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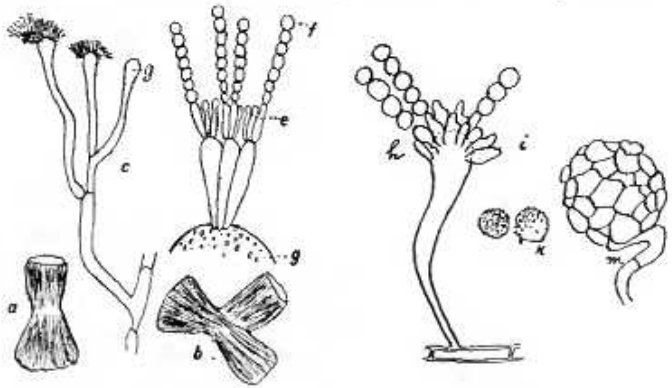
Moulds in Medicinal Solutions.

STERIGMATOCYSTIS OCHRACEUS.—This form of mould (figures a, b, c, d, e, f, g) differs from Aspergillus slightly. In the latter, the spores are borne on simple flask-shaped bodies, the sterigmata (fig. h) while in the former these sterigmata are compound and branched (d, e). This mould was found in a fruiting condition, but upon artifi-



cial cultivation it developed large, ocher-colored heads of spores. These heads were 80 to 200 microns in diameter, and irregular; the spores were small, spherical, 3 microns in diameter and minutely roughened. This form fluidifies gelatin and changes the color of the medium, but what effect it has upon sugars or the active plant constituents is unknown.

In the cut, a and b are spore heads showing irregular

forms; c is a schematic representation of a fertile branch; d is a primary sterigmata; e is a secondary one; f is a spore and g are columella.

ASPERGILLUS REPENS.—This mould grows much like the Penicillium and Mucor shown in "The Microscope" for September last. The mycelium is like that of Penicillium. The spore head is quite different (h). Primarily the fertile branch of Aspergillus is single-celled, non-septate, while those of Penicillium are septate. The apex of the fertile branch is swollen, club-like, from which swollen end called columella (12 to 36 microns in diameter) the spores, k, are borne from single, flask-shaped bodies marked d in the cut and called sterigmas. The spores are 6 to 8 microns, slightly roughened, at first yellowish, later greenish to gray. In later cultures small yellowish bodies are found scattered in the superficial mycelium. These are a second sort of fruit-bearing body and contain spores 4 to 6 microns in diameter. They are somewhat lens-shaped and have serrate margins, k. The yellow perithecium is shown at m.

This mould grows scantily upon various media. Upon blood serum it does not grow at all. Milk is made alkaline by it, does not coagulate, becomes thick and stringy and shows the presence of albumoses.

If a solution has developed in it a mould, it is not advisable to filter the solution and return it to stock for the active ingredients have probably undergone some changes. Throw it away.

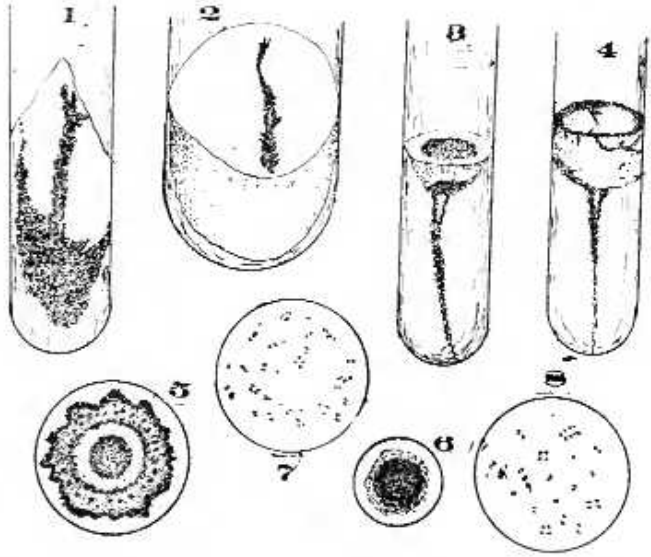
Labrador and Anticosti.—By Rev. V. A. Huard, A. M., Chicoutimi, Quebec. Paper, 8 vo. pp. 505, map and illustrations. Price $1.70 post paid.

