SCIENCE AND NEAR-SCIENCE UP-TO-DATE

How to Tell EDIBLE Mushrooms From the POISONOUS

THE one obstacle in the way of making general use of the mushroom as a food—and it is a nutritious food that may be obtained at low cost—is the fear of mistaking the poisonous varieties through their similarity in appearance.

What are the distinguishing features by which one may decide between the edible and injurious varieties?

In the first place, if you are planning to grow mushrooms, the simplest and easiest way of deciding which varieties to select is to send your samples to the Department of Agriculture at Washington, where they will be passed upon by experts and all the information you may require sent to you without cost.

But this means of deciding between varieties obviously involves too great a delay for those who intend picking mushrooms for their next meal. For these there are numerous tests that may be made immediately.

An important item to remember is that the common edible mushroom has pink gills when young and purplish-brown or black gills when mature. All species with yellow or white gills should be avoided by the novice. Some of these varieties are edible, but they should be passed upon by an expert before they are used as food.

The common mushroom of commerce usually is found in the open and grassy glades, never in the forests. Therefore, one should be exceedingly chary about picking mushrooms in shady spots or in the woods unless they have an expert knowledge of the varieties they are seeking. When conditions are favorable the edible mushroom may be picked in midsummer in old pastures and on lawns. They are more often found, however, in the autumn.

The variety about which there is no question as to food value grows about three inches tall, has a fleshy cap about three inches broad. This cap generally is white, but sometimes reddish or brownish above and pink beneath.

Remember that its stem does NOT rise from a cuplike base. Also, it is best gathered in the "button" stages—that is, before the cap has expanded.

Most of the poisonous species have a fleshy cap that is whitish, moist and clammy to the touch. Their stems are usually ringless or nearly so. When they have gills they are a pale pink white. An offensive odor even more than their clammy feeling mark them as being harmful.

The surest test is to nibble at them without swallowing any. The poisonous varieties have a peculiar and disagreeable taste that is immediately evident. It is easily recognized after tasting it once.

There are a few species that are sometimes edible and sometimes not, but these should be left alone for safety. This is true of the variety known as "amanitas." They have tall stems surmounted by a cap whose surface ranges from a glassy white to a gray, orange and brown. The gills are white and the stem the same color. They grow in the woods and their beauty often makes them a snare to the novice.

At any rate, it must be remembered that for a novice to experiment freely with mushrooms is about as safe an occupation as the handling of gunpowder.

Mushrooms furnish a highly nutritious food at little cost, but they must be selected only with the greatest care. It has been said that they are as rich in food value as meat. This, however, is not proved by an analysis, which shows they contain no considerable amount of fat.

Mushrooms should be gathered when young and be eaten fresh. They should never be served when they begin to decay. They should be cleaned thoroughly and kept in slightly salted water before using.

The three pictures to the left show the edible variety of mushroom in three stages. The small drawing is a section of the infant mushroom, the next a mature example and the third a section of the fully developed mushroom. Externally it is pale brown, dry, often silky, never viscid. The cuticle peels readily away, as shown, and the gills underneath grow from white to pink or rose-colored and then brown-black. They are usually more or less free from the stem, which is slightly pithy up to the middle, but never hollow, and has a fluccose ring near the middle. The poisonous mushroom shown in the two views at the right has pale, clay-colored gills, an offensive odor and a clammy or viscid top.

How Explosives Are Selected for War

THE history of the modern explosives used in the great war dates back to 1888, when smokeless powders for service work became a possibility. Up to that time gunpowder had been the explosive used both as a charge for the gun and as a bursting charge for shells, and although, as a result of thirty years' work, the forms of gunpowder used had been so beautifully fitted to the work that had to be done as to render the powder charge a "propellant" the result of the firing of which could be absolutely predicted, the fact that more than one-half the weight of the powder was driven from the gun in the form of smoke became an insuperable objection.

In 1886 the largest guns we had weighed 110 tons, fired a charge of 960 pounds of prism powder, threw a shell weighing 1,700 pounds, and were 16.25 inches in diameter, being, therefore, larger than the 16-inch guns the Germans are supposed to possess, while our own largest guns are now the 15-inch on the new superdreadnoughts throwing a 2,000-pound shell with 50 per cent greater muzzle velocity than the old 16.25-inch gun using powder. The secret of this increase in efficiency is that the charge of the old 110-ton gun had not only to drive out the projectile but also some 500 pounds of smoke, while less than 50 per cent of the charge was effective.

