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Joseph C. Gilman
Iowa State College

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ILLUSTRATIONS OF THE FLESHY FUNGI OF IOWA VII. Some common puff balls

JOSEPH C. GILMAN

Members of two families of the Gasteromycetes have been chosen for the seventh contribution of this series of illustrations, namely the Lycoperdaceae and the Secotiaceae.

The Lycoperdaceae, popularly known as the puff balls, are widespread saprobes in our fields and woods. The fruiting body (basidiocarp) consists of a dry, powdery mass of spores and sterile threads (capillitium), contained in a cover usually made up of a double wall, the outer and inner peridium. The outer peridium often is evanescent, leaving the inner as the more permanent covering of the spore mass. The basidiocarp may or may not possess a sterile base. In *Calvatia* the basidiocarp breaks into irregular fragments and falls away.

Calvatia gigantea, is one of the largest of the fleshy fungi, reaching a diameter of more than two feet. In an immature condition, when they are creamy white throughout, they are edible and considered a great treat by many people. *Calvatia cyathiformis* was chosen because of the striking purple color of its spore-mass. *Calvatia craniiformis* is much the same size and shape and has a similar habitat. It is easily separated from the field from *C. cyathiformis* by the fact that its spore-mass is yellowish green. These differences could not be shown in half-tones so that it is not illustrated at this time.

In Lycoperdon the inner peridium persists and the spores escape through a definite pore. *Disciseda* differs from these by being subterranean and by having the pore on the underside.

The Secotiaceae are often considered to indicate a connection between the Gasteromycetes and the Hymenomycetes. The stalk extends through the basidiocarp to its apex as a columella; the spores are borne on tramal plates attached to the peridium. These plates resemble the gills of a mushroom. Dehiscence occurs at the base where the peridium is attached to the stipe and under favorable conditions the peridium may expand to resemble the pileus of the mushroom. A single species is illustrated *Secotium agaricoides*.

The nomenclature of the species of Gasteromycetes has been very confused and much still remains to be investigated until stability is attained. The names and descriptions used in this paper are those given by Kambly and Lee, The Gasteromycetes of Iowa. These authors have summarized the Iowa species in an excellent manner and their work should be consulted by those persons interested in the Iowa puff balls.

1. Kambly, P. E. and Lee, R. E., 1936. The Gasteromycetes of Iowa, Univ. Iowa Studies. Studies in Nat. Hist. 17:121-185.

Calvatia gigantea (Pers.) Lloyd

Basidiocarp sessile, globose or subglobose, usually 15-45 cm. in diameter, sometimes larger, with a thickened attachment; outer peridium very thin and fragile, after maturity breaking up into fragments and falling away; gleba greenish yellow to olivaceous brown at maturity, subgleba very shallow or almost obsolete; threads of capillitium long branched, the primary branches thicker than the spores; spores globose, even or minutely warted, often with a short pedicel, 3.2-4.5 microns in diameter.

In autumn, on ground in open woods. Edible when young, that is, while still white throughout.

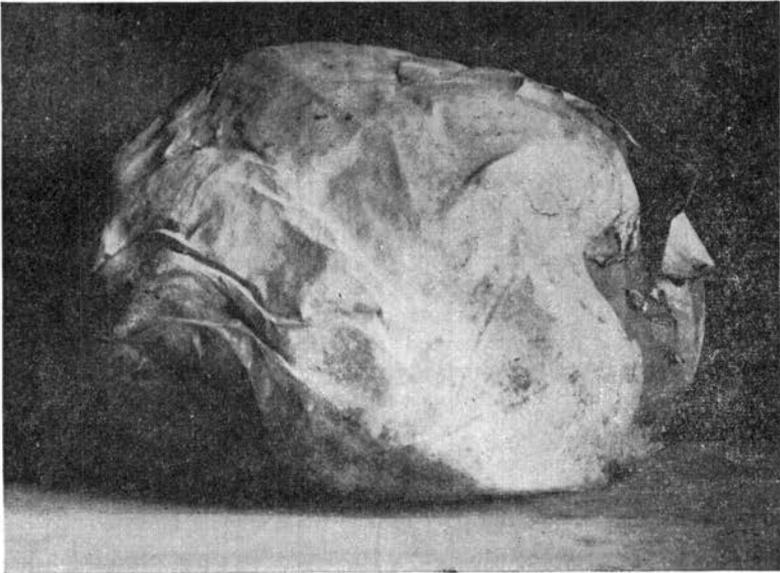


Figure 1. *Calvatia gigantea*.

Calvatia cyathiformis (Bosc) Morgan.

