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PEERLESS BRONZE WORKS
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How often have we exclaimed, or heard others say, “Oh, look at those pretty toadstools! Where do they come from and what do they do anyway?” Yet, how often have we failed to obtain a satisfactory answer or give others a clear explanation to this question. The reason being that a knowledge of fungi is not commonplace but is generally possessed by a few specialists, mycologists, who are generally too busy with other affairs to be bothered with what seems to them an explanation of the A, B, C's of their subject. However, an explanation of just what fungi are and “where they come from” should be commonplace, but this explanation is not so elementary as mycologists generally believe.

What Is a Fungus?

A fungus is a plant which has no true root, stem, leaf or flower. Then one might ask, what has it? Instead of roots with tiny cells to gather food and water from the soil, a fungus has microscopic thread-like structures, hyphae, with cells placed end to end represented by the joints of a finger. An unorganized mass of hyphae is called mycelium. Hyphae penetrate rotting plant parts, manure and other organic materials and living plant parts to obtain their food. If hyphae of a fungus take their food from dead plant and animal materials, the fungus is said to be saprophitic, but if they penetrate living plant and animal parts, kill and use them for food, then this fungus is parasitic.

Types of spores and how they are formed on some fungi. (1) Basidiospores on a basidium or club. The spore stage of large brown-patch. (2) Spores of a bread-mold in their case; as many as 70,000 in one case. (3) Spores of an Alternaria which forms leaf spots on potatoes. One of our largest type of spore. (4) A spiny timothy smut spore; germinates in water and forms sporidia or spring spores. (5) Zoosporas, which swim in water like pollywogs, escaping from their “egg case” or sporangium. (6) Spores of fruit mold, on club-like structure supporting many “minnows” or spore bearers. (7) Spores of a powdery mildew on leaf. When end spore is expelled, cell below may form another spore. (8) A winter spore of clover rust forming a germtube with sporidia for spring propagation. (9) An ascus or sack with its 8 spores; note orderly placement. Surrounding fruiting body omitted. (10) Spores of blue fruit mold, formed on tree-like branches of a hypha. (11) Ascospores formed in yeast cell; other cells forming new plants by budding. (12) S1, S2, spores of Pestalozzia which appear like insects. (13) S1, large crescent shaped spore and S2, small spore of snow mold. (14) Spores of downy mildew.
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Graceful lines and extreme flexibility are among the dominant features of the new Toro Junior Tractor.

The new Toro, Junior Model B-30 has a wheel base of 98 inches, and is equipped with a dump box. Exhauttive field tests have proven that the new Toro will climb a 30% grade with a full body load. Note the trim appearance and well balanced lines.

The first completely built small tractor

The new Toro Junior, with its Ford Model A heavy duty motor, has a wide range of pulling power, which enables it to overcome any difficult operating conditions. It can pull five mowers in high gear over any reasonable grade, and three mowers over exceedingly severe grades. When used for utility work, carrying dirt or sand, the Junior will climb a 30% grade, with a full yard body load. The 15-inch rear drive wheels give full protection, and slippage of wheels is reduced to the minimum.

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Only reliable companies are allowed to advertise in GOLF DOM.
So one can see that these hyphae do not make food for themselves but destroy food already made.

But haven't fungi stems? When we mention stems of plants, we think of bark and wood as in a tree or perhaps the hollow stems of grasses with knots or nodes. Fungi have no such structures as these. Even the so-called stem of the mushroom is not wood, does not have joints and pith like corn and grass, but is composed of thousands of small threads or filaments of clear white hyphae lying side-by-side. This material is similar to the unseen feeding hyphae which are located underground. In most fungi, such as cause rusts, smuts, blights and leaf spots, there is no structure that compares in shape and use to a plant stem. In these fungi, the plant consists only of hyphae and spores.

It is easy to see that fungi have no leaves. Leaves of plants manufacture starch and sugar. Yes, we might say most woody material is manufactured in the green which resides in leaves. Without green chlorophyll, in due time, the earth would become destitute of plant and animal life. Even the fungi could not exist, for nothing would remain to manufacture their food for them and they cannot do it for themselves. Some fungi possess colored sap in the cells of their hyphae and color in the walls of hyphae and spores. The brown color of the big brown-patch organism, Rhizoctonia solani, is due to brown cell walls of the hyphae. Yet, some fungi are blue, green and red like the fruit and bread molds, wood staining fungi and the scarlet cup which we find in the spring on rotting twigs. However, no green chlorophyll is found in them, and they cannot manufacture food like leaves.

Let us search among the fungi for fruits or fruiting bodies which contain seeds or spores. Here lies the most fascinating phase in the study of fungi. The fruiting bodies are most fantastically formed, and it is by them and their spores that the fungi are recognized and named, since one can distinguish very few fungi by Common fruiting bodies of fungi. Some highly magnified, others reduced. (1) Pycnidium of a Phoma belching spores volcano-like. (2) Earthstar, Geaster mirabilis, on forest soil. (3) Sporodochium on apple twig. (4) Birds nest fungus on rotting twig. (5) Peritheciun with sack-like asci containing ascospores. (6) Slink-horn, correctly named, growing on sawdust. (7) Coremium or bundle of hyphae each of which bears a spore. (8) Acervulus or knot of hyphae which forms spores. This fungus has two types of fruiting bodies (Nos. 5 and 8). (9) Cup-fungus containing sacks with spores; often very complicated and beautiful. (11) Pear-shaped puffball; this and other puffballs are edible. (12) Woodrot on a stump. (13) Mushroom and two “buttons.”
Hundreds of leading clubs that watch their dollars as closely as their greens, use Semesan and Nu-Green to guard against damaging attacks of both large and small brown patch. Greenkeepers in all districts highly recommend these organic mercury compounds.

