THESIS

on

Mushrooms: Their Cultivation, Preservation and Culinary Preparation, including Descriptions of the Common Edible Varieties.

Submitted to the Faculty
of the
OREGON AGRICULTURAL COLLEGE
for the degree of
Bachelor of Science
in
Domestic Science
by
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APPROVED

Redacted for Privacy
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SOME EDIBLE MUSHROOMS.

M. E. Hard defines a mushroom as "a cellular, flowerless plant, nourished by the mycelium which permeates the soil or other substances on which the mushroom grows".

In all probability mushrooms are the most interesting of all the higher organized fungi. Within the past few years, interest in them has been growing, not only for those found in the fields and forests, but people through interest and profit desire to cultivate them for themselves.

When rainfall has been abundant mushrooms are to be found in grooves, fields, woods, and waste places. They are found near streams and ravines where it is damp and cool, in the summer. In forests they are also usually abundant.

The thought that a mushroom springs up in the is almost dispelled when we find that the spawn has lain in a tree trunk or the ground perhaps for centuries.

When speaking of mushrooms almost the first question asked is, "How do you tell a mushroom from a toadstool", or "What is the difference"? Many people have the idea that all mushrooms are edible and all toadstools poisonous. There is no difference; mushrooms and toad stools are one and the same and may be called by either name. By investigation it has been found
that these plants are highly destructive to forests. Trees that have been broken by snow, wind etc., are entered by the spores. The heart of the tree is then entered, the enzyme of the protoplasm making this possible, and decay rapidly follows.

Mushrooms are highly valuable as food, not for their nutritive value but as a relish. They are very appetizing although they are not of such high food quality as potatoes. They might be classed along with berries, fruits or even oysters. The value of mushrooms is often over estimated by some people, while on the other hand many look on them with horror as a food, thinking all of them poisonous.

In order to recognize an edible mushroom one must be somewhat familiar with the terms applied to the different parts of the plant. The first part of a mushroom which attracts the attention is the pileus or cap. This is usually disk shaped and the surface is of various colors. On the under surface of the cap are the gills or lamellae. The stem or stipe is cylindrical in shape. If present the ring or annulus is at the upper end of the stem.

The mushroom grows from spawn which consists of coarse white threads or cords known as mycelium. This grows in the soil, obtaining nourishment from decaying vegetable matter. At different parts of the mycelium small round bodies appear. As they grow larger the
stem appears, and new cells are formed which expand rapidly, thus causing the mushroom to develop in a single night.

Several people have been poisoned by mushrooms but in most cases it has been due to carelessness. Some of the supposed tests are as follows, but no one of them can be relied upon; "Eat no mushroom which discolors a silver spoon; eat no mushroom which is white through and through and exudes a milk when cut". But if these rules were followed we would lose several delicious edible mushrooms. Other authors say the only safe rule to follow is to reject all mushrooms with a cup at the base of the stem. Chas. McIlvaine says in his "One Thousand American Fungi, Poisonous and Edibles" ; "Any toadstool with white or lemon yellow gills casting white spores when laid gills down on a piece of paper, having remnants of a fugitive skin in the shape of scabs and warts upon the upper surface of its cap, with a veil or ring or remnants or stains of one, having at the base of its stem in the ground a loose skin like sheath surrounding it or remnants of one, should never be eaten until the collector is thoroughly conversant with the technicalities of every such species or has been taught by one whose authority is well known that it is a harmless species."

But one mushroom may be eaten by one person without serious effects while another might eat of it with
unpleasant results. Another way to test mushrooms is to cut off a small piece of the cap, chew it up but do not swallow it. If it has a bitter taste it is of no value as a food though many plants when cooked lose this bitter flavor. But if the plant has a pleasant odor and taste and is without other objections, it is almost always safe.

One author suggests that you cook the mushrooms and try them on the cat; if there are no serious results you may then eat them yourselves. A safe way to detect mushrooms is to learn to know them as you would know your friends. When collecting them always notice whether there is a ring on the stem; if there is, dig the plant up carefully and see if there is a cup at the base; if so do not use it. Not all plants having the cup are poisonous but if there is a doubt never take the risk. There are very few species which are poisonous besides the Amanitas. Always exercise caution as to whether the plant contains larvae or is past its prime. If you are certain of the kind of mushroom collected, it is not necessary to gather the stem and all, but simply the cap and in this way the plants will be kept cleaner. They should be prepared for the table directly after gathering.

No plant of whose identity you are uncertain should be eaten in the button stage; as important characteristic have not yet developed.
The three poisons taken from mushrooms are muscarine, phallin, and helvellic acid. Muscarine is the most dangerous. The effects are not felt immediately but several hours afterward. The symptoms are diarrhea, vomiting, giddiness and flow of the saliva. This is followed by stupor, cold sweats, and weak heart action. If this continues for two days, death follows.

The treatment consists in carrying off all the unabsorbed mushrooms in the alimentary canal and strengthening of the action of the heart. Strong emetics must be used—apomorphine for the heart action and injections through the skin of atropine until 1/20 of a grain has been given.

Freshly ignited charcoal is given to absorb the poison; this is followed by oils. The intestine should then be washed out with an enema of warm water and turpentine.

In Mr. Chestnut's bulletin "Thirty Poisonous Plants", he says of phallin: "A large number of cases of poisoning have been attributed to this fungus in ancient as well as modern times. The symptoms are characteristic. A bad taste warns the victim and usually the first effects do not appear until from nine to fourteen hours after eating.

There is then considerable pain. There may be cramps in the legs and other nervous phenomena, even
lockjaw. In a few cases spasms have occurred. The pulse is weak, either quick or slow in action. The pupils of the eyes are sometimes dilated, abdominal pain is rapidly followed by nausea, vomiting, extreme diarrhoea, the discharges assuming the peculiar "rice water" condition characteristic of cholera.

The latter symptoms are persistently maintained, generally without loss of consciousness until death ensues as it does in from two to four days. There is no antidote known which will counteract the effect of this poison.

Helvellic acid acts on the blood corpuscles and the symptoms are similar to phallin poisoning. This poison is said to be soluble in hot water so if the mushrooms containing this are soaked in hot water there will be no danger experienced from eating them.

It is said that plants muscarine are used in Russia to produce intoxication. It is also said that the above mentioned poisons have been removed from plants by soaking in salt water and steeping them in vinegar, but W. S. Carter, M. D. says that soaking in vinegar for Amanita phalloa is the same as using that much water.

However, they are dangerous whether treated before eating or not; death has certainly been caused by these poisons.

In France mushrooms hold an important place as a
food and are cultivated in caves where thousands of pounds are produced daily. In Germany the school children are taught how to distinguish the edible from the poisonous. In England mushrooms are not used so extensively as in the before mentioned countries yet more so than in the United States. Many people here content themselves with canned mushrooms from France while use more delicious ones decay in the forests and meadows.