Basidiocarp 7-15 cm. in diameter, depressed-globose to turbinate, the base usually thick and stout; outer peridium smooth, slightly scaly, very thin and fragile, at maturity breaking up into fragments and falling away, exposing the pale to dark purple gleba; subgleba persistent; threads of capillitium long, thinner than the spores, scarcely branched, the walls with minute pits; spores globose, with numerous distinct warts, 5-7 microns in diameter.

In autumn on ground in meadows and pastures.

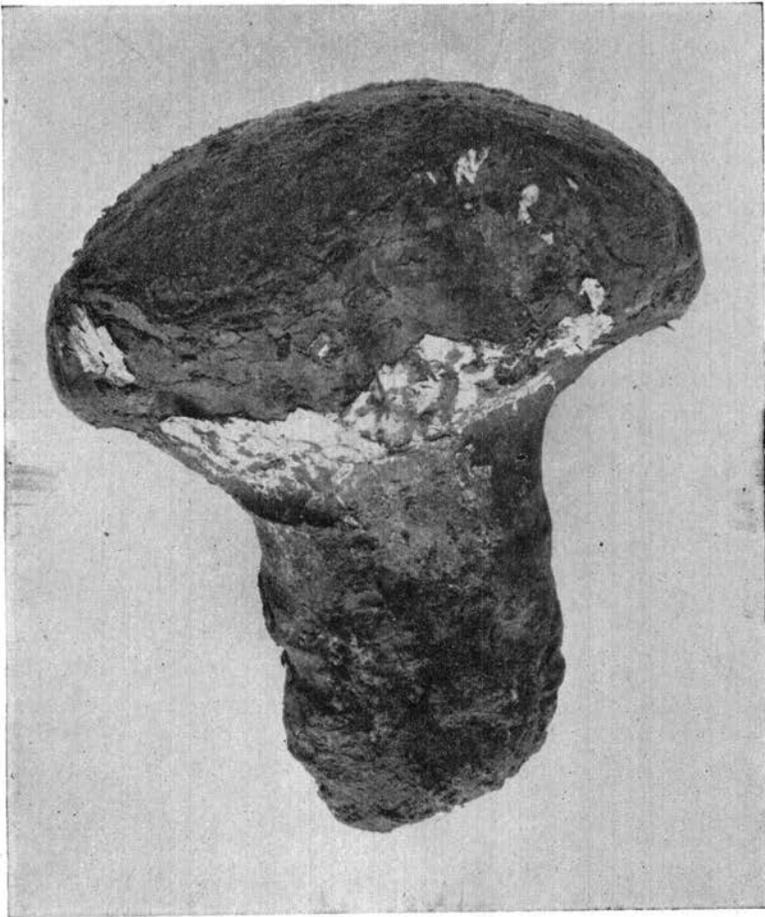


Figure 2. *Calvatia cyathiformis*.

Lycoperdon pyriforme Pers.

Basidiocarp obovoid or pyriform, 1.5-3 cm. in diameter and 2-5 cm. high, with abundant fibrous mycelium; outer peridium a thin,

