

University of Oregon Leaflet Series

Published by the Extension Division

Botanical Bulletin

October, 1916

Vol. 2. No. 3. Part Two

Toadstool Talks

(Number One)

BY ALBERT R. SWEETSER

Professor of Botany in the
University of Oregon
Eugene, Oregon

It is desired that these leaflets reach those to whom they are of the most
value. Accordingly, if you wish them continued kindly send your request
on a postal to the Extension Division, University of Oregon

Published monthly by the University of Oregon, and admitted as second class
matter at the postoffice at Eugene, Oregon

Toadstool Talks

7OADSTOOLS," says one — "we don't care to hear about those deadly things: we want to know what we may safely eat; we would learn to recognize the mushrooms."

Now this distinction in the use of the two words is implied rather than real. They are all toadstools, they are all mushrooms; and some are edible and some are not; but there is no royal rule by which they may be distinguished, including the blackening of a silver spoon, ease of peeling, odor, etc., etc. Experiment has demonstrated that several hundred varieties may be eaten, but we do not care to play the part of experimenters, and the only safe plan is to know a few of the clearly differentiated and well-flavored forms and *stick* to them.

Figure 1 is from a photograph of an edible species quite common in our fields and old ploughed grounds in the fall when the ground becomes softened. The stem is usually enlarged below into a sort of bulb, but NOT a cup or pocket. It tapers upward and has a ring around it. The top or cap is white, and sometimes with brown patches or tinged with brown; and on the under side are radiating plates or gills. These gills bear innumerable minute white spores, which have the same office as the seeds of the higher plants, but differ in every other respect. This particular mushroom was chosen to serve as an introduction to the study. When growing in the field it might be mistaken for the pink-gilled meadow mushroom, but its



Figure 1. Smooth *Lepiota* (*Lepiota riuacinsides*); edible.

In the upper row are five individuals in various stages from the button to the mature. The left hand lower is a view of the under side with the stem removed and showing gills. The other two are sections of the button and the mature.

white spores are a distinguishing mark. It has a fine flavor and very rare harbors worms, which is not true of the meadow mushroom. To recap late: Cap smooth as a kid; gills and spores white; absence of any signs

cup. This cup, or volva as it is called, when present is sometimes more or less below ground. The whole fungus should be picked.

The cut shows the progressive development from the button to the mature condition. It will be noted that at first the cap is down like a closed umbrella, and its edges are joined to the stem by a thin membrane or veil. As development progresses, the cap is uplifted, breaking away from the stem and leaving the veil attached as a ring. In the lower row to

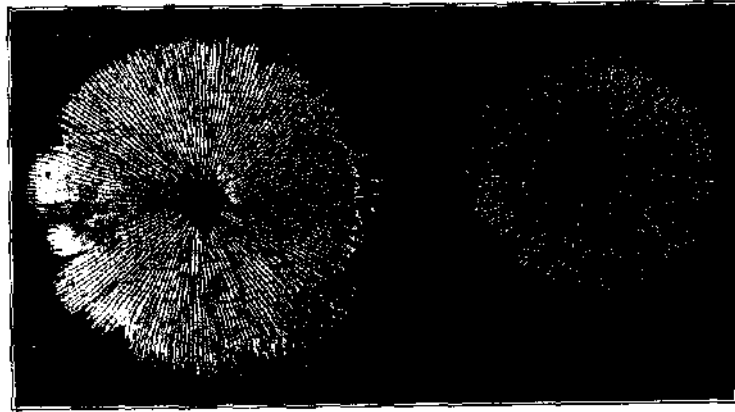


Figure 2. Spore Prints

the left is a mature specimen with the stem removed and seen from below, showing the gills; then a section lengthwise of a button with, the gills still attached to the stem by the veil; and last a similar section of a mature plant.