Mushrooms have been likened to beefsteak and oysters as a food high in proteins but they are composed largely of water. L.B. Mendel of Yale makes the comparison between ten pounds of mushrooms and the same amount of several vegetables, as follows:

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<th>Proteins</th>
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<th>Carbohydrates</th>
<th>Cost</th>
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<td></td>
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<tr>
<td>Beans</td>
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<td>.11</td>
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<td>.14</td>
<td>.33</td>
<td>200</td>
<td>11.7</td>
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<tr>
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<td>.18</td>
<td>.01</td>
<td>1.53</td>
<td>.10</td>
<td>325</td>
</tr>
<tr>
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<td>.18</td>
<td>.03</td>
<td>.48</td>
<td>2.50</td>
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As compared with other foods mushrooms fall short either in repairing the wastes of the body or of supplying energy and maintaining body heat. But they do act as a relish and aid digestion. It is said that if mushrooms alone are eaten excellent health will be
experienced. Mushrooms are classed with luxuries because of the high price for which they are sold or for the long walks necessary to secure enough for one meal. Mushrooms are thrown out of all classes but that of a relish. They may be prepared in so many appetizing ways and have such appetizing odors as to cause the flow of the digestive juices that they therefore hold a high place in the class of relishes.

Many people are withheld from eating mushrooms because they do not know them. I have tried to describe some of the common edible types so that one becoming familiar with them may eat them without serious results.

COMMON MUSHROOM.

Agaricus campestris.

The word campestris comes from capus meaning field and it is here that this mushroom is found. It grows most abundantly in the months of August and September. This mushroom may be relied upon for growth when cultivated. It is found on the markets canned and etc.

The color of the gills is at first pink and later becomes dark brown and then a brownish purple color which is due to the spores. The color of the pilers varies from white to drab. In young plants the pilers is attached to the stem by the veil but as it grows older the pilers expands becoming almost flat. The cap
is from two to five inches in diameter.

The stem is from three to four inches in length. It is solid or stuffed. The gills are not attached to the stem. The ring is situated about three fourths of the way up the stem. It grows directly from the ground and there is no bulb at the base or no sheath of scales. When looking for this mushroom it must be remembered that the gills are pink not white and that the taste is pleasant.

The spores are roundish elliptical, and a purplish brown color. The title of mushroom is often applied to this plant to the exclusion of all others. It is grown extensively in France, China, and Japan. It never grows in the woods and the plants do not grow in clusters but singly. The vitality of the mycelium is great. It is prepared for the market and with stard's drought. For this reason it is the species most commonly grown for the market.

THE SHAGGY MANE.

Coprinus comatus.

The word comatus comes from com meaning shaggy.

In the early stages this mushroom has the appearance of an egg. It expands somewhat, splitting the edges which gives it its characteristic shaggy appearance. This plant has a ring in the button stage but as the plant grows, the ring falls to the ground. The exterior of the buttons is mottled black and white. In the
early stages the cap, gills, and stem, are white, while the apex is dark. The cap is covered with scales.

The gills are long, narrow, and taper at the ends; they are free from the stem; their color is at first white, then pink, brown, and black, dripping ink. The stem is from three to eight inches long and is hollow and brittle. The spores are black and are shed in the liquid.

The shaggy mane may be found in shady places where the ground is rich. It grows from May to October. It is stronger than the field agaric when cooked. It is considered the best of all for eating purposes and is especially good for invalids as any one can digest it. It is considered best when fried or stewed. This plant may be known by its shaggy appearance and the scales and discolorations on the cap which is barrel shaped while in most other mushrooms it expands like an umbrella. A cord of mycelium runs through the hollow of the stem and the gills are not attached.
THE INK CAP.

Coprinus atramentarius.

Atramentarius means black ink. This plant occurs with the shaggy mane but it is thought by some to be less common. It has an oval shape and a darker color, also a shorter stem than the shaggy mane.

The pileus is oval shaped and the color varies from silver gray to smoky brown. In some forms the cap is smooth; in others there are scabs on the top caused by the clustering of turfts which give the plant a granular aspect. This is the way in which it most commonly appears. The edge of the cap is uneven. A delicate ring is formed where the cap is separated from the stem.

The stem is slender and is from two to four inches in length. It is hollow, smooth and easily separated from the cap. The spores are black and fall from the cap in the drops of liquid. This plant is found growing in lawns and grassy places. It usually grows in clusters of three or more but sometimes is found growing singly. It is called ink cap because the cap resembles an ink well and it melts in order to scatter the spores.

GLISTENING COPRINUS.

Coprinus Micaceus.

It is called Micaceus from micare meaning to glisten. The pileus is bell shaped with delicate scal-
es over the surface. It is very thin and of a light brown or tar color. Deep lines radiate to the margin of the piles. The margin of young specimens is wavy.

The gills are narrow, at first a white color then changing to pinkish and then to black. The gills of this plant, as is also the cap, are very thin compared to those of the shaggy mane and the ink cap.

The stem is slender, delicate, and hollow, and is from one to three inches long. For eating purposes this species is particularly good. It is found growing in clearings. Sometimes a colony of several hundred springs up from a stump. It will grow on logs and lawns but very rarely. Its chief characteristic is the shining scales on the cap which with the color and markings make it very different from other members of this group. In dry weather it remains firm but in wet weather melts into a fluid.

**THE FAIRY RING MUSHROOM.**

*Marasmius oreades.*

Oreades means mountain nymphs. It is called fairy ring because the plants grow in circles. Years ago the people in England and Ireland thought that the green growth where the mushroom grew in circles was caused by fairies dancing in rings on the lawn. The first year the fairy mushroom simply grows in a cluster. This seems to die down and the next year the plants
grow up around the edge of this, forming a small
ring and so on, each year the ring becoming larger.
When it is broken it is caused by something which has
cHECKED the growth of the mycelium.

The pileus is convex becoming flat. It has a dis-
Tinct knob in the center. The color is a tanish pink.
The gills are lighter in color and the spores are
white. The stem is solid, tough, and fibrous. The
gills are few and far apart, and are of a white or dull
yellow color. They are sounded near the stem. This
plant is very appetizing. It is small but grows in
great quantities. It grows in summer and autumn in
lawns and pastures where there is grass, and most
abundantly after a heavy rain.

THE CHESTNUT COLORED BOLETUS.

Boletus clintonianus.

This mushroom is different from any heretofore
described as it has pores instead of gills on the under
surface of the cap. To this type belong more edible
and larger mushrooms than to any of the others. The
pileus is convex, viscid, soft, chestnut colored or
reddish yellow. The flesh is pale yellow, changing
when exposed to the air to a less bright color. The
pileus is from two to five inches broad.

The stem is from two to five inches long and from
one to half to one fourth of an inch thick. It is slig-
htly thickened at the base. The annulus is white or
yellow. The spores are oblong, spindle shaped, and are of a yellow iron rust cast. The tubes are pale yellow becoming brown when bruised.

**Boletus clintonianus** grows in mossy or grassy places in the woods or in the open.

**BOLETUS GRANULATUS.**

This plant is about the same size as the chestnut colored *Boletus*. The color of the cap is a light dirty yellow when dry; and a kind of brown when moist. It is two or three inches broad; at first hemispherical the convex, covered with brownish color. The flesh is pale yellow. The stem is short has no veil, is thick, solid and from one to two inches in height. It is a pale yellow color above and white below.