The introduction of rapid-fire machine guns made the smoke trouble still more serious and rendered a smokeless powder a necessity.

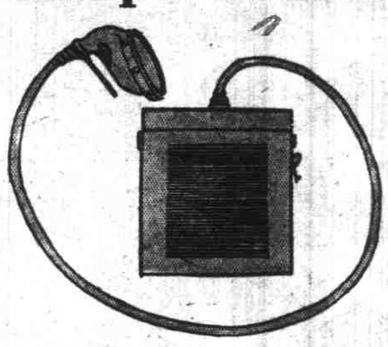
In any successful explosive certain conditions have to be fulfilled. One must be able to concentrate in a small space bodies which will act upon each other independent of the air with enormous rapidity, forming the largest possible volumes of gas, which, having to find way for itself, gives the explosive effect. If this change takes an appreciable time the body can be used as a "propellant" in a gun, and gunpowder is of this character. When, however, the change takes place practically instantaneously it cannot be used in a gun and is used in high-explosive shells, bombs, torpedoes and mines, and such bodies we call "high explosives," guncotton and nitroglycerin being examples of this class. When, during the formation of the gas from the solid in explosion, other solid compounds are formed as well, the solids are blown out in fine particles and form a cloud, smoke. But if only gases are produced the explosion is smokeless. Gunpowder on being fired gives more than half its weight as solids, and therefore forms clouds of smoke. Guncotton is resolved entirely into gases and gives no smoke.

New Electric Lamp to Save Miners' Lives

MINERS at last have been equipped with a practical electric lamp—a lamp that probably will do more to prevent mine disasters than any life-saving device brought forth by modern progress.

Mine fires in the past have been the cause of untold and inestimable loss of natural resources, yet despite the efforts of inventors and engineers nothing more satisfactory in the nature of a portable lamp for miners was brought forth than a developed and improved "Davy" lamp, in which the flame above the underground worker's forehead is protected by wire gauze, which conducts away the heat before it can penetrate to the more or less inflammable gases which may be present in the atmosphere of the mine. It is a simple apparatus and dependable within limits, but in this day of mechanical perfection it is crude, an archaic relic.

The new Edison mine lamp battery is contained in a small nickel-steel can of convenient size and weight, to be strapped at the back of the belt. It is tightly covered, and from it a flexible tube carrying the insulated wire is brought up over the back of the head to the incandescent lamp fastened to the front of the miner's cap. It is a "fool-proof" apparatus, which requires no attention whatever from the miner, and which he cannot damage without actually breaking it open, for the outfit, properly charged, and with the current turned on, is handed to him at the mouth of the mine, with the cover locked. It will continue to produce light until the battery is surrendered when he emerges from the workings, or until the battery is exhausted.



How the Battery and Lamp Look.

Those in charge of the batteries have nothing to do but unlock the covers, hook them up to the power source and recharge for the next day's work. The materials in the battery are permanent, the roughest jarring produces no ill effects, and the battery does not have to be fully exhausted before it is recharged. Even such mistakes as the reversal of the charge does not permanently injure the battery, and it may be left for indefinite periods charged, uncharged or semi-charged without appreciable loss. Specific gravity readings of the electrolyte are unnecessary, and the only care required, other than that of recharging, is the replenishing of the electrolyte about once every ten months and the occasional addition of distilled water to replace that lost by evaporation. Other parts of the battery are unchanged by its operation. The plates never have to be renewed.

Why You Use a Tooth Brush

A GOOD tooth brush if used conscientiously should not be in use more than two weeks at a time, and it is better to keep two in use so that each may have a period of drying out and airing. It never pays to buy too cheap a brush if the price is at *the expense of the bristles. In the first* place a poor set of bristles will not do their work well and in the second place loosely fastened bristles are very dangerous if they slip down the throat where they may catch and decay or penetrate the walls of the digestive tract. Always wash out the brush thoroughly after each application; and, by the way, a new brush should be soaked in a weak solution of bicarbonate of soda for two hours both to disinfect it from shop handling and to set the bristles so that they will not fall out so readily.

The teeth should be brushed at night, after each meal, and upon rising. It is particularly important to clean them the last thing before retiring so that food particles will not remain over night when the mouth saliva is not active enough to prevent it.