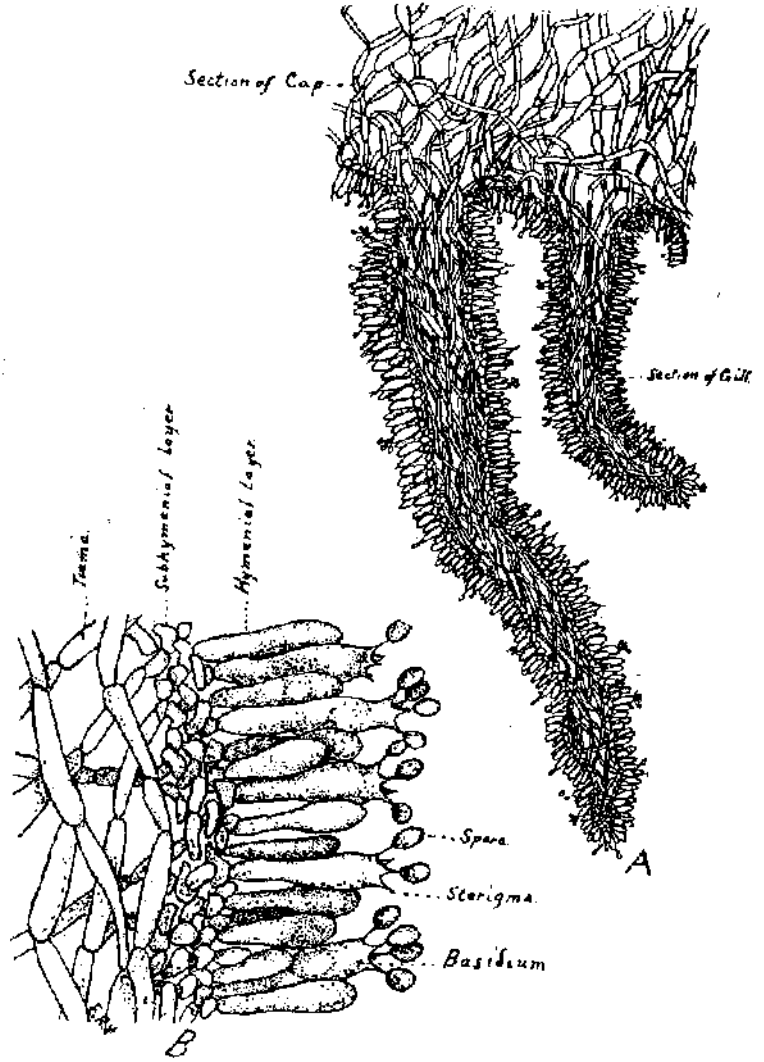
One of the first divisions in the classification of the toadstools is based on the color of the spores. It will not do to rely upon the color of the gills of the young plant, as the gills often change with age. The method commonly used is to make a spore print, such as seen in Figure 2. This may be done by cutting off the stem close up to the cap and placing the cap, gill side down, on paper and covering with a bowl or cup to prevent drafts, and the next day the gills will be outlined by the spores, which lie as they fell and in their true color.

Detailed Description

In Figure 3 (A) a thin slice has been cut through the cap and the two gills. A view under a low power of, the microscope is given. It will be noticed that the whole plant is a mass of compacted threads, and if we had, a similar section of the stem we should find that it was also composed of threads. If we investigate further we shall find, in the soil or decayed wood, or whatever the toadstool may be growing upon, what appear to be masses of colorless roots. But they are such in appearance only, for a microscopic examination would reveal the fact that they are also composed of numerous threads continuous with those of the stem. This underground portion is what is known as the mycelium, which when carefully searched will sometimes reveal enlargements of various sizes, these being toadstools in various stages of development. This underground growth continues *until* the plants have attained considerable size, when they push into the air; and his accounts for their sudden appearance as *if* they had *sprung* at *once full*

grown like a jack-in-the-box. This mycelium combined with horse manure is pressed into cakes, and is the "spawn" commerce.

Figure 3 (B) shows a small portion of one of the gills more highly magnified. It will be seen that the threads in the middle of the gill end in swollen tips, or basidia, on the face of the gill, and are packed so closely together as to give the appearance of a smooth surface. On these basidia are four slender threads, each of which carries a spore.



A. Cross; Section of a gill. Gap and

27. A 104 Atre, n of t/l +...mie 1174 /0e0,41..

Figure 3