The tubes are short and are joined to the stem. The open end of the tubes is dotted or granulated. They are at first white but later become a light yellow. The margin gives off a pale watery fluid which when dry gives the plant a granular appearance. The spores are a rusty yellow color. This plant grows in clusters in pine woods in the summer and even into late autumn.

**LYCOPERDON CAYATHIFORME** (Old Name)

*Calvatia cyathiformis.*

The peridium of this plant is large, top shaped and from three to six inches broad. The exterior is a whitish or pinkish brown while the interior is white. The outer coat is smooth and thin, peeling off readily.
It resembles a broad cup or urn. After a few days the interior becomes soft and of a yellowish color, and later develops a juice. This dries and the interior becomes a mass of dust like brown spores.

This species grows from the month of August to October. It is very common and can be found in meadows and pastures. None of the puff balls with a white interior are known to be poisonous. It is only when they are white and firm that they may be eaten. After the juice is developed they produce nauseoa.

THE GEMMED PUFFBALL.

*Lycopodium gemmatum.*

This puff ball is very common. It grows on the ground, on rotten tree trunks or in the open. The tops of the peridium is depressed, the case tapers causing the form to resemble a top. The base top of the plant is covered with long spines which stand erect. They are of irregular shapes, the color being white or gray with a tinge of red or brown. The large spines fall away leaving pale spots on the surface. The peridium is one to two inches in diameter and one to three inches in height.

The spores and fibers are of a greenish yellow color, later becoming light brown. The gemmed puff-ball may be known by the spines which cover its surface. The spines give the idea of gems, hence the name. It is thought by many to be the prettiest puff ball known. The specimens must be eaten when young.
Clavaria botrytes.

Botrytes means a cluster of grapes and the plant is so named because it grows in this shape. It grows from three to four inches high and is from three to six inches across. It branches repeatedly and the tips are dingy shades of white, yellow, and pink. The stem is short thick, and fleshy, and a sort of white color. The flesh is white as are also the spores.

This is a very common plant. It grows in the woods or open in wet weather. It is a great favorite in Europe. As the plant grows older the color disappears from the tips. The color and size depend on the soil in which it grows.

BEAUTIFUL CLAVARIA.

Clavaria formosa.

The word formosa is from formosus meaning finely formed. The plant is from two to six inches high and the trunk often measures one inch in thickness. The branches are numerous, crowded and divided at the ends into small yellow branches. It is very beautiful, tender and brittle. When very young the tips are sometimes bright red or pink but as it grows older this fades leaving them yellow. It is distributed widely and is found growing on the ground in the woods, sometimes in distinct rows. The beautiful clavaria though the most beautiful of this genus is not the
best, although the tenderest parts are excellent when thoroughly cooked.
The mushroom has been one of the neglected food plants of the United States but is now gaining more attention. Until recently the American people were content with the canned varieties from Europe while tons and tons of far better ones decayed in nearby forests; but, upon the discovery of edible qualities of these, interest increased and at present France is depended on no longer for the mushroom supply. Even yet, however, mushroom culture and the use of edible mushrooms for culinary purposes is far greater in the European countries and even in parts of Asia, notably Japan and China, than in our own country. In Japan the poor people use them as a means of subsistence and they can be bought as regularly in the markets as the common vegetables. So great is the interest Japanese and Chinese in them that vast amounts have been shipped to the Pacific coast for their consumption, while countless numbers of the same species went to waste in our own forests. For commercial purposes the Japanese grow several varieties in old decaying tree trunks and export large quantities to China. In one year this export amounted to 60,000 pounds.
European countries have special inspectors appointed to examine the imported mushrooms as they are landed and discard the poisonous ones. Quantities over ten pounds are taxed. The average quantity of mushrooms taxed in the decade beginning 1884 was about seventy thousand pounds.

The French are especially interested in mushrooms and grow them in great quantities in caves and old cellars, producing in some cases thousands of pounds daily. In Paris 1,300 men work under the city in the cultivation of edible mushrooms. The product is said to amount to millions of dollars in value in France alone. In Germany the cultivation of the mushrooms has a prominent place, so much so in fact that the school children are taught to distinguish several varieties. Great Britain's mushroom cultivation, though not so extensive as that on the continent is still more extensive than that of the United States. A factory in London produces 3,000 bushels of spawn or mycelium monthly and sells all of it. In Edinburg a tunnel three thousand feet long under the buildings of the city contains beds which produce five thousand pounds of mushrooms monthly with an average market price of eighteen cents a pound.

The increasing interest in mushrooms among the Americans lately has led to much inquiry into the methods of cultivation, especially by those who wish to cul-
tivate them on a small scale for home use. We have heard a great deal through the newspapers and other sources of the enormous profits gained from mushroom cultivation but this is confined chiefly to cultivation carried on in hothouses with flowers, in vegetable gardens, or in houses erected for other purposes in which they are not the chief crop. Where houses must be erected especially for this purpose, heating, materials and preparation of the beds taken into account and excepting time and labor, the profit is not larger than from hothouse vegetables such as tomatoes and lettuce.

The greater profit, perhaps is found in the most extensive cultivation in caves, tunnels and abandoned mines where houses need not be erected and where the temperature is favorable throughout the year for growth. The caves, cellars and other natural places selected should be dry, warm, dark and exposed to no drafts. In the above mentioned places the profit may be made greater as the environment is suitable for growth in the summer; when the mushroom market may be greatly controlled by the grower.

The varieties of mushrooms cultivated in Europe belong almost exclusively to the Agarics, being Agaricus campestris, arvensis, and villaticus. These species in France are grown in old caves in what are known as flat beds. The largest mushroom company at Ak-
Ron N. Y. also uses these beds. The beds of this company are situated in an old abandoned mine in New York and comprises from twelve to fifteen acres of available ground, of which about five are utilized in the cultivation and handling of the material. The beds are about sixteen feet long by four feet wide, the sides being about ten inches and resting on flat places on the bottom rock. They are then soiled, putting the soil in about 9 inches deep. The ten inch boards forming the sides keep the soil in position.

The other popular beds—the ridge beds and also the flat ones—are used in the cave cultivation by the Wheatland Mushroom Co. in Wheatland N. Y. In places where lumber is high priced the ridge beds are more desirable, as the side boards are left off, the beds being rounded to keep the soil in position. Some also think that these beds are more profitable as they allow growth (to appear) on the sides as well as the top. In favor of the flat beds it may be said that they are more quickly made and do not require so much manure which is quite an item when it must be purchased from city liveries.

When houses must be erected, they are of two different kinds: those largely above ground and those largely below ground. In order to control the temperature of the former the house must be especially constructed. Sometimes an air space is allowed between
the walls and the roof; sometimes a double air space from one foot to eighteen inches is erected over the roof, and other times the air spaces are filled with sawdust. The sides of the house are often banked with earth or built of stone and brick, to insure good ventilation, which is absolutely necessary to successful cultivation, special means must be provided. Protected openings or exits in the roof accomplish this. Sometimes there are ventilators along the side of the roof and also two rows of ventilators upon a single gable roof, which take the place of a single row of ventilators at the peak of the house. The ventilators are provided with shutoffs and can be regulated at will.

