

out by any reputable manufacturer and labelled U. S. P. should be acceptable. Also why the necessity of going to court to prove that hexamethylenamine is the same as the proprietary preparation? If on the other hand the proprietaries are advertised as being identical with the U. S. P. the results obtained should be the same, and clinicians should not be disappointed, as they frequently are.

What requirements are necessary in a preparation to make it official in the U. S. P. instead of the N. F.? Why is Elix. Aromatic in the U. S. P., and the complete line of similar preparations, equally as important, in the N. F.?

The value of the coal tar products is an established fact, but there is no effort on the part of the U. S. P. to introduce or do research work on these, and with the exception of the introduction into the book of a few products upon which the patent rights have expired, there has been, not even a feeble attempt to offset the manufacturer in this direction and help the retail man so that he does not have to pay a most exorbitant price for something, of doubtful as well as known value, whose popularity is obtained primarily through good advertising.

It is time the U. S. P. became modernized, and since it has duplicated so many preparations of the manufacturers, it might be well to take a few hints as to their methods of creating a demand for the products by letting the physician know that the book contains all that is up to date and that the preparations are thus standardized and officially guaranteed.

Also, that the tests, methods of preparation, and general dispensing notes be made so explicit, that all pharmacists can with ease produce a uniform product. Then will the legitimate work of the true pharmacist be restored, and the manufacturing man no longer usurp it, nor destroy the ethical relations of pharmacy and medicine.

Our stores will resume their proper position in the mercantile world and many of the sidelines now indispensable through lack of real pharmaceutical business, will be discontinued not only to the advantage, but with the hearty approval of pharmacy.

---

#### THE CULTURE OF THE EDIBLE MUSHROOM (AGARICUS CAMPESTRIS) AS A HOBBY FOR THE RETAIL PHARMACIST.\*

---

A. J. KLINE, MINNEAPOLIS.

---

Before relating my own experience in connection with the study and culture of the mushroom, it may be well to briefly refer to the subject in a general way.

When one asks the question as to which wild mushrooms are safe to eat and which are poisonous, a very common answer is that they may be divided into two classes, first those which are "Deadly Poisonous!" and second those which will "Kill Sure!" The average person is not inclined to test the edibility of the numerous wild sorts, and those who are possessed of some knowledge concerning those suitable for the table will usually shun inquiries or answer "yes" or "no."

---

\* Read before the January meeting of the Northwestern Branch, A. Ph. A.

These quite general conditions are undoubtedly the prime cause for the limited use of this fine food. Most people do not realize the great annual loss of food from the non-consumption of the edible fungi. The fact that the average person is not able to distinguish between the different varieties and hence eats none at all is without question a very fortunate restriction.

As a matter of fact there are very few, *very poisonous* mushrooms and these belong to the genera known as *Amanita*. Those of this group which are most toxic are *Amanita phalloides*, *Amanita verna* (said to be a form of *A. phalloides*), *Amanita muscaria* and *Amanita solitaria*. The last named species is said to be edible, but according to Clements "it is dangerous on account of its resemblance to the poisonous *Amanitas* and every one should avoid all risks by leaving it entirely alone."

There are a number of fungi which while not deadly poisonous contain power-



Fig. 1. The common wild mushroom (*Agaricus campestris*). Fully developed fruit bodies, the gills are clearly seen as is also the membranous ring or annulus on the stem.—  
(After Freeman in Minnesota Plant Diseases.)

ful emetic principles. These include such as *Lepiota morgani* and *Clitocybe illudens*. It is interesting to note in this connection that a peculiar idiosyncrasy exists in certain people who are not affected by the emetic principles.

Altogether, there are from three to four hundred different species of mushrooms which are known to be edible and from fifteen to twenty which are poisonous. Then there are many others which as yet have not been tested, leaving an opportunity for any who may desire to make martyrs of themselves.

