RHYNIA: A BRIEF ACCOUNT

PAPER-I
Group-B

TDC Part-I (Hons.)
(2019-22)

Systematic Position:

Class - Psilophytopsida
Order - Psilophytales
Family - Rhyniaceae
Genus - Rhynia

Fossil History:

(i) Rhynia is the best known Middle Devonian genus of Psilophytopsida, a class of fossil Pteridophytes.
(ii) Kidston and Lang (1917) first of all reported the discovery of the fossils of Rhynia from the Rhynie chert in Aberdeenshire district of Scotland.
(iii) Two species of Rhynia have been reported: R. major and R. gwynnevaughani.

The Sporophyte:

(i) Plant body consists of a cylindrical, horizontally-growing, subterranean, rhizoid-bearing rhizome with dichotomously branched, leafless, aerial shoots.
(ii) Height of the sporophyte: 20-50cm. Diameter: 1.5-6 mm.
(iii) Tips of the aerial branches are gradually tapering and some of them bear oval sporangia.
(iv) Spores borne in tetrads in the large cavity of the sporangium, homosporous and heavily cutinized.
(v) Sporangial wall - Two-layered, inner one probably functioned as tapetum.
(vi) Internally the axis is differentiated into extrastelar and stelar regions.
- Extrastelar region consists of an epidermis with stomata and a thick cortex with prominent intercellular spaces.
- Stelar region is protostelic and

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xylem is completely surrounded by phloem.
—Xylem comprises annular tracheids only.

Reproduction:

Rhynia seems to have reproduced vegetatively and asexually. No gametophytes are known.

(a) Vegetative Reproduction

(i) Small outgrowths, occasionally developing into lateral branches, are supposed to have been formed on the aerial shoots.

(ii) These branches are known to possess independent vascular strands and constricted at their points of attachment. This suggests that these branches easily detached and probably formed a means of vegetative propagation.

(b) Asexual Reproduction

(i) Sporangia borne singly at the apices of some aerial branches of the sporophyte.

(ii) Sporangia gave rise to spores in tetrads in the central cavity. ~~No columella has been reported.~~

(iii) Spores measured upto 60μ in diameter. Rhynia was in all probability homosporous.

(iv) Sporangia are not found to show any signs of the presence of a columella.

(v) Tetrahedral tetrads of spores suggests that they were formed by reduction division, and the plant bearing them represented the sporophytic generation.

(vi) No special mechanism of sporangial dehiscence probably occurred. Liberation of spores seems to have been brought about by disintegration of the sporangial wall.

(vii) Nothing is known definitely about the gametophyte of Rhynia.

(Figs. to follow)