The usual type of house is long and rather narrow and high enough to permit three tiers of beds, the two on the sides being three beds high and the middle tier, four beds high, one above another. The house is usually fifty to one hundred fifty feet long by eighteen to twenty four feet wide. On the side the most convenient size for the beds is about three and onehalf feet wide thus enabling one from the alley to reach over the whole bed in picking, while the center beds are about seven feet wide. One inch boards of various kinds of lumber are used in making the bottom for the upper beds. The boards on the side of the beds are ten to twelve inches wide. The bottom bed is placed on the ground,
the other beds being built above it about three feet apart, supported by upright scantlings and cross boards. For heating purposes, if the culture is connected with a greenhouse the same heating plant may be used, but if not a small room is set apart for boiler room. The pipes are run just beneath the roof or just under the walks in the alleyways.

Some people make quite a profitable business by cultivating mushrooms in hothouses just beneath the beds of flowers. Care must be taken in watering to allow no more water than is needful to the beds that there be no surplus to drip onto the mushrooms below. Unoccupied cellars, sheds and out of the way places also may be used for mushroom culture. In cellars, if not convenient to have the lower bed of the tier on the floor, bed boxes from three to four feet or larger may be used. The boxes can be prepared outside and left until the manure odor disappears thus doing away with its presence in the cellars.

In Europe, garden and field culture is practiced to some extent, mushrooms being grown in the gardens with the vegetables. The pastures should be rich and well drained and spawned in May. The blocks of spawn may be inserted in T shaped openings about 8 or 8 inches apart. The crop then appears in the autumn.

The manure, which is to be used in the beds should be fresh, not fermented, and should contain some but
not too large a percent of straw. The best is obtained from horses fed with an abundance of dry and nitrogenous food. That obtained from horses fed on greens is not desirable. It is best to use the horse manure alone but it may be mixed with other. When the cultivation is carried on in a large way, arrangements can be made to get it fresh, by the carload, from city liveries. For curing the manure, arrange in piles about three feet deep by ten to fifteen wide and fifteen to twenty long. When the temperature rises to 130°F, turn well with a pitchfork so the middle is on the outside. This is continued, turning whenever the temperature rises to 130°F, until the manure is fermented and the temperature does not rise higher than 100-120°F. Then it is ready for the beds. The chief points to observe in curing the manure are: 1, Secure a thorough fermentation; 2, Do not let the temperature run too high; and 3, Do not let the piles become too dry. In about fifteen to twenty one days it is ready for the beds and in color is dark brown mixed with white and free from objectionable odors. Loose piles ferment quicker but the temperature also rises higher. When the pile gets too dry, water may be added, which increased the fermentation but also the rise in temperature. Care should be taken not to get the material too wet as the mycelium will not run in wet material.
In general there are three different methods of curing:

1. The slow method in which the temperature does not rise very fast, taking about four or five weeks, and the piles are turned about four or five times.

2. Rapid process, in which the piles are damper, and fermentation quicker, requiring sometimes two turnings a day. This takes about 1 week. Between the slow and quick processes the curing may extend from one to five weeks.

3. In this method the manure before curing is mixed with about one fifth the amount of garden soil and allowed to ferment in the beds. Any one having enough knowledge to know how firm the bed should be made to prevent a too rapid rise of temperature could use this method with success and save much labor, time, and expense.

In most cultures, except in cave culture, rich loam soil or rotted sod is mixed in with the manure during the curing. A layer of manure is put on the ground, then one of loam and so on till the pile is built.

At the last turning another mixture of soil is added, making about one fifth of the cured material soil.

To make the beds, the material is brought in and distributed in long windrows on the ground; the workmen then place a rough wooden frame at the head of the
windrow and fill the frame with the material by means of pitch forks. Frequently the material is pushed down with the back of the forks and after several inches have been distributed in this way the workmen tramp it. This is continued till the bed is about seven inches deep. It is then left till the temperature sinks low enough for spawning. The temperature always rises the first few days after the construction of the beds and the spawn should not lie planted until the temperature conditions are suitable. After the first bed is finished the workmen bring another frame like the first and place it where the material which was used to fill the first one had been, and fill as before. This operation is continued down the windrow until all the material is gone leaving the filled beds in its place. This method saves a good deal of time and is easily carried out. Some growers think the harder the material is packed the better the result will be, which has led to the discarding of tiers of beds by some as these are so hard to pack. On the other hand others pack their material more loosely and have as good results.

The ridge beds are made without the board support, the tops and sides being rounded off. In some cases these are made by placing on the ground wooden frames, with the sides closer together at the top, filling partly with the material then lifting the frame up the side of the heap—keeping the material pressed down—
until of the desired height. Remove the frame; round off the top.

Beds are sometimes made in pyramidal shape, built up about three feet from a cask bottom which is about two feet six inches in diameter. In spawning these beds, the spawn should be placed about sixteen inches apart and one and one fourth inches deep. For home cellar culture, half of an old barrel sawed apart cross-wise, makes a good inexpensive support for a bed. The bed is ventilated by holes in the bottom of the barrel. A thin layer of soil is spread over the bottom and when the barrel is half filled with well pressed down, well cured manure, small pieces of spawn are inserted as in other beds and the whole covered with manure, well pressed down and rounded off at the top of the half-barrel. Beds may also be made upon shelves; placed around cellars, stables, or other suitable places.

The difficult point to determine is when to plant the spawn. The temperature of the material should be between 70° F and 90°. The spawn should be planted at about 80 or 85° F. A high temperature favors the growth of molds and bacteria, which destroy the spawn or growing crop. Many of the successful growers put more stress on the "ripeness" of the manure, which must produce a sort of mushroom or sweethish odor, than they do on the temperature. Moisture is another important factor to consider. Either too dry or too
moist material spoils the crop. Some test it by squeezing near the ear. If a sound as of water is heard it is too wet. It should slightly expand upon releasing but if it falls to pieces it is too dry.

To make a success of mushroom cultivation good spawn must be used for spawning the bed. Spawn is the commercial name for the mycelium or threadlike structure growing in white thready or moldy masses in old manure piles, horse droppings and rotted trees, and the substance in which it is kept. The spawn of a mushroom corresponds to the root, stem, and leaves of a tree and the mushroom to the fruit. On the underside of mushrooms in the fills or tubes are formed the spores from which the mycelium or spawn originates.

There are three kinds of spawn: 1 Virgin or natural spawn, growing naturally in suitable environment such as manure heaps and rotted trees; 2, Brick or English spawn, placed on the market by the English. 3, Flake spawn or French commercial spawn.

Natural spawn is the best spawn and should be used whenever possible. It may be dried by taking up the manure in which it is found, placing in some dry, well ventilated place and allowing the moisture to escape.

