *Anisogonium esculentum*, however, has a normal prothallus.

It seems that the development of tracheids in the gametophyte of *Adiantum lunulatum* is not due to the effect of external conditions but depends probably on internal causes. Further cultural and cytological investigations are in progress.

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Lahore,
July 11, 1932.

A Short Note on the Structure and Development of *Petalophyllum indicum* Kash.

THE species was found for the first time by the writer in November 1925 and a brief systematic description was given by Prof. Kashyap in the *Journal of the Indian Botanical Society*.* The writer has worked out pretty fully the structure and development of the plant with the exception of earlier stages of the sporophyte. The midrib of the thallus is mycorhizous, the cells containing unseptate hyphæ. Enlargements of the hyphæ resembling oogonia have also been found in certain cells. Growth takes place by means of a three-sided pyramidal apical cell giving off two lateral and one ventral series of segments. The growing point is protected by 3-5-celled mucilage hairs and a few triangular scales.

The plants are diœcious. The scales which protect the antheridia become occasionally fused near the apex to form definite chambers in which the antheridia lie. The development conforms to the usual type of the Jungermaniales. A row of three cells is formed before the formation of a vertical wall. In one case a row of four cells was present without any vertical wall whatsoever.

The development of archegonium follows the usual Jungermaniales type. A few abnormal archegonia have been seen; in one case there were two eggs in the venter, in another the ventral canal cells were multinucleate. A careful investigation of the perianth proves it to be similar to the perianth of *Sewardiella tuberifera* described by Prof. Kashyap.* In the course of its development, there are free bracts in the early stages which are carried up by basal zonal growth to form the usual bell-shaped perianth. A few bracts are found attached to the inner and the outer surface of the perianth and a few are sometimes met with quite free inside the involucre near the base of the seta.

B. R. VASISHT.

Lahore,
July 11, 1932.

* *Jour. of the Ind. Bot. Soc.*, **6**, 14, 1918.

Chromosome Number in Pyrgomorphinæ (Acrididæ).

THE chromosome number in the males of the majority of Acrididæ (Acridinæ, Oedipodinæ and Tryxalinæ) has been established to be 23 including 11 euchromosomes and a single X-chromosome. A few occasional variations occur but are of a nature not to invalidate the numerical constancy in the group. But in the subfamily Pyrgomorphinæ, as alluded to by McClung casually in a foot-note to his paper on the Synopsis of Mecostethus,† the chromosome numbers exhibit definite departure from the above rule. The writer has been engaged for some time past on a comprehensive study of the chromosome behaviour in the male germ cells of Pyrgomorphinæ and preliminary to the preparation

* *New Phytologist*, **14**, 1915.
† *Jour. Morph.*, **43**, 2, 1927.