# Toadstools in the Northwest

Albert R. Sweetser, M. A., is professor of botany at the University of Oregon, at Eugene, and wrote the following article when requested for an authoritative statement regarding the fungi that spring up in so many Northwest pasture fields, and along so many Northwest roadsides. The mushroom would make a valuable addition to the farm tables of the Northwest states if there were some sure way of identifying the various fungi species as poisonous or non-poisonous.—Editor.

**By Professor Albert R. Sweetser, U. of O.**

TOADSTOOLS or mushrooms—that's the question, and who can tell? As far as the words themselves are concerned, they are all toadstools—they are all mushrooms.

But the real desire is to know what we may eat and what we may not eat, and there is no royal road to this knowledge. Color, odor, or the ease or difficulty of peeling give no certain indication, nor is the action on a silver spoon of any value. The only safe way is to learn with certainty a few of the well-marked forms and stick to them. Fortunately there are forms the characteristics of which are so plain that they may always be recognized without any uncertainty.

The toadstools belong to the lowly group of plants called fungi. Lacking the leaf-green that is present in most of the higher plants, they must obtain their food already prepared for them, and so live on other plants or dead organic matter.

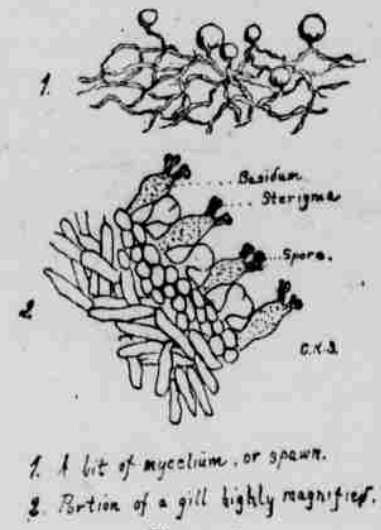


Figure A.

If we take a specimen and give it a little careful attention we shall see a stalk rising from the ground with a cap on the under side on which are either plate-like gills or slender tubes or teeth. Could we examine a portion of a gill or tooth or edge of tube under the microscope, it would appear as in Figure A 2, being composed of an innumerable number of threads, the swollen tips of which have each four prongs, each prong bearing a single spore or reproductive body. If we trace these threads backward we shall find them continuing into the cap and down the stalk and forming a felted mass under the ground known as the mycelium. (Figure A 1.) On this may often be seen little bunches, which are the coming toadstools. The spawn that is purchased for the cultivation of toadstools consists of this mycelium mixed with manure and pressed into a brick.

Figure B.

### Four Well Marked and Edible Forms.

It will be unnecessary to describe the meadow mushroom with its pink gills—it is well known to all and is gathered with confidence. This is often spoken of as THE mushroom, with emphasis on "the," as if it were the only edible variety, but mushroom devotees now have a list of several hundred that have been proved and found valuable as an article of food. The "meadow mushroom" is perfectly safe, and if one hesitates to experiment with other kinds, will usually furnish a considerable supply. As the meadow mushroom gets older the gills become dark brown.

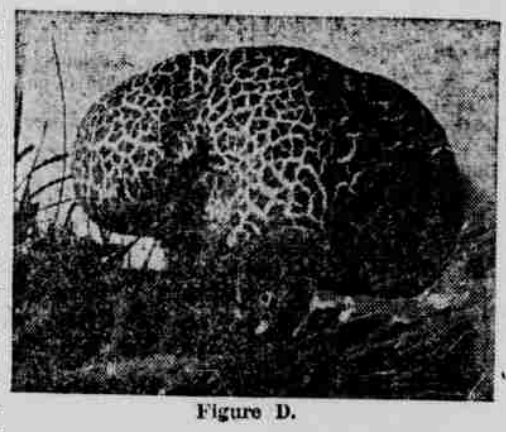

Figure D.

### The Shaggy Mushroom.

This interesting fungus has marked characteristics and is one of the best, and in the writer's opinion the very best, of the edible forms. When young it appears like a large egg with a brown upper end, and its sides are covered with silky scales tipped with brown. It always remains like a closed umbrella, never opening up flat. As it gets older it begins to drip an inky fluid from the edges of the cap, which eventually disappears entirely in this manner, leaving the stalk alone, which also in its turn decomposes. (Figure B.) It is most commonly found on the river banks or in lawns filled with this loam.

The shaggy mushroom should be gathered before it has begun to turn. The whole plant may be used. It should be washed and the scales should be scraped off with a blunt knife, then cooked in any of the ways known to the cooks. Here is one. Take a generous piece of butter, roll in flour and melt in stewpan, cut up the mushroom and add to the melted butter, cover, place over slow heat and allow to simmer for short time. Prepare thin toast and serve the mushrooms on this while very hot.