The brick spawn is so called because it is made in the form of bricks, usually five by eight by one and one half inches, which weighs about one fourth of a pound dried. The bricks are made from equal parts of horse dung, cow dung, and loam, or, the principal
part horse dung, one fourth cow dung, and the remainder loam. The mixture is pressed into shape, half dried and a small piece of spawn—virgin if possible about an inch square is placed in the middle and the bricks put in hot beds. Care must here be taken to have the heat circulate evenly and not let it rise higher than 60° F. When the bricks are thoroughly permeated with a fine whitish, moldy growth they are taken out and put in some dry, warm place to finish drying. These bricks will keep for as long as fourteen years but it is better not to use them after the second or third year. When buying brick spawn be sure it is not very old and see that it has a fine growth of moldy, thready, mycelium; unless it has it is not good.

Flake or French spawn is prepared as above, only in loose, irregular masses six to eight inches in diameter. To prepare it spawn a bed with virgin spawn if possible and when a good growth of mycelium appears, take it up and dry. In flake spawn the mycelium is easily accessible to the air and destructive bacteria and does not keep well. It is not only transplanted easily and can be used to advantage only when fresh.

After the beds have been made up and are of the right temperature—about 80-85° F. they are inoculated with spawn. Small openings are made in the beds from six to nine inches apart, in which are inserted pieces of spawn. With manufactured spawn the pieces are about two to three inches in diameter, but a large quantity,
sometimes a handful, of the virgin spawn must be used. The beds are then firmly transplanted so as to bring the soil in close contact with the spawn. Shortly afterward—with some growers immediately, others several weeks—the beds are covered with about two inches of rich garden soil. After about ten days the beds are examined and if a large quantity of whitish threads are seen through the soil the spawn is good, but if not the spawn is rotten and should immediately be taken out and replaced with better. If the spawn is good, the beds should be covered to keep in the moisture. Litters of straw, or excelsior, or old mats held in place with bricks, may be used as a covering. If the beds become too dry, sprinkle slightly but do not saturate. The mycelium will not grow in saturated material.

The mushrooms begin to appear in about a month, when the bed should be lightly sprinkled; gradually increase the amount of water to bring up the least matured buttons. The mushrooms are picked usually once a day and in the morning. When the room is quite warm causing the mushrooms to open quickly, they should always be picked before fully expanded. Others, kept in a lower temperature and allowed to grow as long as possible, possess the good qualities of being more firm, thicker, and larger than those grown at higher temperature and picked sooner. It needs a careful hand
to pick the mushrooms. Carefully twist the stem from
the soil and fill the hole left with fresh soil. Re-
move the pieces of roots and stems and keep the beds per-
factly clean. A good crop will yield from one half to
two pounds per square foot. The mushrooms are assorted
as to size, color and firmness and packed in one, two,
or five pound boxes or baskets for the market.

After the first crop some cultivators grow a sec-
ond crop on the same material, resoiling by placing
about two inches of soil over the old soil. The beds
are then watered, sometimes with luke warm water con-
taining a small quantity of nitrate of soda. Most
 growers however, remove all the old soil, which is
valuable for gardening purposes, and thoroughly clean t
the houses. Some even whitewash the walls and floors
in order to remove from the house mushroom pests and
insects.

For packing, the mushrooms are selected as to size
and placed in suitable baskets. If a large quantity is
to go at once to a customer, they are packed in large
baskets, otherwise in small ones. ..usual u the basket
is lined with two or three thicknesses of paper, the
mushrooms are packed in, and the surplus paper folded
over the top. Over this are usually fastened thin
strips of board, though when sent direct to the cus-
tomer pasteboard is used in place of the board. Some
growers give no attention to packing, others do, es-
pecially if the mushrooms are opened. They are arrange}
gills down, making a pretty picture on top when so arranged.
Preservation:

We have long heard mushrooms extolled as great food products and in some cases, even as having as much nutriment as beefsteak, oysters, and vegetables. Analysis of the edible varieties of mushrooms do not bear out those statements but class them as relishes. As relishes and aids to digestion these delicacies cannot be overrated but are fully as valuable on the table as fruits and serve the same purposes. But because they are expensive delicacies many people cannot afford to use them, except during those seasons when they can be gathered wild. In those seasons tons and tons of them go to waste because the supply is greater than the demand. The people have not yet learned a very simple but important secret which they have long made use of in connection with fruits. With the modern process of canning, mushrooms, as well as fruits, vegetables, and meats can be preserved, keeping almost intact the flavor, shape, and color, and not injuring at all their food value.

The common field mushroom, Agaricus campestris, and other rather solid species can better than more deliquiscent ones. For canning or preserving in any way, select the very nicest specimens, special care being taken to reject the larvae or insect infested ones. For canning, the buttons, especially of Agaricus campes-
tris, are best as they remain white and firm. To clean the buttons, wipe them with cloth or peel. Cut off the stem near the cap. Place in an iron or granite kettle and heat without water until shrinkage ceases. If desirable stew in milk, before or prepare in any other way for the table, before canning. Have the glass jars and lids or tin cans thoroughly sterilized by heating in boiling water. Fill the jars with the mushrooms, pouring the liquid over until the jars are thoroughly filled. Place in a boiler or other vessel containing a small amount of hot water and an asbestos sheet or excelsior in the bottom to prevent contact between the jars and the vessel. Place the lids loosely on the jar, or with a tin can seal, leaving only the vent open. Cover and allow the water to simmer half or three fourths of an hour. Upon removing, immediately seal the jars or cans tightly, being sure that no air can penetrate. Set aside for twenty four hours and heat again as before, heating one hour this time. To be quite sure that they will keep, heat one hour again the third day twenty four hours after the second heating. This method though come what long, keeps the mushrooms is as nearly a fresh condition as is possible. Apply heat and they are ready for the table.

Although the mature mushrooms, those with fully expanded caps, are not desirable for canning as they turn black, become mushy, and shrink much, without
altering the flavor, however, they may be used with
great success for drying. For this method of preservat-
ion, select dry specimens with firm and fully expanded
caps. Wet specimens will not dry. Clean or peel,
place on boards gills up and expose to sun or dry heat.
Do not leave out during the night as they absorb moist-
ure. Turn every day at first. When they feel dry
to the touch put in the oven and finish. While brittle
grind to a powder and place in fruit jars well sealed
or well stoppered bottles. Keep in a dry warm place.
This powder is excellent for use made in soups, fritters,
or pates, also for seasoning, and with milk makes a
very palatable gravy and is delicious served over
juicy beefsteak. If it is not desirable to grind them
the dried mushrooms may be kept whole by keeping in
some warm dry place. By soaking first they may be
used in the same manner as the fresh ones and have as
good a flavor but are rather tough. It is desirable to
select good sized mushrooms for drying. Edible boletic
may be dried by removing the pores, stem and all dirt,
slicing, stringing and hanging from the ceiling like
apples. The English method for drying is as follows;
"Take the mature but not old plants; remove the stems,
slice, string or skewer slices lightly and expose to a
current of warm dry air. When dry and shriveled pack
tins with spices at the top and bottom. When wanted for
use soak the slices in tepid water for some hours—Cook."
The Russians dry the mushrooms whole, stem and all, and string up through the stem.

