BOTANY

NATURE RAMBLINGS

by Frank Thone

Mushroom Growth

➤ MUSHROOMS, puffballs and other fleshy fungi multiply before our eyes as spring warms up and showers become more numerous. We never quite get over the feeling our great-grandsires had, that there was something elfin, preternatural if not actually supernatural, about the sudden appearance of these strange growths. Yestereven they were not here; this morning they are all over the lawn like the tents of a fairy army; whence came they so suddenly, if the Little People didn't bring them?

Alas for our fancies, mushrooms and their kin do not grow as quickly as their sudden appearance might lead us to believe. Their real growth is, if anything, slower than that of most other kinds of plants, and always remains hidden.

You can get an idea of this hidden growth by carefully running your fingers into the loose mold of the forest floor where mushrooms are growing and lifting some of it gently, along with a mushroom or two. From the base of the stalk you will find white cottony strands running out, rapidly branching and re-branching like roots, only not nearly as strong as even the weakest roots. The ultimate branchlets are glistening white threads, which may even be so fine that a microscope is needed to detect them.

These threads are the real body of the mushroom; the conspicuous, curiously-shaped overground body is only a structure that produces the reproductive cells, the spores, and sows them on the wind for distribution. The underground threads are what feed on dead leaves and wood, on anything dead in the soil, and in some species even parasitically on other plants that are still living. These threads are known to botanists as hyphae; a mass of such hyphae is called a mycelium.

The mycelium grows and spreads sometimes for several years, with no sign above ground. Then, when conditions become right for reproduction, the "buttons" that will eventually become the fully expanded mushrooms begin to form, just beneath the surface. They are like embryos, with all adult parts represented, but in small size and tightly packed. Finally, warmth and wetness induce them to take in water at a terrific rate. They expand accordingly, and thus pop up overnight. But the silent, unseen preparations for this dramatic event have always been a matter of long, slow preparation.

Science News Letter, April 24, 1948

Science Service Radio

➤ LISTEN in to a discussion on "The Future of the Nation's Health" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EDST Saturday, May 1. Mr. Oscar R. Ewing, Federal Security Administrator, will be the guest of Mr. Watson Davis, Director of Science Service. Mr. Ewing will discuss the purpose of the National Health Assembly, due to open the day of the broadcast.

Science News Letter, April 24, 1948

AERONAUTICS

Jet Planes Need Cooling

Some means of refrigeration is required to cool the pilot-cabins in fast jet-propelled airplanes, engineers are told.

➤ PILOT-CABIN cooling is necessary with jet-propelled aircraft capable of flight speeds of 500 miles an hour or over, the Society of Automotive Engineers was told by D. O. Moeller and O. Andrew Sanne of Stratos Corporation. Flight at speeds over the 600 miles-per-hour mark under extreme temperature conditions requires some means of refrigeration, they said, to make the cabin endurable for the crew members.

The heat comes from the outside of the plane—even when traveling high above the earth where the atmospheric temperatures may be well below zero Fahrenheit. It forms in the so-called boundary layer of air next to the plane which passes over the craft at a lower velocity than the outer air. It is due to the conversion of the kinetic energy of the air stream into heat. Part of this heat is dissipated to the air stream, they explained, but part passes to the cabin walls and raises the inside temperature.

In addition to this heat, there is also a heat input from electrical equipment, crew members, and solar radiation. It is not surprising, therefore, they stated, that even at high altitudes operation of the cooling system is necessary.

In a jet-propelled plane equipped with an expansion-turbine type cabin cooling system, air taken from the jet-engine compressor is the source of cabin ventilation. Two systems of cooling the air are used, one a simple system, the other the so-called bootstrap method. In the simple system the air is cooled by passing through a heat-exchanger, which uses ram air as the cooling medium, then is cooled further by expansion through the turbine.

The bootstrap system utilizes two heat exchangers combined with a centrifugal compressor and an expansion turbine, they stated. The air taken from the engine is passed through the first heat exchanger and then is compressed in the centrifugal to an appreciably higher pressure. The air is cooled in the second heat exchanger and then is finally cooled by expansion in the turbine.