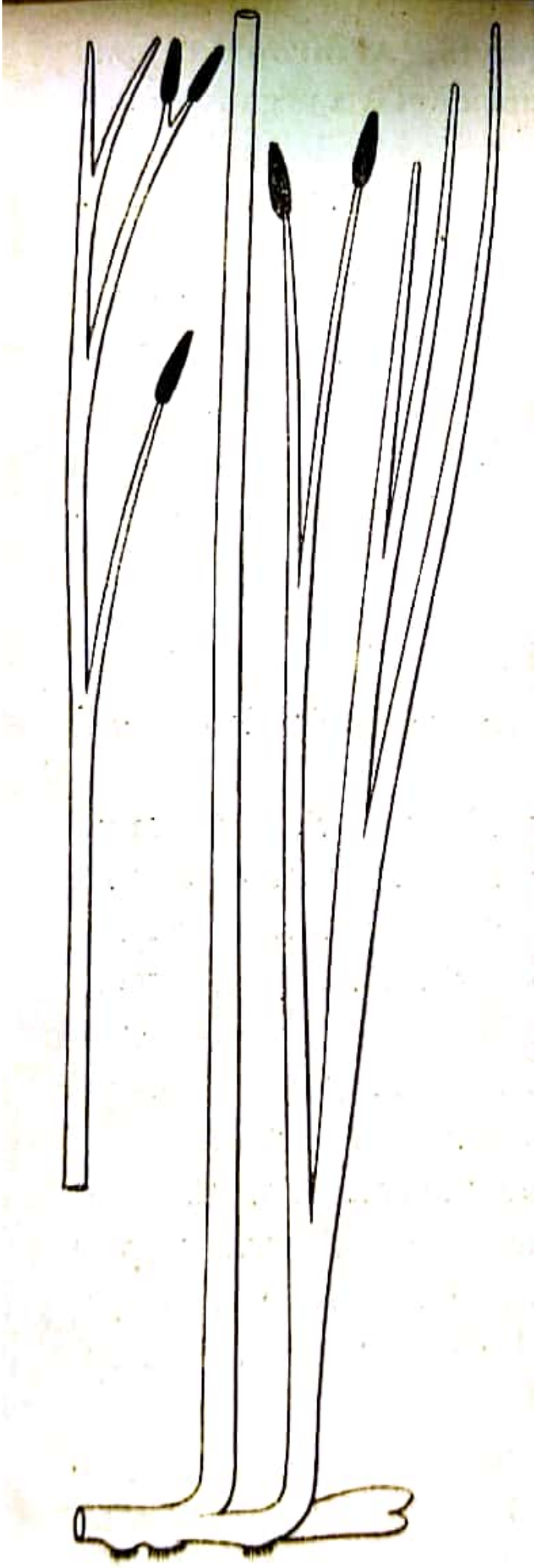

Fig. 298. *Rhynia*.
The plant body.

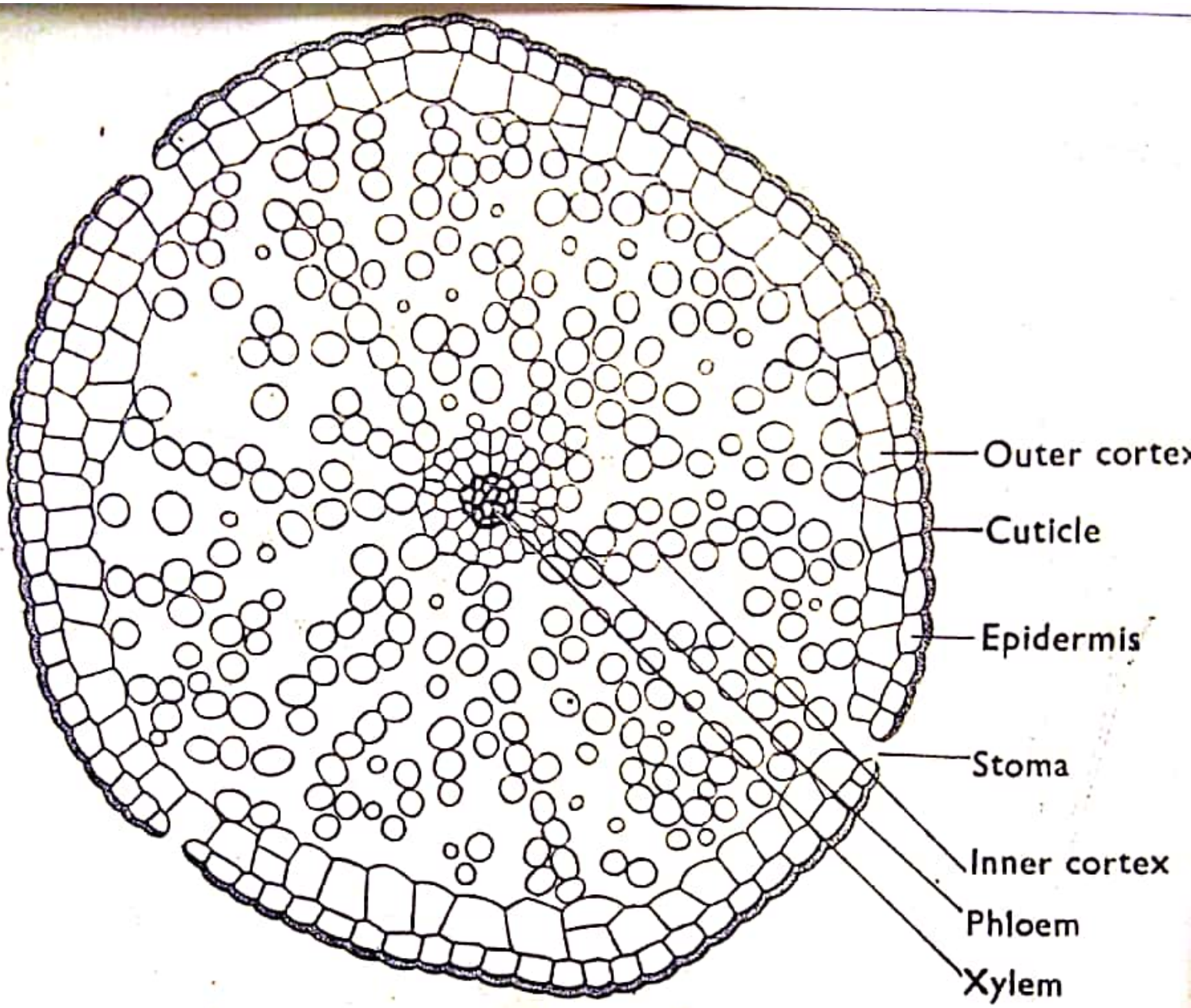

Fig. 300. *Rhynia*. T.S. of stem.