When the sun is not hot enough to dry the mushrooms, artificial heat must be resorted to. Racks around a stovepipe, shelves near a stove, radiators or warming ovens are good for this purpose. Mr. Atkinson used, with great success, a tin oven two by two feet and two or several feet high with a side hinged door, fitted with movable shelves of wire netting or perforated tin. A vent at the top and holes around the side at the bottom furnish ventilation. This may be heated with a lamp, care being taken not to get the stove too hot. Another method employed by Mr. Atkinson was very successful and is as follows; over an old cookstove were placed two wire screens about three by four feet, one above the other, the lowest being about one foot from the top of the stove. To keep the plants from crumbling they must be placed so that air can circulate under and around them.

The older mushrooms and stems made up very well into a delicious catsup. One of the best recipes for that purpose is as follows; Place the mushrooms or stems in an earthen jar and stir salt into them. After standing twelve hours mash and strain through a cloth; for every quart of liquid add one half teaspoon ground ginger, and one half teaspoon black pepper. Boil in a granate kettle until at least one third has evaporated.
Pour in hot sterilized bottles, cork and when the cork is dry but before the bottle is cool, dip the cork and part of the bottle neck into hot canning wax. Use small bottles so the contents can be used quickly after opening.

**CATSUP.**

Place large ajarics layer by layer in a deep pan, salting each layer slightly. The next day stir well so as to mash and extract their juice. On the third day, strain the liquor, measure and boil for two minutes. Then to every pint of liquor add half an ounce of black pepper, one fourth ounce bruised ginger root, a blade of mace, a clove or two and a teaspoon of mustard-seed. Boil for one half hour; put in two or three bay leaves and set aside till quite cold. Pass through a strainer and bottle, cork well and dip ends in resin. A very little Chili vinegar is an improvement and some add a glass of port wine or strong ale to every bottle. Care should be taken that the spice does not overpower the true agaric flavor. A little of the pure liquor should be kept back to guard against this.

**CATSUP.**

Break the mushrooms into bits and place in a stone jar, with an ounce and a half of salt for every quart. Let stand in a cool place for three days, stirring several times a day. On the third day put over the fire
in a porcelain kettle and heat slowly. In about half an hour the juice will flow freely, when strain through a hair sieve, return to the fire and boil twenty minutes. Measure and to each quart allow an ounce of ginger root, blade of mace, bay leaf, pinch cayenne, ounce of allspice and an ounce of black pepper; boil down to one half the quantity, add one teaspoon of best brandy to each one half pint. Bottle. Cork and seal with wax or rosin.

Pickled mushrooms keep quite well and are very good. One way to prepare them is as follows;—Use a number of small firm pasture mushrooms of the same size. Throw for a few minutes into cold water, drain, cut off the stalks and rub off the outer skin with a moist flannel dipped in salt. Boil the vinegar, putting in each quart two ounces of salt, half a nutmeg grated, a little mace and an ounce of white pepper corns. Cook the mushrooms for ten minutes in the vinegar. Then pour into small jars equally dividing the spices. Let stand a day. Cover.

PICKLED MUSHROOMS.

Select one half peck of sound specimens of Agaricus campestris, Lepiota procera, Hypholoma fascieularis Clitocybe multiceps, Russula virescens. Cut off the ends of the stems, rub. Throw them in one part milk to four parts water. Drain and place in a stew pan. Sprin-
kle with salt, 1/2 gallon to one half peck of mushrooms. Cover, and put over low fire for five minutes to draw out the water. Cut on coarse cloth and drain till cold.

**To Prepare the Pickle.**

Take one half gallon of not too strong vinegar, two ounces of mace, one fourth ounce cloves, one half pound salt, one teaspoon red pepper and one nutmeg cut in slices. (To slice a nutmeg, boil in vinegar slice while hot) Put in a jar covered with a wet cloth and keep the cloth wet. Place over a slow fire, cook as long as the acid is prominent and no longer. Take small wide-mouthed bottles, fill with the mushrooms, pour on the pickle until the bottle is filled. Tie down tight.

**To Pot Mushrooms.**

The small, open mushrooms are best for this. Clean, put into a stew pan a quart of mushrooms, three ounces of butter, two teaspoons salt and one half teaspoon cayenne and mace mixed, and stew for ten or fifteen minutes till the mushrooms are tender. Take them carefully out and drain. When cold press into small pots and pour clarified buttered over them, in which state they will keep for a week or two. A cover of writing paper and melted suet will preserve them for weeks if in a dry cool place.

**RECIPES.**

When the mushrooms are collected in the field,
clean as well as possible, keeping gills downward so dirt will not fall on them. If the stem is hard, tough, or wormy reject it, otherwise it is good made into sauces or stews. Keep the different species separate so the flavors will not mix. If not ready to cook when collected keep in the icebox but it is better to cook immediately as they decay very rapidly. Decide on the method of cooking your mushrooms by an observation of their characteristics. If thin, juicy, or tender five or ten minutes slow stewing will be ample; if thick, dry, or tough, from thirty to forty minutes will be required. After cooking they may be seasoned to taste and served as one chooses. The simpler recipes, those which retain the flavor, are the best. Some think spices destroy the true flavor of the mushroom. When a mushroom has good body but little flavor it may be made delicious by cooking with another species of higher flavor. The gills grow darker and the flavor increases as the spores ripen. They are in good condition up to the time the gills begin to grow moist and too soft. Do not wash more than necessary as water washes away the flavor and do not peel; a great amount of flavor lies in the skin. Some writers have said that if poisonous mushrooms are soaked in salt and vinegar over night the poison is destroyed and some will never eat a mushroom unless first treated in that way. A story is told of an old negro cook in Washington D. C. who cooked the deadly
Amanita by first soaking over night in vinegar and salt and preparing with vinegar for the table. These people were in ignorance of the poisonous nature of the Amanita and though eating heartily of it, had suffered no evil result from it. The authenticity of these statements is questionable.

TO COOK AGARICUS CAMPESTRIS.

S T E W E D.

Remove the stems and stalks from half grown specimens. To each pound allow two ounces of butter (about 4 tablespoons level full) when the butter is melted throw in the mushrooms and sprinkle over a teaspoon of salt. Cover to keep in the flavor. Cook very slowly for twenty minutes or until they are tender. Mix a rounding tablespoon of flour and a little milk. When smooth, add enough milk to make one gill. Stir this into the mushrooms, add salt, pepper—white pepper—, stir carefully until boiling and serve at once. This makes a fairly thick sauce less flour is required when served as a sauce over chicken or beefsteak. Another recipe allows less butter to stew them in, and with the pepper adds a little lemon juice. Mace, nutmeg or catsup may also be added if desirable.

B R O I L E D.

Remove the scales and stalks; wash; dry well; salt and pepper and place a small piece of butter in the center of each gill-side. Broil lightly skindown,
turn and broil quickly on gill side about two minutes. Serve on hot buttered toast. Bacon toasted over the mushrooms improves the flavor and saves butter.

FRY

Lay them in a frying pan in which butter has been heated boiling hot. Fry five minutes, serve on a hot dish or buttered toast, pour over them the sauce made by thickening the butter with a little flour.