During a long illness the teeth should *be carefully cleaned when they cannot re*ceive attention from a dentist. If this were done fewer teeth troubles would be laid to the ailment, which is not much more to blame than neglect of the mouth. See that the mouth is constantly washed out with *a little bicarbonate of soda, which can be* prepared by dissolving a teaspoonful of the bicarbonate (ordinary baking soda) in a pint of water and bottling it for use. Most authorities consider this better than too frequent use of the hydrogen peroxide solutions, which are not always good for the teeth.

Frightful Inventions to Take Life

THE war of the future will be the war of the inventor, even more than it is today. Science, mechanics and electricity have, as we all know, revolutionized modern warfare to a terrible degree. Talk to men who remember the Crimean war and they will tell you that the present conflict is not war; it is wholesale murder, fearful, horrible and inhuman. The wars of the future, however, if the scientist is to be believed, will be even more destructive.

At present he is experimenting with heat rays. If, he contends, light rays can be thrown upon a hostile position with the searchlights, why cannot heat rays be similarly reflected; and if heat rays can be sent to a distance, why not the hottest rays possible—namely, those of the oxy-acetylene torch? Before such a fiery glare fortresses of steel and stone would melt, the biggest guns would crumble down into pools of steel, and whole regiments of men might, with one blast, be shriveled into ashes.

Neither do scientists consider it outside the bounds of possibility in the future to devise means of detonating explosives at a distance by wireless waves. The latter at present scatter in every direction, but the day may come when it will be practicable to restrict them to only one direction, so that they may be aimed; and it is not too far-fetched to predict that some future general, touching a button, will send speeding to their target, which will be, perhaps, an entire army division, wireless impulses so powerful that they will electrocute every man within their range.

In regard to big guns, experts say that the limit is by no mean reached with the manufacture of seventeen-inch firing monsters. They prophesy sixty-inch and even eighty-inch guns, which will be able to shoot sixty or eighty miles, the range being given by aviators signaling by wireless.

Again, plans are already under way for the construction of monster submarines, with a cruising radius from London to New York. They will be able to carry batteries of torpedoes and ample fuel and provisions for the long cruise. They will thus gain some of the independence of land possessed by dreadnoughts, for even they must visit coaling stations or be attended by colliers. The next half-century, indeed, may see battleships swept from the seas, and some nation holding the mastery of the ocean by virtue of a fleet of submarines.

Maple Syrup From Bark

ON THE theory that the flavor of the sugar maple is contained in the rough outside bark as well as the sap of the tree, a West Virginian has patented a process for making maple sirup that contains an extract from the bark.

New Use for Fireless Cooker

IF A peddler calls at your door in the near future and offers to sell you soups, meats or vegetables, piping hot and ready to serve, do not be surprised.

For the business of bringing your dinner to you is a new and rapidly growing industry. If it continues as it is expected to do you soon will not be compelled to consider your dinner at all—you may select it from the traveling cafe that will call at your house daily, or as often as you desire.

A recent improvement in the fireless cooker has made this work possible. They now are being used in conjunction with a *co-operative kitchen plan in a New Jersey* city. The new cooker is composed of numerous compartments in which several articles of food may be cooked at the same time.

When the meal is ready it is carried—still in the original compartment in which it was cooked—to the home of the purchaser. In some cases the contents of one cooker are divided between two or more families, thus cutting down the cost of the home meals materially.

Many plans are being worked out through which the plan may be used to fight the high cost of living. The most practical of these is the one suggested by a woman who has had her main meal delivered to her daily by means of the cooker. She suggests purchasing a number of the cookers, taking orders each day from a number of families, preparing the food ordered and delivering it at a stated time.

"By this means I can deliver just the kind and variety of food required at a cost far below the cost of preparing it in each home," said the woman, who hopes to make a business of "home cooking."

New Facts You May Not Know

SANDSTONE can absorb a gallon or more of water to the cubic foot of rock.

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WITH 3,000 telephones one New York office building holds the world's record.

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PARAFFIN paper tubes have been invented to aid the users of bubbling drinking fountains.

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ABOUT 900 colors are known to dyers, of which only about 100 are made in the United States.

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TO CONVERT an ax into a pick is the purpose of an attachment patented by a West Virginia inventor.

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MICHIGAN is the leading state in the manufacture of sand lime brick, followed by Minnesota and New York.

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WHAT is believed to be the largest conveyor belt in the world, 893 feet long by 36 inches wide, has been made for an Ohio stone quarry.