Before proceeding to indicate some of the characteristic danger signals of the poisonous mushrooms, it may be well to call attention to the various parts of the mushroom plant. The plant body proper consists of numerous thread-like cells which ramify the soil or compost in which the plant is growing. These thread-like cells or hyphae are known collectively as the mycelium and from the mycelium the upright branches arise which we call the toadstool or mushroom. The mushroom is the fruit body or spore-bearing-organ and usually consists of several well

differentiated parts. First a stalk usually spoken of as the stipe and which may be enlarged at the base and sometimes enclosed in a short cup-shaped sac called the volva. Upon the stalk there develops a more or less umbrella-like portion known as the pileus which varies greatly in shape and size depending upon the age and species. On the under surface of the pileus, which is known as the hymenium, are developed the gills or in some species these gills are replaced by teeth or pores. Upon these latter organs the spores are produced. When the mushroom first makes its appearance above ground it is in the form of a more or less rounded head which is spoken of as a button. At this early stage the gills are usually covered over with membranous tissue known as the veil, later



Fig. 2. *Agaricus campestris*, a cultivated variety grown by Mr. A. J. Kline from pure culture spawn. (Original.)

the veil becomes ruptured leaving a more or less distinct ring around the stipe or entirely disappearing.

The following rule concerning the selection of the edible fungi has been given by an expert on the subject: "Avoid eating all mushrooms with white gills, a ring around the stem and a cup or scales at the bulb-like base of the stem, to be in no danger of fatal poisoning. Since the volva, especially when scaly, disappears with maturity and sometimes the ring also, care must be taken to apply this rule to young plants." The collector should also be on guard for the species which contain emetic principles, for while they are not deadly they may cause illness. Finally unless one is an expert on the subject it should be a fast rule to give no advice to others on the edible qualities of any specimen.

The culture of the edible mushroom is becoming more and more a subject of general interest and while there is nothing difficult about the work many fail

from lack of adherence to certain general rules. Five conditions are very essential for the successful cultivation of the edible mushroom, viz.: reliable spawn, properly prepared compost, temperature, humidity and fresh air. For the cultivation of the mushroom the compost must first be prepared. Fresh horse manure is the most suitable material to use for the compost. The manure should be moistened with water until it is uniformly damp and so that water will not run out when squeezed. It should then be thoroughly mixed and put in piles three or four feet deep. In seven or eight days the compost will have become quite hot by fermentation brought about by the action of bacteria. At this stage it should



Fig. 3. Morel fungi (*Morchella esculenta*). The ridged caps are to be regarded as everted cups, whose surface has become ridged and hollowed to afford large area for spore formation.

(After Freeman.)

be spread out, re-moistened and piled up again. This process is usually repeated again at the end of the third week, at which time any straw or coarse litter in the manure will be soft and pliable.

The compost is now ready to be placed in the beds or boxes. If beds are made they should be of such size that one can reach to the center from either side. The moist, but not wet, compost should be placed in the beds and firmly packed down to a depth of ten or twelve inches. A thermometer should be placed in the compost and when the temperature drops to 75° F. the bed is ready to spawn or plant. The temperature best suited for the growth of the spawn is between 55° and 65° F. Ordinarily the cultivation of the mushroom should not be at-

tempted during the hot summer months, owing to the presence of insect pests which are very apt to make the mushrooms wormy and unfit for use.

The spawn consists of dried compact masses of turf or compost, containing mycelial threads of the mushroom. Spawn is a commercial article and a number of different varieties are offered. One form which earlier was much in use is propagated directly from the spores. The spore culture spawn does not seem to yield as uniform and satisfactory results as a product of later introduction known as pure culture spawn. This latter spawn is produced by vegetative reproduction and selection which assures the constancy of the variety or strain. One of



Fig. 4. Shaggy-mane fungus (*Coprinus comatus*). This is an inky-gill fungus. The cap is seen to be blackened at the base, where the whole substance of the cap deliquesces and drops its black spores in an inky mass.—(After Freeman.)

the best pure culture spawns is prepared in St. Paul and known as Lambert Pure Culture Spawn.

The spawn should be broken into pieces from one to one and one-half inches square and these pieces should be placed one or two inches below the surface of the compost, the pieces being about a foot apart. After the spawn is planted the compost should be firmly packed. If the compost and spawn are in the proper condition the plant will begin to run in from a week to ten days and innumerable mycelial threads develop throughout the compost. The bed is now ready for "casing." This consists of placing over the compost a rich loam covering from one to two inches deep. This casing should be firmly packed down, but no watering should be done at this time. An excess of moisture will kill the mycelial

threads as the mushroom requires a large amount of oxygen which it derives from the air and at the same time the plant gives off a large amount of carbon dioxide. This process is just the reverse of that which takes place in the manufacture of food by plants which contain chloroplasts, although in the process of respiration  $\text{CO}_2$  is given off by the higher plants. The failures of beginners are usually due to a lack of fresh air or to too wet compost, either condition resulting in a deficient amount of oxygen for the growth of the fungus.

