ile, are due to the results of parasitic vasion—some by their mechanical resence, come by the ferments promed in the body, and in plants by hanges in or taking from them their le juices, causing starvation and mmature growth.

In any given case of rotten brood, iead from, freezing, starvation, or ther causes, being allowed to remain the cells, much of the poison renerated, as well as the germs themelves, or their spores. remain adherent to the sides of the cell. These are like the seeds which "fell n stony ground," and will not grow intil the proper soil, such as is unished by rich nitrogenous substances supplied to the brood by the nurse bees is brought in contact with hem, when a luxuriant growth This produces a fermenting, obtains. e decomposing food unfit for the brood, and sets up a ferment, a decomposition within the bodies of the bees, thus destroying their lives. This might appen to the host with any form of parasitic life, either animal or e wegetable.

It might be said, speculatively, that the disease had its origin in tarvation, and that in some cases ^a vereral putrefactive bacteria of similar ^b viological character were responsible tarted and undisturbed, becomes as the started and undisturbed, becomes as the structive as the old-fashioned foul at mood. The two germs. *Becilling willing and †Becilling hilii and †Bacillus thoracis, isolated by fullin and †Bacillus thoracis, isolated de laving similar, or the same, biological t-t tharacteristics, especially an alkaline is medium in common, are both in a by measure responsible for this disease, e and perhaps the variations, the se talignancy, etc., are due to modifi-is ations by their combined action. It

is. evidently, not due to a specific germ, Bacillus milii, the other, perhaps purely accidential at first, on account of its requiring more oxygen, is now found in the thorax among the respiratory organs.

While it has not been clearly demonstrated by facts, practically, it appears to be true that perfect bees, especially nurse-bees, are injured by the infection.

Differential Diagnosis-Foul brood, pickled brood and black brood. Foul brood, due to Bacillus alvei—a specific bacterium.

Pickled brood, due to Aspergillus pollinis-a specific fungus.

Black brood, due to Bacillus milii. modified, perhaps, by Bacillus thoracis, specific bacteria.

Black brood may be introduced into a healthy colony through infected food or infected combs-combs from which the diseased brood has been removed, or in which particles remain. The food for the young larvæ, either from its chemical reaction or from its lack of nitrogenous substances, is not a suitable medium for immediate growth of the germs; but when the chyle-like food is furnished the older larvæ, a chemical change in the food produces a change in the liquids of the bee, which becomes a suitable nutrient medium for their rapid development and dissemination. It would appear that, in some cases, Bacillus thoracis was the cause of death, as the spiracles, or openings admitting air to the respiratory apparatus, were closed by the products of decomposition or the result of In such cases it is usually nearly it. matured bees that are choked for want of air. These did not show the discoloration or shapeless mass which always obtains when Bacillus milii is found in the abdomen. This latter germ, multiplying rapidly in the rich nutrient medium of the alimentary

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^{Thacillus milii, n. s. So named from its resem-ace to millet seed. Accillus thoracis, n. s. Found in the thorax, and the air-passages, spiracles etc.}

the air-passages, spiracles, etc.