ARGENTINA was given a population of 7,704,396 by a recent official estimate.

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AN ELECTRIC oven in a Toronto bakery turns out nearly 3,000 loaves of bread a day.

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A PHOTOGRAPHIC process for printing textiles or wall paper has been invented in England.

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A FACTORY in which radium is being produced has been opened in Scotland by a Scotch chemist.

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ONE of the best grades of Italian cheese is sold only after it has been seasoned for at least four years.

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AN ENGLISHMAN has invented a machine which is said to perform the work done by a hand-polisher on furniture.

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A FRENCH scientist has invented apparatus to determine the percentage of carbon in steel by burning it in pure oxygen under pressure.

How Wounded Horses Are Nursed

WHEREVER it is possible wounded horses in the European war are given almost as careful attention as are the soldiers. The army council of Great Britain is reported to work out its plans for attending injured horses with just as great pains as it does wounded troopers.

To every division and cavalry brigade is attached a mobile veterinary section. Each consists of one officer and twenty-two trained men of the army veterinary corps, all mounted and fully equipped with all the necessary veterinary means. Their function is to relieve the field units of sick and inefficient animals. They are the connecting link between the field units and veterinary hospitals. The patients they obtain, after proper first aid treatment, are conveyed to the nearest railway and dispatched by train to the advanced veterinary hospital, the mobile veterinary section finding the party required to attend to the patient's *wants during the railway journey.*

Then comes the veterinary hospitals, ten in number, and situated at different points along the line of communication. Each is organized to deal with 100 cases, and has a staff of officers and trained men of the *army veterinary corps. All necessary vet*erinary medicines, instruments and surgical means for dealing with the patients are provided. The cases are received into the advance hospital, and from there, after treatment, drafted, according to their severity, to the hospitals further down the line. The cases which end in complete recovery are discharged to the remount department for reissue to the fighting troops, but many horses discharged from the hospital are found to require further rest before they are fit for reissue. These are drafted to *the convalescent horse depot.*

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The horses are treated with just the same care and skill as are shown to wounded soldiers. They are given chloroform and other anaesthetics before they are operated upon by skilled officers. The allies' convalescent horse depot has been established in one of the healthiest places in France, and it covers an area of twenty miles. Here the patients run to grass in small, well-sheltered paddocks, receiving extra feed, and they are under the supervision of officers of the army veterinary corps. By this means a very large number of animals which would otherwise be lost to the state are saved and again become thoroughly efficient troop horses.

At the conclusion of the Chino-Japanese war a monument was consecrated with much ceremony in Tokio to the memory of the horses lost in the war. The monument cost $40,000.

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At the conclusion of the Russo-Japanese war the Japanese held a funeral service in Miyagi for the horses killed in the war with Russia.

When the Germans bombarded Louvain the first time bleeding, riderless horses galloped into the town in the front of the Belgian advance guard which had been in action.

The Lys victory in mid-October was due to a French horse. Two thousand French cuirassiers made a long detour and came to a point where they decided to cross, although the stream was deep and the current rapid. A courageous horseman swam *the river with a rope about his shoulders,* and when he reached the other side tied the rope to a tree. The rest of the men made their way over by holding to the rope. They got across without alarming the enemy.

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Then they charged. It was a surprise. The enemy gave way. Then the infantry quick-marched to the river front, crossed on speedily erected pontoon bridges and pressed the advantage so that the Germans withdrew from Lys.

J. Stulton, English lance corporal, tells *this story:*

"One man of the —th Lancers I found lying on his back with his eyes staring at the skies. He was dead without doubt. Standing over him was his horse, without a wound. It was looking into his face every *few minutes, and then neighing in a pitiful* way that sounded just like a human being in an excess of grief. To hear that poor animal was enough to bring tears to the eyes of the most hardened of men."

Do You Dine With Your Plants?

DO YOU ever think of inviting your plants to dinner?

An expert in plant life who took a large number of sundew plants and supplied half of them with nitrogenous food in the form of roast beef arrived at the following facts:

Of the plants that he fed, 69 per cent more survived than of the same number that were not fed in this way; their stems weighed 41 per cent more, they excelled the starved plants in the number of their seeds by 141 per cent, and in the aggregate weight of their seeds by 279 per cent.

Other scientists who have fed these plants with aphides of similar small insects have secured like results.