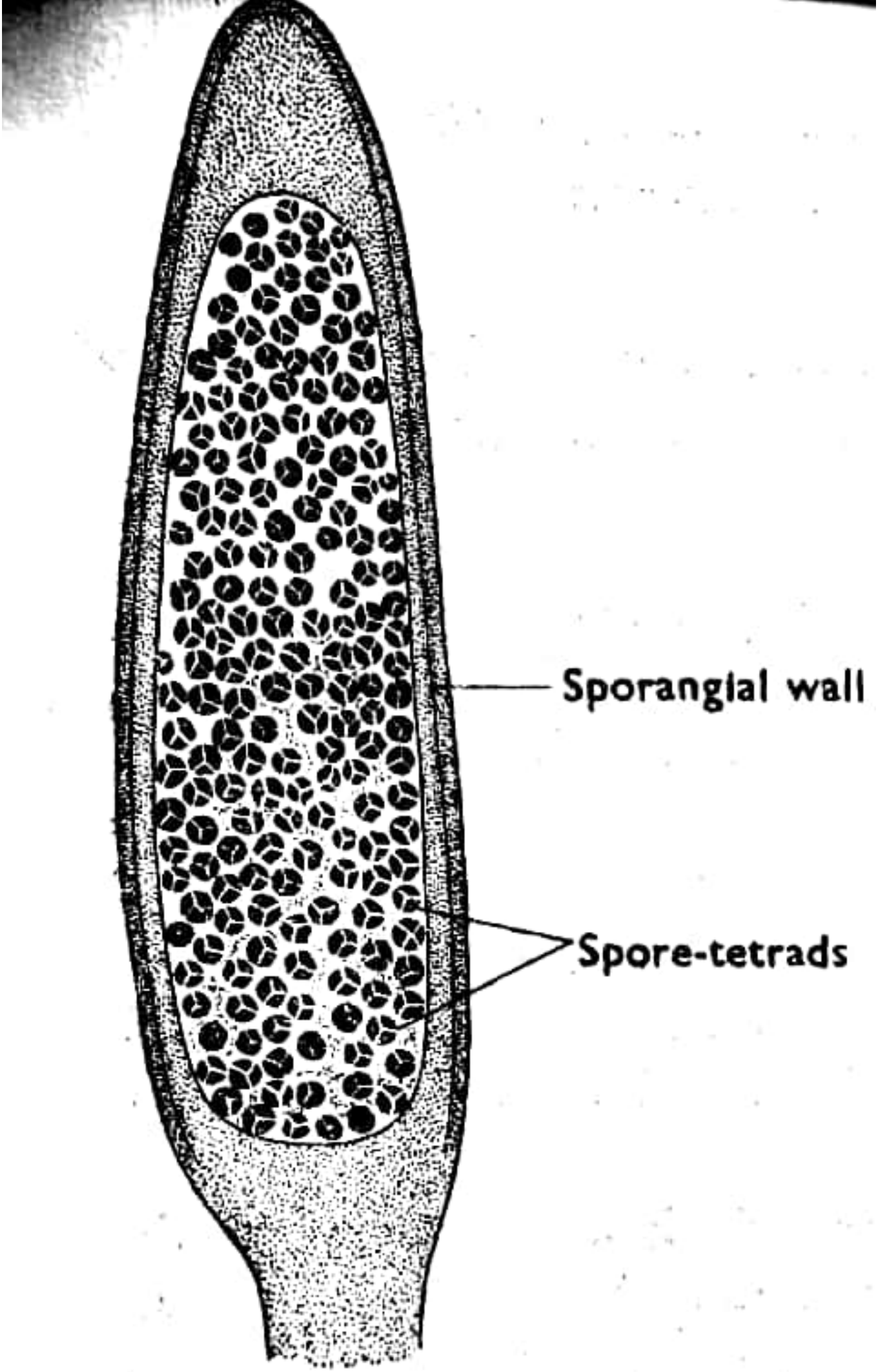

Fig. 299. *Rhynia*. L. S. of capsule.