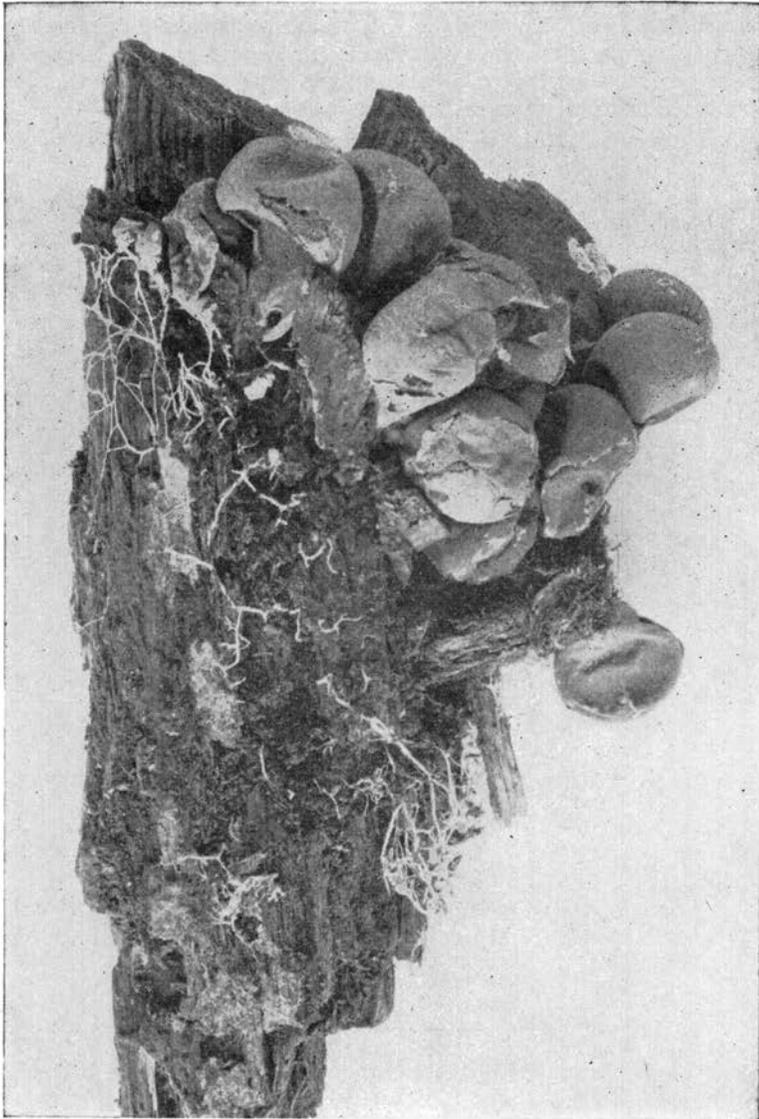


Figure 3. *Lycoperdon pyriforme*.

persistent coat of minute furfuraceous scales, or of granules or short spinules; whitish gray or brownish, later dark brown or reddish

brown, often areolate, in finely areolate forms sometimes squamulose; subgleba occupying only the stem-like base, white, of compact small cells; gleba greenish yellow, later brownish olivaceous; capillitium threads branched, the main axis thicker than the spores; spores globose, smooth, 3.5-4.5 microns in diameter.

In autumn on old logs or stumps.

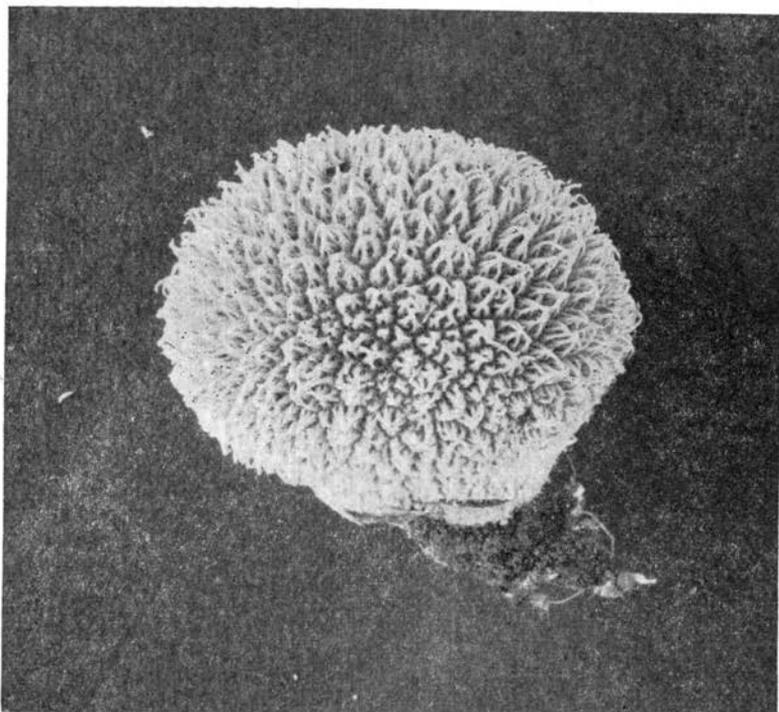


Figure 4. *Lycoperdon pulcherrimum*.

Lycoperdon pulcherrimum Berk. and Curt.

Basidiocarp obovoid, somewhat depressed above, 2-3 cm. in diameter, plicate beneath, arising from a thick cord-like rhizomorph; outer peridium of slender white dehiscent spines, the upper ones 2-3 cm. in length and the lower ones smaller, curved and convergent at the apex, often coherent, the upper ones falling first, leaving a cinnamon-brown mealy, or minutely granular coat, this also later dehiscent, exposing the smooth reddish brown or purplish brown inner peridium; subgleba broad and shallow, neither compact nor definitely limited above; gleba cinnamon-buff to cinnamon-brown, later becoming brownish purple; capillitium threads much branched, the main branches about as thick as the spores; spores globose, distinctly warted, averaging 5 microns in diameter.

In autumn, in woods.