WITH BACON.

Fry a few rashers of nice breakfast bacon. When nearly done add a dozen or so of full grown mushrooms and fry slowly till cooked. They will absorb all the fat of the bacon and seasoned with salt and pepper form a most appetising dish.

IN THE CHAFING DISH.

Cut the mushrooms into slices and to each pound allow two ounces of butter. Put the butter in a chafing dish and when hot add the mushrooms. Season with a teaspoon of salt. Cover and cook slowly five minutes stirring frequently; then add one gill of milk. Cover again, cook three minutes add beaten yolks of two eggs, a dash of pepper and serve at once. They must not be boiled after the eggs are added.

COTTAGERS' PROCEBUS PIE.

Cut fresh, firm Agarics into small pieces and cover the bottom of pie dish. Pepper, salt, and place on small shreds of fresh bacon, then put in a layer of
mashed potatoes and so on until the dish is filled, having the mashed potatoes for a crust. Bake well for half an hour and brown in a quick oven or before a quick fire.

Pâté Pâté

Wash carefully a half pound of mushrooms, chop fine; put into a sauce pan with a tablespoon of butter and if you have it, a cup of chicken stock; if not, a cup of water. Cover and cook slowly for thirty minutes. Put one pint of milk into a double boiler; rub together one tablespoonful of butter and two tablespoons of flour. Add the milk, stir and cook until thick; add the mushrooms and press the whole through a sieve. Season with salt and pepper.

Cream of Mushroom Soup.

This is made as puree save that one quart of milk is used instead of a pint with the same amount of thickening and the mushrooms will not be pressed through a sieve.

Baked.

Peel the tops of twenty mushrooms cut off the stalks and wipe carefully with a piece of flannel dipped in salt. Lay the mushrooms in a tin dish; put a small piece of butter on top of each and season with salt and pepper. Bake in the oven from twenty to thirty minutes. When done, arrange them high in the center of a very hot dish, pour the sauce round them and
serve quickly and as hot as possible.

C O P R I N U S .

Baked.

Being soft and juicy they must be handled with care and are much better cooked with dry heat. Remove stems, wash carefully, throw into a colander and drain; arrange in a pan. Dot here and there with bits of butter, allowing a tablespoon for each fourth of a pound of mushrooms, and dust with salt and pepper. Run in a very hot oven and bake for thirty minutes. Dish in a heated vegetable dish; pour over them the sauce from the pan. Serve on toast if desirable.

STEWED.

Wash, dry. Put into a large flat pan allowing a tablespoon of butter to each half pound mushrooms, sprinkle with salt and pepper, cover pan and stew fifteen minutes. Moisten a tablespoon of flour in a little cold milk; when smooth add a cup cream or milk. Push the mushroom to one side; turn in this mixture and stir until boiling. Do not stir the mushrooms as they will fall apart and become unsightly. Dish them; pour over the sauce and serve at once.

LEPIOTA.

These mushrooms, having very thin flesh, and deep gills must be quickly cooked to be good.

BROILED.

Remove the stem, take the mushroom in your hand,
gill down, and with a soft rag wash carefully the top, removing all the scales. Put the mushrooms into a baking dish or broiler. Melt a little butter, allow to settle, take the clear oily part from the top and baste the mushrooms lightly, ill side up; dust with salt and pepper. Put the mushrooms over a quick fire, skin side down, for just a moment; then turn and boil an instant on the gill side and serve at once on a heated plate. In this way Lepiota procer is the most delicious of all mushrooms but it must be cooked quickly and eaten at once. All the edible forms may be cooked in this way.

These are perhaps the best of all the mushrooms for drying and add much to an ordinary meat sauce.

R U S S U L A.

SALADS.

All in this group may be cooked alike. Remove the stems, wash, holding the gill side down and drain in a colander. They are nice broiled or baked or may be chopped fine and served with mayonnaise dressing, stuffed into peeled tomatoes, or with mayonnaise on lettuce leaves, or mixed with cress and served with French salad dressing, as salads. It is well to peel all mushrooms if they are served raw.

B A K E D.

Follow the recipe for agaricus campestris. In this way they are very nice over the ordinary broiled steak.
WITH STEAK.

Wash; dry; place gills up in a baking pan; pour over a little melted butter, dust with salt and pepper and put into an oven for fifteen minutes. Broil the steak and put the plate over hot water to heat. Put a tablespoon of butter, a little salt, pepper and some finely chopped parsley on it. Take the mushrooms from the oven, put some in the bottom of a plate, dish the steak on top, putting the remaining quantity over the steak. Add two tablespoons of stock or water to the pan in which they are baked; boil; scraping all the material from the pan, baste this over the steak and serve at once.

Agaricus campestris and many other varieties may be cooked in the same way.

BOLETI.

These are more palatable baked or fried. Fried—wash the caps and remove the pores. Dip the caps in beaten eggs, then in bread crumbs, and fry them in smoking hot fat; oil is preferable to butter, even suet would make a dryer fry. Serve at once as you would eggplant.

BAKED.

Wash and remove pores; put the mushrooms into a baking pan; baste with melted butter, dust with salt and pepper, and bake in a moderately hot oven three fourths of an hour. Dish in a vegetable dish; put into
pan in which they were baked, a tablespoon of butter. Mix carefully with a tablespoon of flour and add one half pint of stock, one-half teaspoon salt and a dash of pepper; pour over the mushrooms; serve.

**CLAVARIA**

**Stewed.**

Wash, separating the bunches and chop or cut rather fine, measure and to each quart allow one half pint Supramensauce. Throw the clavaria into a saucepan, cover and allow to stew gently for fifteen minutes while you make the sauce. Put a tablespoon of butter and one of flour in a saucepan; mix and add half a pint of milk or chicken stock or both mixed; stir until boiling; take from fire, add a teaspoon of salt/ a little pepper and the yolks of two eggs. Take the clavaria from the fire and when cool stir into the sauce. Turn into a baking dish, sprinkle the top with bread crumbs and brown in a quick oven. Do not cook too long as it will become watery.

**PICKLED.**

Wash clavaria without breaking apart; put into steamer, stand steamer over a kettle of boiling water and steam rapidly, i.e. keep the water boiling hard for fifteen minutes. Take from the fire; cool. Put over the fire sufficient vinegar to cover the given quantity; to each quart allow two bay leaves, six cloves, a tablespoon of whole mustard, and a dozen pepper
corns. Put into glass jars. Bring vinegar to the boiling point and pour it over; seal and put aside. This may be served alone or as salad on lettuce leaves with French dressing.

**PUFF BALLS.**

To be eatable the puff balls must be perfectly white to the very center.

**FRY.**

Pare off the skin, cut into slices, dust with salt and pepper. Have ready in a large shallow pan, a sufficient quantity of hot oil to cover the bottom. Throw in the slices and when brown on one side, turn and brown on the other. Serve at once on a heated dish.

**STEAMED.**

Cut in dice shaped pieces; stew for fifteen minutes in a little water; pour off the water, dust with a little flour, add a small quantity of cream or milk, butter, salt and a little parsley. Stew slowly for five minutes. Serve.

