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Office hour Tuesday 11-12pm.

Raven et al. All Fungi: 260-295 . Intro to fungi: 260-266. More general fungal material: 282-295.

What is a Fungus?

Parts of a fungus: mushroom, hyphae and spores.

Hyphal growth and feeding

Mycelium and hyphal fusions

Fungal cell walls, Chitin, glucans and proteins

Fungal plasma membrane, ergosterol

Spores, their number

Morphology: Hyphae v. yeasts v. chytrids

Place of Fungi in the Tree of Life (Fungi as replicators).

Organisms studied by mycologists v. the Monophyletic Kingdom Fungi

Appearance of the most recent common ancestor of Fungi and Animals.

Independent origin of multicellularity in fungi, animals and plants

Phylogenetic trees and geologic time

What is inside the Kingdom Fungi?

How Fungi earn a living (Fungi as interactors).

Recyclers or Saprobies (saprobic + microbes).

Microbes recycle most biomass.

Fungi v. bacteria: cold tolerant and invasive in wood.

Good rot v. bad rot and the preservation of food by rot.

Symbionts - Parasites.

Every plant and animal has its fungal parasites (undercounting of Fungi).

Plants: coevolution v. exotic pests and agricultural monocultures.

Animals: obligate, facultative, systemic and opportunistic.

Symbionts - Mutualists.

Lichens: cyanobacteria or green algae plus an Ascomycota or Basidiomycota.

Mycorrhizae: arbuscular and ectomycorrhizae, an old and widespread association.

Was the World Made for Man? Mark Twain, 1903

"Alfred Russell Wallace's revival of the theory that this earth is at the center of the stellar universe, and is the only habitable globe, has aroused great interest in the world." -- Literary Digest

"For ourselves we do thoroughly believe that man, as he lives just here on this tiny earth, is in essence and possibilities the most sublime existence in all the range of non-divine being -- the chief love and delight of God." -- Chicago "Interior" (Presb.)

I seem to be the only scientist and theologian still remaining to be heard from on this important matter of whether the world was made for man or not. I feel that it is time for me to speak . . .

It takes a long time to prepare a world for man, such a thing is not done in a day. Some of the great scientists, carefully deciphering the evidences furnished by geology, have arrived at the conviction that our world is prodigiously old, and they may be right, but Lord Kelvin is not of their opinion. He takes a cautious, conservative view, in order to be on the safe side, and feels sure it is not so old as they think. As Lord Kelvin is the highest authority in science now living, I think we must yield to him and accept his view. He does not concede that the world is more than a hundred million years old. He believes it is that old, but not older. Lyell believed that our race was introduced into the world 31,000 years ago, Herbert Spencer makes it 32,000. Lord Kelvin agrees with Spencer.

Very well. According to Kelvin's figures it took 99,968,000 years to prepare the world for man, impatient as the Creator doubtless was to see him and admire him. But a large enterprise like this has to be conducted warily, painstakingly, logically. It was foreseen that man would have to have the oyster. Therefore the first preparation was made for the oyster. Very well, you cannot make an oyster out of whole cloth, you must make the oyster's ancestor first. This is not done in a day. You must make a vast variety of invertebrates, to start with -- belemnites, trilobites, jebusites, amalekites, and that sort of fry, and put them to soak in a primary sea, and wait and see what will happen. Some will be a disappointments - the belemnites, the ammonites and such; they will be failures, they will die out and become extinct, in the course of the 19,000,000 years covered by the experiment, but all is not lost, for the amalekites will fetch the home-stake; they will develop gradually into encrinites, and stalactites, and blatherskites, and one thing and another as the mighty ages creep on and the Archaean and the Cambrian Periods pile their lofty crags in the primordial seas, and at last the first grand stage in the preparation of the world for man stands completed, the Oyster is done. An oyster has hardly any more reasoning power than a scientist has; and so it is reasonably certain that this one jumped to the conclusion that the nineteen-million years was a preparation for him; but that would be just like an oyster, which is the most conceited animal there is, except man . . .