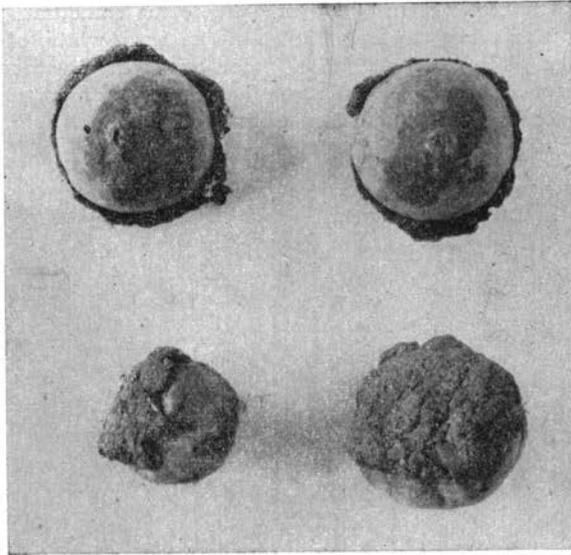


Figure 5. *Disciseda bovista*.

Disciseda bovista (Klotzsch) Kambly

Basidiocarp growing in the soil and partly exposed when mature, subglobose, often irregular, 1.5-2.5 cm. in diameter; outer peridium covered with adherent soil, fragile, after maturity torn asunder, leaving the greater portion in the ground; inner peridium subglobose, somewhat irregular, rather thick, smooth, dehiscing by an irregular basal mouth; threads of capillitium short, unequal in length, hyaline, 3-4 microns in thickness; spores globose, distinctly warted, 6-9 microns in diameter, pedicel lacking.

In grassy places, late summer or fall.

Secotium agaricoides (Czern.) Hollos.

Basidiocarp epigeic, solitary or gregarious, very often heart-shaped, with a distinctly thickened short stalk which anchors the basidiocarp in the ground, variable in size and shape, usually 1-6 cm. in diameter; peridium of a single layer, white when young, light brown when mature and dry, often covered with scales at maturity; columella distinct; spore-mass brown; spores smooth, ovate, yellowish brown under the microscope, 6.5-8 x 5.5-6.8 microns, with a short pedicel.

In autumn, in pastures and cultivated fields and on compost heaps.

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AMES, IOWA

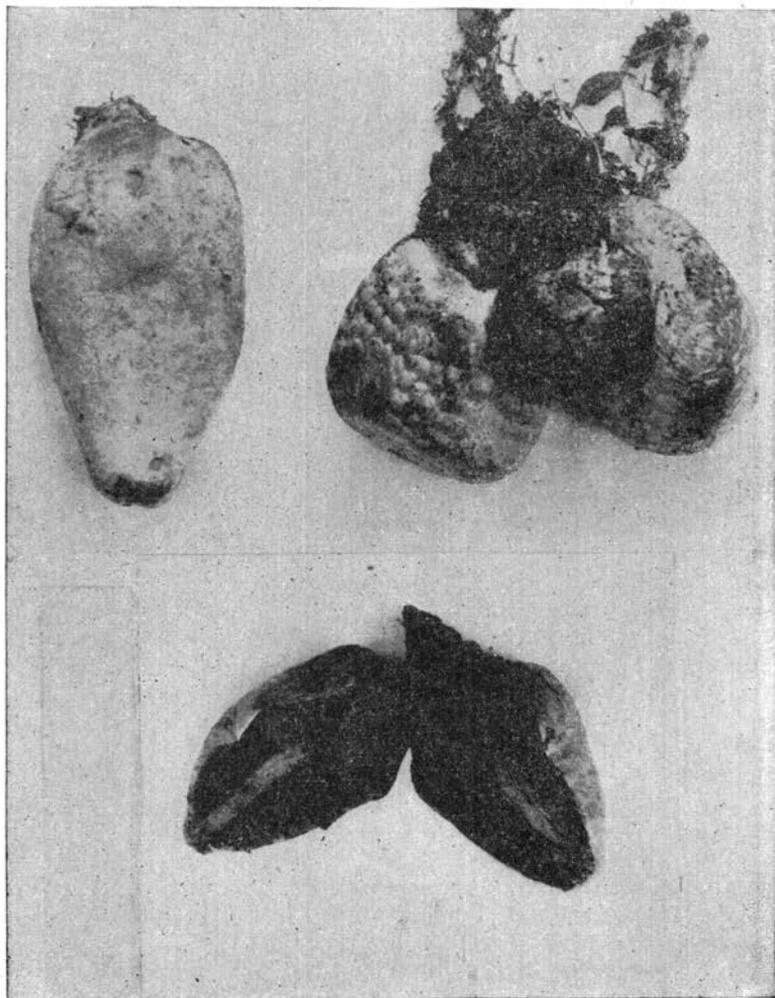


Figure 6. *Secotium agaricoides*.