### Coral Fungus.

These also belong to the same family as the toadstools and mushrooms, but differ from the preceding in that there are no special parts differentiated to bear the spores. (Figure C.) They occur usually in clumps and often attain considerable size. They show quite a range of colors—white, gray, yellow, pink and red, and often are beautiful objects. The white forms are all safe and good if gathered when young. A good way to prepare them is to boil in salted water like asparagus.

### Puff Balls.

These are the familiar vegetable balls which give forth a cloud of dusty spores when trodden under foot. They vary from the tiny white ones as small as a bantam's egg to those the size of a man's head. They grow entirely on the top of the ground, or on top of whatever they are upon, and are easily distinguished. (Figure D.) If gathered while perfectly white and firm within they are safe and delicious. They may be sliced and dipped in egg and fried, or chopped and made into an omelet, or cooked in a variety of ways.

To conclude as we began, learn to know a few well marked forms and stick to them, unless you have an expert to introduce you to new forms. In this way you can add to your bill of fare a valuable food usually free for the picking.

The raising of mushrooms is comparatively easy if care is taken to purchase spawn of reliable dealers and if directions are followed with exactness. A cellar or shed or any place from the light can be excluded and temperature regulated will furnish a suitable location for a bed. Full directions may be found in two government publications which may be purchased from the Superintendent of Documents, Washington, D. C.

Farmer's Bulletin No. 204, price 5 cents.

Bureau of Plant Industry Bulletin No. 85, price 10 cents.

Figure C.

### Make Flats in Winter.

MAKE a lot of flats this winter for use in the garden. A flat is a shallow box of convenient size used for starting seedlings, for rooting cuttings or for carrying potted plants, pots, soil or other material. Many uses will be found for the flat, and it is advisable to have a good supply on hand. Soap or other boxes obtained from a grocer cut down to two and a half or three inches in depth make good flats.

A quantity of flats will be found very useful when gardening operations begin next spring.

## CYNAMID, FERTILIZER.

By Elton Fulmer, Professor of Chemistry, State College of Washington.

IN 1894 the technical world was astounded by the invention of Moissan which led to the manufacture of calcium carbide in the electric furnace on a large scale. The product thus obtained was at first used in the manufacture of acetylene for illuminating purposes, but the idea was soon conceived that the carbide ought to be useful for other purposes.

In 1895 Professor Frank Pointed out the possibility of producing cyanides, starting with calcium cyanamid as the raw material. This was based upon his discovery that the carbides when heated would absorb atmospheric nitrogen. In the middle of the nineties there was such a strong demand for cyanids owing to its use in the McArthur-Forest process of gold extraction, that much effort was centered on the production of cyanides from the carbides.

Barium carbide was first used, and the absorption of nitrogen by it, forming Barium cyanid, was found to be a very simple and easy matter, and that Barium cyanid could be readily transformed into the Potassium cyanid used in the McArthur-Forrest process.

### New Possibilities.

But inasmuch as calcium carbide was cheaper than Barium carbide, it was deemed desirable to substitute it in the process. Strange to say, when this was done, very little cyanid was produced, although nitrogen was freely absorbed.

Investigation showed that the chief substance formed was what may be called an intermediate produce between the calcium carbide and calcium cyanid, viz.: cyanid. This immediately opened up a new possibility, because it was soon discovered that by the action of hot water under high pressure, this new substance was readily converted into limestone and ammonia.

Hence, although calcium cyanamid can be easily converted into the desired cyanid, Professor Frank recognized the greater desirability of producing from it substances that would be capable of furnishing nitrogenous manures at a low cost.

Professor Frank's son went one step further, and suggested that perhaps the calcium cynamid might be slowly changed into compounds available for plant use under the combined influence of the moisture and carbonic acid of the soil and the heat of the sun's rays, and that therefore it might be used directly as an artificial fertilizer.

### Valuable Fertilizer.

The correctness of this theory was first tested in 1901 and 1902. Many tests were made in pot and field which showed that crude calcium cyanamid containing 20 per cent of nitrogen could be considered the equivalent of ammonia sulphate, and therefore might serve as a suitable nitrogenous fertilizer.

These results have since been confirmed experimentally in different countries, and there now seems to be no doubt but that it is a valuable fertilizer, having 94 per cent of its nitrogen available for plant use—acting a little more slowly than ammonium sulphate, and not subject to the losses that occur with nitrate of sade.

Thirty-seven experiment stations in the United States and Europe are said to have made comparation tests of it with nitrate of soda and ammonium sulphate, upon thirteen different crops, and the relative values per unit of ammonia are, as reported:

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| Nitrate of soda | 100 |
| Ammonium sulphate | 97 |
| Calcium cynamid | 105 |

Further experimentation is being carried on in many places, although it is very probable that the results obtained will only confirm the results already obtained. Many plants are being erected in various parts of the world for the manufacture of this new nitrogenous fertilizer.

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The number of students attending the Oregon Agricultural College is six per cent greater than at the corresponding date last year, and has almost reached the 1700 mark. The ratio of men to women is two to one.