The designation of such a phase in accordance with current nomenclature would be *sScS*. This phase does not appear to have been recorded on any previous occasions. It is similar in character to *ScS*, and both are remarkably prominent on some of the seismograms.

The time-interval (*sScS–ScS*) provides a comparatively accurate method for determining the focal depths of abnormally deep earthquakes from a single seismogram at short epicentral distances : the interval being practically independent of epicentral distance.

R. C. HAYES.

Dominion Observatory,
Wellington, N.Z.

The Oblong Sunfish (*Ranzania*) in the Indian Ocean

DR. E. W. GUDGER, of the American Museum of Natural History, recently referred in NATURE (April 6, 1935, p. 548) to the occurrence of *Ranzania* in the Indian Ocean, his only record being based on an original painting from Mauritius by Nicholas Pike.

The Australian Museum possesses two specimens of the oblong sunfish from the Indian Ocean : (1) a small example from Mauritius, of which I have published a sketch[1], and (2) a larger specimen from near Albany, Western Australia, whence the species had been recorded by McCulloch in 1910. Other records of this fish have been tabulated by me[2] in an account of its synonymy.

Apart from the few recorded specimens from Mauritius and Western Australia, there are few references to this fish in the Indian Ocean region. Thus Pennant in 1798 listed "*Balistes truncatus*" from Ceylon and this, like the sunfish in Day's Supplement to his "Fishes of India", may have been a *Ranzania*. Also in 1798, Lacépède described a *Ranzania* from a drawing by Commerson, who probably painted it in Mauritius. Dr. J. Pearson published a note and a photograph of a sunfish (Pearson, *Spolia Zeylanica*, **7**, 208 and fig. ; 1911) from near Jaffna, Ceylon, which is easily recognisable as a *Ranzania*.

Dr. Gudger has requested me to direct attention to these records, bibliographical references to which will be found in the papers quoted.

GILBERT P. WHITLEY.

Australian Museum,
Sydney. June 14.

[1] Whitley, G. P., "Sunfishes", *Victorian Naturalist*, **49**, 207–213, fig. 6 ; 1933.
[2] Whitley, G. P., "Studies in Ichthyology, No. 7," *Rec. Australian Mus.*, **19**, 108–111 ; 1933.

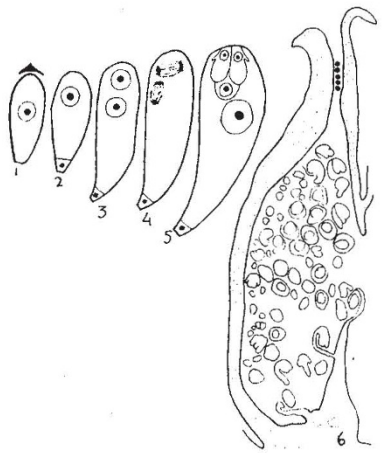
Life-History of *Butomopsis lanceolata*, Kunth.

MEMBERS of the family *Butomaceae* have received little attention, although several genera and species of the closely allied family *Alismaceae* have been thoroughly worked out. Recently I had an opportunity of investigating the life-history of *Butomopsis lanceolata*, material of which was kindly supplied to me by Mr. A. C. Joshi of Benares.

The development of the male gametophyte follows the normal course. There are two definite male cells and a tube nucleus in the mature pollen grain.

The development of the female gametophyte presents some interesting and unusual features. The hypodermal megaspore mother-cell divides to form a small ephemeral cell at the top and a larger cell below, which develops into the embryo-sac (Fig. 1). Of the two nuclei resulting from the first division, the primary chalazal nucleus is very small, and may sometimes be cut off by a wall (Fig. 2). It degenerates very early and may be said to represent the single antipodal cell the remains of which can be seen up to the time of fertilisation. The primary micropylar nucleus divides twice and produces four nuclei, three of which organise into a normal egg-apparatus and the fourth is the upper polar nucleus (Figs. 3–5) ; the lower polar is missing.

Double fertilisation occurs. The endosperm is of the Helobiales type, as also reported for *Echinodorus macrophyllus* by Dahlgren[1]. Sometimes supernumerary bodies resembling the sperm nuclei have also been seen in the pollen tube. These are similar to the X-bodies described by Artschwager[2] for the sugar beet.



FIGS. 1–5. Schematic representation of the development of the embryo-sac of *B. lanceolata*. FIG. 6, longitudinal section of the ovary, showing pollen grains in the stylar canal.

A very striking phenomenon was observed in connexion with pollination. Usually the pollen grains germinate on the stigma, but in some favourable preparations a few were found *inside the hollow stylar canal* (Fig. 6), *and even inside the ovary*. In one case a pollen grain had germinated and sent out a small pollen tube.

I am not aware if a parallel case has been reported for any other angiosperm, and would be grateful to other botanists for directing my attention to the relevant literature on this subject.

I am deeply indebted to Dr. P. Maheshwari for his kind help and valuable suggestions.

B. M. JOHRI.

Department of Botany,
Agra College, Agra.
July 18.

[1] Dahlgren, K. V. O., "Die Embryosackentwicklung von *Echinodorus macrophyllus* und *Sagittaria sagittifolia*", *Planta*, **21**, 602–612 ; 1934.
[2] Artschwager, E., and Starret, R. C., "The Time Factor in Fertilisation and Embryo Development in the Sugar Beet", *J. Agric. Res.*, **47**, 832–43 ; 1933.

Functions of the Corpus Allatum of Insects

IT was suggested recently[1] that the active substance (moulting hormone) which initiates cell division in the epidermis of *Rhodnius* and so induces moulting, and the substance (inhibitory hormone) which restrains 'metamorphosis' until this insect is full-grown, are both secreted by the corpus allatum. By transplanting the corpus allatum from a younger