The humidity should be just about at the point of saturation and should remain so. Damping off sometimes occurs and this is usually due to sudden changes in



Fig. 5. The shaggy-mane fungus (*Coprinus comatus*). This fruiting body is in a more advanced stage of deliquescence than that shown in Fig 4; almost the entire cap has dripped off. A ring (annulus) is seen at the base of the stalk. (After Freeman.)

temperature or too much moisture. The great amount of  $\text{CO}_2$  given off necessitates a good system of ventilation; as the  $\text{CO}_2$  is heavy and will settle to the lower layers of atmosphere it is sometimes possible to arrange so that it will run off through a low door, window or pipe. A vent pipe having some draft will usually remove the excess  $\text{CO}_2$  satisfactorily.

Mushrooms will not grow in wet, unclean places where the air is vitiated. There must be an abundance of fresh air along with other suitable conditions. The plants will grow in the light as well as in the dark, a dark room not being essential but most desirable owing to less danger from insect infection. The best time to collect the mushrooms it is at the time when the veil is about to leave the pileus. Some growers allow them to develop more before collection as the

weight increases very rapidly; the quality however diminishes. After six or eight weeks of collection the soil and compost become exhausted and the beds must be cleaned out, disinfected and rebuilt. In the collection it is preferable to pull up the mushroom by twisting motion rather than to cut it with a knife as this latter process leaves a portion of the stipe which will decay. After collection they should be cleaned and trimmed and if to be marketed packed in boxes or baskets of from one to three pounds capacity. Mushrooms may be safely shipped by parcel post and at present the demand seems to be in excess of the supply.

The food value of mushrooms ranks well with many fruits, although they are not in the class with highly starchy or highly nitrogenous foods. For those who wish to grow mushrooms I would recommend the planting of some of the pure culture strain of *Agaricus campestris*, yielding the common mushroom, or of *Morchella esculenta*, the common Morel, which I believe is being offered in spawn form at the present time. For home consumption the shaggy mane or *Coprinus comatus* is much employed by some. The specimens I have here represent a strain of *Agaricus campestris* that I have grown in my cellar. The study and culture of the plants not only gives me much pleasure and recreation, but I also have a continual supply of this delicious food for the table.

---

## WINDOWS AND WINDOW DRESSING.\*

---

ARTHUR C. SCHULTE, PH. G.

---

It seems strange, if not absurd that anyone in any line of business in the commercialized world of today, need be told the value of window dressing as it is so evident on all hands. It would look indeed strange to the most casual observer if he did not see the windows, principally of the department stores and tailoring establishments, dressed as they are today. If one would stop to think of the enormous amount of money expended in window-dressing week in and week out he would be forced to say, "There's a Reason." The druggist today in business who does not give his windows their proper attention is either indisposed, due to lack of ambition, or else he is merely running his store as a convenient place of address. It's a fact that some druggists will sit on their chairs with their hands in their pockets, smoking a cigar and say, "What's the use?" But if you look around their stores to see the condition of things as well as the stock, you will have little cause to wonder why their business is going back-

wards or why they will always complain of business being "on the bum." Druggists in business today with ideas of twenty years ago have no business being in business. They have lost their place. They are holding back, as it were, opportunities which if allowed to develop would count as dollars and cents on the cash register. The men who say that their customers would not stand for the new ideas in business, and that if they did introduce them they would lose their trade are out of luck, and generally this argument is merely a mask to hide behind the cloak of indifference. The druggists who rely on a patronage of twenty years ago are working under a delusion, for while an established name is an adjunct to any business, still that patronage dating that many years back has passed away, and the new blood that takes its place demands the new order of things.

Here is an idea of the store of twenty years ago doing business today that came to my notice. On the ground floor the windows were made up of many small square panes, several of which had been mended with

\*Read before the St. Louis Branch of the A. Ph. A.