

beyond  $\frac{1}{4}$ " there is a rapid fall in the strength of the pier—The economical proportion of cement mortar that could be used with wire cut bricks—The different ways of failure of the pier under direct compression.

(3) *Lean Cement Mortar*.—Tensile and compressive strengths against period of setting from neat cement to mortars of 1 to 10 proportions—Investigations of lime mortars of the proportions commonly used in practice.

A graph showing comparative strengths of wire-cut brick, wire-cut brick piers with varying thicknesses of joints and 1 to 6 cement mortar is given (Fig. 1).

Detailed investigations and the results are being published elsewhere.

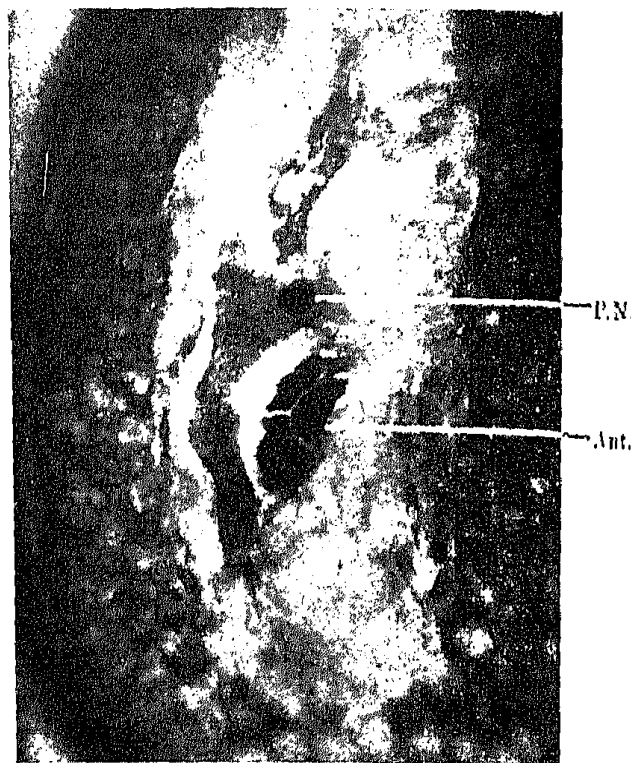
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### The Antipodals of *Pupalia lappacea* Juss.

In all members of the Amarantaceæ so far investigated, the antipodals have been reported to be three in number. The same condition has been observed by the writer in *Celosia argentea* Linn., *Cyathula tomentosa* Moq. and *Acrura lanata* Forsk.<sup>1</sup> In *Pupalia lappacea* Juss., however, the situation is different. Here the antipodals are three in the beginning, but soon they begin to multiply. All of them divide to form a small mass of cells as shown in the accompanying photograph. Their total number is variable, but up to 30 to 40 cells can be commonly counted in the later stages. The cells of this antipodal mass are generally small, full of cytoplasm and without vacuoles, but among them a few larger cells are also found and these show prominent vacuoles. The multiplication of the antipodal cells takes place before the division of the primary endosperm nucleus, which lies somewhere near the mass of the antipodals. During the secondary elongation of the embryo-sac the antipodals are pushed laterally, and persist after fertilisation upto the early stages of embryo development on one side



*Pupalia lappacea*. Photograph of the middle portion of the embryo-sac showing the primary endosperm nucleus and the laterally pushed antipodals. X 300. P.N., Primary endosperm nucleus. Ant., Antipodals.

of the embryo-sac, as in *Digera*,<sup>2</sup> *Althoffia*,<sup>3</sup> and *Achyranthes*.<sup>4</sup>

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<sup>1</sup> Kajale, L. B., Unpublished observation.

<sup>2</sup> Joshi, A. C., *Curr. Sci.*, 1930, 4, 741.

<sup>3</sup> Kajale, L. B., *Proc. Ind. Acad. Sci.*, (B), 1935, 1, 476-80.

<sup>4</sup> Kajale, L. B., *ibid.*, 1937, 4, 195-205.

### Martynia Pollen Germination on the Sesamum Stigma.

The genera *Martynia* and *Sesamum* belong to the family Pedaliaceæ. With a view to evolve disease and pest resistant Sesamum plants with high oil contents, etc., attempts are being made to cross *Sesamum indicum* L. (♀) with *Martynia diandra* Glox. (♂).

Pollination was done at different hours of the day and night and at definite intervals the pistils were removed and fixed in a mixture of 70 per cent. alcohol (10 c.c.) and formalin (1 c.c. of 40 per cent.). Longitudinal free-hand sections were cut and stained in lacto-phenol—cotton blue-safranin for about one minute.<sup>1</sup> Destaining was