**OMELET.**

Pare and cut into blocks sufficient puffballs to make a pint. Put a tablespoon of butter into a sauce pan. Add puffballs, cover and cook ten minutes. Beat six eggs without separating until thoroughly mixed but not too light; add the cooked puff balls, a level teaspoon of salt and a dash of pepper. Put a tablespoon of butter in an omelet pan; when hot turn in the egg mix-
ture; shake over the hot fire until the bottom has thoroughly set, then with a limber knife, lift the edge, allowing the soft portion to run underneath; continue this operation until the omelet is cooked through, fold and turn on a heated dish. Serve at once.

Other delicate mushrooms may be used in this way.

WITH AGARICU CAMPESTRIS.

As the flavor of the agaric is rather strong and that of the puffball weak, they are both better for mixing. Take equal parts of each; pare and cut the puffballs into blocks; to each half pound allow a tablespoon of butter. Put the butter in a saucepan, add the mushrooms, sprinkle over the salt; cover and stew slowly for twenty minutes. Moisten a tablespoon of flour in a half cup of milk, add to the mixture, stir and cook for just a moment. Add a dash of pepper and serve in a heated dish.

M O R C H E L L A.

Baked.

Select twelve large sized mouls; cut off the stems and throw them in a saucepan of warm water; let them stand for fifteen minutes; then take them on a skimmer one by one, and drain carefully. Chop fine sufficient cold boiled tongue or chicken to make one cupful; mix with an equal quantity of bread crumbs and season with not more than ten drops of onion juice and a dash of pepper. Fill this into the mushrooms, arrange neatly in a baking pan, put in a half cup of stock and
a tablespoon of butter, bake in a moderate oven thirty minutes, basting frequently. When done dish neatly. 
Boil down the sauce in the pan until sufficient to baste once. Serve at once.

FRIED

Cut off stems of large sized morels. Wash. When the butter in the frying pan is hot throw in the mushrooms and toss until thoroughly cooked. Add half pint of milk or stock; cover and cook slowly twenty minutes. Dust with salt and pepper and serve in a vegetable dish. Garnish with sweet Spanish peppers that have been boiled until tender.

GENERAL RECIPES.

To Serve with a Boiled Leg of Mutton.

Wash and dry. Dip each in flour, being careful not to get too much on the gill side. In a saucepan have a little hot butter or oil; drop these in, skin side down; sprinkle with salt and pepper. After they have browned on this side brown on gill side. Add a half pint of good stock; let simmer gently for fifteen minutes. Take up and dish around the mutton. Boil down the sauce, pour it over, and serve at once.

Sauce for Game.

Wash well one pound of fresh mushrooms; dry and chop very fine. Put them into a saucepan with one and a half tablespoon of butter; cover and cook slowly for eight minutes; then add a half cup of fresh rubbed
bread crumbs, a half teaspoonful of salt, a salt spoon of white pepper; cover; cook again for five minutes; stir, add a tablespoon of chopped parsley and, if you like, two tablespoons of sherry. Turn into a sauce boat.

OYSTERS and MUSHROOMS.

Wash and remove the stems from a half pound of fresh mushrooms; chop fine; put into a saucepan with a tablespoon of butter, salt and pepper; cover and cook over a slow fire for ten minutes. Throw twenty five perfectly washed perfectly dry, good sized fat oysters into the mushroom mixture. Pull the saucepan over a bright fire. Boil, stirring carefully for about five minutes. Serve on squares of carefully toasted bread.

TOMATOES STUFFED WITH MUSHROOMS.

Wash perfectly smooth, solid tomatoes; cut a slice from the stem end, and remove carefully the seeds and core. To each tomato allow three good sized mushrooms; wash, dry, chop fine, and stuff into the tomatoes. Put a half saltspoon of salt on the top of each and a dusting of pepper. Into a bowl put one cup of soft bread crumbs; season with half a teaspoonful of salt and a dash of pepper; pour over a tablespoonful of melted butter; heap this over the top of the tomato, forming a sort of pyramid, packing in the mushrooms; stand the tomatoes in a baking pan and bake in a mod-
erate oven one hour. Serve at once, lifting them carefully to prevent breaking.

BAKED ON TOAST.

Bake under a glass or basin on toast along with scalded or dopped cream or a little melted butter and salt and pepper to taste. Bake about fifteen minutes in slow oven or before a fire. When they are taken up do not remove the glass for a few minutes; by that time the vapor will have condensed and gone into the bread.

CRUSTS of MUSHROOMS.

Cut into small, even-sized squares a pint of selected mushrooms; stew in a little water till done. Add two ounces of butter and one teaspoonful of salt and one half teaspoon pepper. Wet a teaspoonful of flour with two gills cream and mix with beaten yolks of two eggs. Add and mix well with the mushrooms.

Cut the upper crust from small rolls. Scoop out the inside of both parts, brush with melted butter and brown in the oven. Fill with the mushrooms, place on the top and serve. Or serve in paper cases or pastry shells.

CROQUETTES.

To one pint well cooked mushrooms, add two hard boiled eggs, a sprig of parsley, pepper and salt. Chop all very fine, then take two level tablespoonful of flour. Put over the fire with the mushrooms and eggs. Mix thoroughly together, set aside to cool. Shape,
dip in egg and bread crumbs and fry in deep fat.

DEVILED TOADSTOOLS.

Prepare the mushrooms as for pathes; add the yolks of two hard boiled eggs to each pint of mush-
room, a pinch of red pepper, a little chopped parsley. Serve hot or cold in the halves of the egg whites, nested among green.

A CAMP BAKE.

Cover the bottom of a tin plate with c ps, spore surface up. Sprinkle with salt and pepper and place a bit of butter on each. Put another tin plate on top, set on coals or a heated stone for fifteen min-
utes. Eat.

A HUNTER'S TOAST.

Carry a vial of olive oil or a small can of butter, some pepper and salt mixed. And edible toad-
stool found, collect a few dry twigs, fir them. Split a greenstick at one end; put them in the mushroom in the cleft, hold it over the fire; oil or butter, season. Eat form the stick.

CANNED MUSHROOMS SAUCE.

Cook together until light brown in color, two tablespoonsful each of butter and flour. Add a can of butter mushrooms, with the water it contains and a cupful of water or broth. Simmer five minutes, stir-
ing meanwhile, season and serve. The flavor is more distinct and pronounced if the sauce is seasoned only.
With salt and pepper mixed.

**BOLETUS EDULIS SOUP.**

(As made in Hungary)

Dry the Boleti in the oven. Soak in tepid water.

Thicken with toast bread, till the whole is of the consistency of a puree, then rub through a sieve, throw in some stewed Boleti, boil together and serve with the usual condiments.
CONCLUSION.

On account of the very dry spring we have had it has been impossible to do any practical or field work worth mentioning. However we have read the great authorities on mushrooms and put their work in a condensed form in our own writings which we hope will make them not uninteresting. At a future time, if possible this work will be extended. We have covered all the phases needed in a working knowledge of mushrooms and have described the most common varieties of them, also giving a number of the best ways for cooking.