In the November National Greenkeeper, J. O. Campbell, greenkeeper at the Wethersfield Country Club, Wethersfield, Conn., said: “I had only one slight attack of brown patch. I used ... Semesan ... This eliminated the disease.” In the same issue Otto Schael of Wausau Country Club, Schofield, Wis., also stated: “We had considerable brown patch but treated it immediately with Nu-Green, which gave favorable results.”

Applied as directed, Semesan and Nu-Green promptly kill brown patch fungi—whenever the disease appears—without turf injury.

For the control of large and small brown patch, 1 pound of Semesan or Nu-Green to 50 gallons of water will treat 1000 square feet of turf by sprinkling. When applied by a power sprayer 50 gallons of the Semesan solution is sufficient for from 2000 to 3000 square feet; 50 gallons of Nu-Green solution for 1500 to 2000 square feet.

SEMESAN gives excellent control under the most severe conditions, but is especially recommended where turf fertility is high.

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NU-GREEN contains same effective ingredient as Semesan. Quickly restores turf to normal condition where fertility is lower.

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<td>300 lbs</td>
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Order from your seedsman or golf supply house. Bayer-Semesan Co., Inc., 105 Hudson St., New York, N.Y.
Is Your Course Fully Equipped With Lewis Golf Ball Washers?

If it is—this part of the advertisement will not interest you—but don't fail to read about the new features for 1930. To give your members adequate cleaning facilities, there should be one Lewis Washer at every tee, and two at the first and tenth—and, of course, one at the practice tee. Now that sand has become almost obsolete, Lewis Washers are just about necessities. No sand is used in a Lewis Washer—just pure soap and water.

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Colors are always interesting and add
to the beauty of objects in nature. Some
spores are white as snow, while others
are as black as ink; while some are va-
rious tints and shades of the rainbow.
However, some spores which appear
nearly white when viewed through the
microscope are decidedly colored when in
a mass. The spores of fruit and bread
molds illustrate this fact; in mass some
are green, some blue and others salmon
colored, but when viewed through the
microscope all appear hyaline or white.
Our common mushrooms are classified ac-
cording to their spore colors; white, black,
brown, rusty, lemon, rosy, red, purple,
violet. Masses of these spores often give
to a fungus its color by which it may
be distinguished.

Spore Germination
When spores germinate they generally
send forth a hypha; however, some spores
send out free swimming cells, zoospores,
appearing like minute pollywogs which
sooner or later form hyphae. One fungus
may have as many as five different spore
forms. The stem rust of wheat and
grasses may have two spore forms on

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the English barberry, two on grass plants, and one develops from a winter spore. This gives this fungus a very complicated life history with two plants as its hosts.

Spores have never been found connected with the life history of some fungi as Sclerotium rhizodes, which causes the silver tip of our grasses. Furthermore, for a long time the large brown patch fungus, Rhizoctonia solani Kühn., was thought to be sterile but soon after 1903, French and American mycologists accepted the fact that spores are sometimes formed on club-shaped structures, basidia, and then they renamed the fungus, Corticium vagum B. & C. The fungus that often causes snow mold, Fusarium sp., has at least three spore forms in Massachusetts; globose and prickly, large crescent shaped and small, nearly globose spores. Thus the spores of fungi are "fearfully and wonderfully made."

A gentleman caller asked the other day, "Aren't there more of these fungi than there used to be?" Apparently, there are, but in reality, no; for we are more alert to their presence and more familiar with their ways than formerly. Also, an elephant is easier detected in the jungle.

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than a mouse. The small and the microscopic forms of life are the ones generally neglected by man when dealing with nature. Most of the fungi are small, like the mouse; however, the mushrooms and some of the wood destroying fungi are sufficiently large, like the elephant, for man to observe, and these were the forms recorded by man in literature. Previous to the Revolutionary war, only a few hundred species of fungi had been specifically named, but now one writer has estimated the number as 100,000, while another places the species and forms as 200,000. The flowering plants number about 135,000, but most mycologists believe that there are generally more species of fungi than flowering plants in a community.

Geographically, fungi are found “in the utmost recesses of the earth.” Spores and yeast plants have been collected in an aeroplane several thousand feet above the earth’s surface. Ross Marvin told the writer that he collected fungi and yeasts in the polar regions while accompanying Peary. From the polar regions fungi are distributed over the earth’s surface even to the deserts in the tropics. Some of the substrata or materials on which fungi grow might be mentioned: water, fish, frogs and insects, feces of animals, hoofs, horns, feathers, flesh such as eyes, ears, nose, lungs, liver, intestines and skin; in milk, fruits, nuts, vegetables, silage, fodders, cereals, grasses, potatoes and soil; wood in houses, barns, posts, poles, wood-pulp, cordwood, and various other materials and plant parts too numerous to mention. In general, we might say that fungi are omnipresent.

Fungi are useful as well as harmful to man. Mushrooms are used for food; corn smut is fried and eaten by some tribes of Indians; a blue mold, Pencillium roqueforti, is used in manufacturing roquefort cheese and can be seen in the cheese, while other blue molds are used to ferment garbage and manufacture acids. In Russia, Japan and other countries fungi are used to ferment certain beverages; yeast is a fungus extensively used in the baking and brewing industries and it is prepared in various ways as a food for its vitamin content. Furthermore, fungi have been used to parasitize and exterminate various species of undesirable insects; fungi changes the old fallen wood in the forests and plant parts into plant foods.

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