

A FUNGUS GROWING IN "MINERAL OIL."

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On November 28, 1925, a middle-aged patient, an intelligent, trustworthy man, was given a "Pinoleum" outfit for spraying the nares, morning and evening; at the same time he received a considerable supply of plain Oil of Petrol, known also as "Mineral Oil"—not an oil at all but a paraffine; the repeated replenishing soon diluted the original green tintured and aromatized "oil" to the vanishing point.

On April 18, 1926, that is nearly five months later, the patient called attention to the presence of a white flocculent mass suspended in the oil, near to and at times touching the bottom of the glass container; it resembled a tuft of fine cotton, about the size of a large coffee bean. He was going to throw it out—feared it might clog the tube. "Ah, wait a moment," I exclaimed, "let me examine it." A flocculent white mass. "Did any cotton get in?" "No." A closer examination with a hand lens revealed filaments extending in all directions. "And you say it has grown, developed in the oil?" "Yes." That upset my ideas in regard to metabolism, the relative role of water, food and air. First thoughts were along the line of the perverted metabolism of the hot water or geyser alga of the Yellowstone Park, but a microscopical examination revealed spores. Ah, a fungus,—an opinion confirmed by several botanists to whom some of the material had been given; apparently an *Aspergillus*, without venturing an opinion as to the species. One man expressed the idea that it might be a new species on account of this peculiar and unique habitat.

A bibliographic research in the rather limited literature at my command proved negative, likewise personal inquiries among men who might have had experience; one biologist bluntly expressed his belief that life under such conditions was impossible. Yet here is the specimen!

The following statements from a paper on "Function and Design," by Prof. J. B. Leathes, before the British Association for the Advancement of Science, (*Science*, October 22, 1926, p. 387) may be of interest in this connection:

"Life is exhibited only in aqueous systems, containing unstable, perishable combinations of carbon with hydrogen, nitrogen, sulphur, phosphorus and oxygen, in the presence of certain inorganic ions, those which are present in the sea, the native environment originally of all forms of life . . . the molecules that enter into the composition of living matter exhibit the phenomena of life only when permeated with water molecules exercising the kinetic activity of the liquid state."

Theoretically considered, water is necessary. Nutrients are necessary, although a small speck of dust, passed in while using the atomizer,

would suffice for a small colony (the mass appeared as one large single colony), yet such a dust particle would at once be permeated or saturated with the "oil" and rendered insoluble in water—and on the assumption that water is necessary to carry on metabolism, this "oil" would have to be leached out, so to speak, before the food or nutrient would become available. "Mineral oil" is a wholly artificial product due to man's activity, unknown until only a few years ago. But after all the process of adaptation to such a medium may be simple.

Through correspondence a microbiologist was finally found who was both competent and willing to undertake an investigation.

I have before me a letter from Dr. Charles Thom of the Microbiological Laboratory of the Bureau of Chemistry, U. S. Department of Agriculture, from which I quote:

"My interpretation of your observation follows: Oil in a substratum may be regarded as an inert substance so far as the microorganisms of this group are concerned. When colonies of fungus develop in a grease or oil, it is practically always attributable to the entrapment of little globules of watery substance in a body primarily consisting of oil. We have known, for example, colonies of mold to develop in barrels and pails of grease. In those cases extremely careful analysis shows that little globules of water have been entrapped in the grease, carrying with them sufficient nutrients to produce small colonies of mold.

"Your observation is sufficiently interesting so that we will be glad to take note of the sample and make a careful examination and cultures from it and let you know whatever we find."

Summary and Observations. The original "oil" in the atomizer was tintured a light green and aromatized with essential oils.

The original "oil" in time reached the vanishing point through repeated additions of plain "Oil of Petrol."

The atomizer was used twice a day, morning and evening, at home, under ordinary room conditions, in a closet and not exposed to direct sunlight. While in use there was considerable pressure on the oil and agitation through handling,—conditions very different from usual culture conditions.

The white, delicate filamentous or mycelial mass was suspended in the "oil" near the bottom but movable.

Dust particles might naturally be expected to enter through the air forced in while using the atomizer. Some water or moisture might also gain entrance, but the oil itself was clear, no globules visible.

The term "oil" should be fully considered. Mineral oil is a distillate, a paraffine, a substance wholly foreign to living matter. When it permeates a dust or food particles is a living organism able to leach it out?

In time the white mass turned dark and shriveled. Spores are abundant.

Finally, I have placed some of the original material in small vials. If any of you care to work on this material, you are welcome to it.