The author of this charming narrative is president of a seminary and editor of a scientific magazine at Chicoutimi in the province of Quebec. The book is in the French language and makes delightful reading for the student.

Bacteria that Curdle Milk.

By R. R. DINWIDDIE.

MICROCOCCUS UBERIS.—This bacterium is found in the milk duct of the cow. The cocci are of medium size, arranged in pairs, irregular groups, or sometimes chains of four to six. They are non-motile and readily stained by aqueous solution. They grow at 20 degrees to 37 degrees C. In agar streak culture, fig. 1, surface growth is free, white and spreading over the surface below while

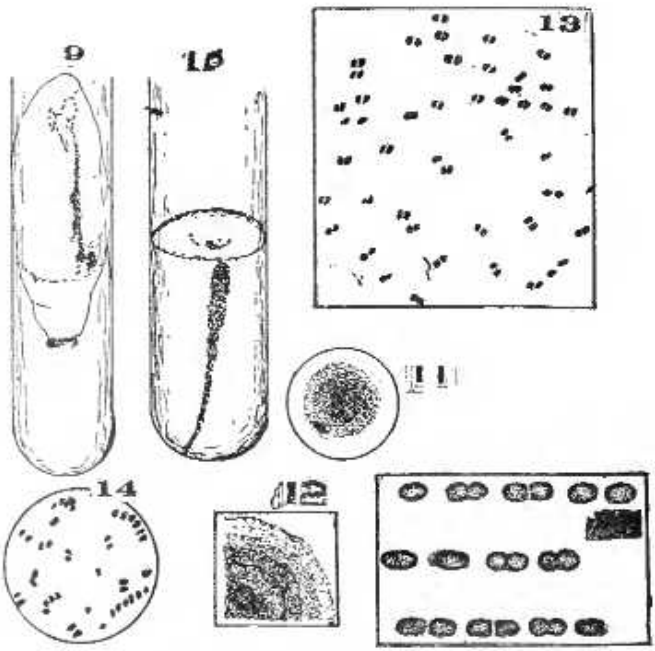


above it is limited to the wire track. Surface, smooth, moist and glistening. Potato culture, fig. 2, at 10 days, shows a free growth limited to the wire track, raised, white, granular.

Gelatin stab cultures appear in fig. 3 (4 days) and fig. 4 (14 days) 22 degrees C. There is early fluidification, a funnel-shaped depression which extends in 10 or 20 days across the tube. In five weeks, half the medium is fluidified.

Gelatin plate surface colony, fig. 5, 3 days, x7, and deep colony, fig. 6, 2 days, x60, both are 22 degrees C. In 24 hours the colonies appear as white points. If x60 they appear greenish yellow. In 5 days, they become 2 to 4 mm in size with a central area and a peripheral zone.

Figures 7 and 8 show cover-glass preparations from bouillon culture, one x600 and the other x1500, taken



with Reichert's ocular 4, objective 1–18. At 20 degrees C., the milk sours and curdles after 4-5 days; at 37 degrees, there is free growth but no curdling.

BACTERIUM LACTARII.—This is found constantly in milk that has soured spontaneously. It is oval, single or in pairs. Chains of 4 to 6 each occur. Fig. 13 shows pairs, with the attached ends square and rounded. Segmenta-

tion occurs at length of 2½ microns. Stain by Gram's method and by the hydro-alcoholic solutions.

Fig. 9 shows agar streak culture, 2 days. It is first visible in 24-48 hours as a faint granulation along the inoculating line. Magnifying, small colonies are made out and are colorless. A yellowish white sediment appears in 24 hours. On glucose-agar the growth is larger. In lactose-litmus agar, the colonies appear all through the medium, pink color from surface to bottom.

Lactose-gelatin with chalk (fig. 10) at three weeks shows larger, opaque colonies, circular and regular in outline. Diameter half a millimeter.

Gelatin plate colonies: deep, 3 days, and surface, 4 days, are shown in figures 11 and 12 enlarged 100 dia. They are quite circular with regular and well-defined margin. Diameter, .25 mm. On potato, there is no growth.

Cover-glass preparations, x1500, are shown in figures 13 and 14, the former a 3-days milk culture and the other a 2-days glucose-bouillon culture. Figure 15 shows growth and segmentation.

The milk forms firm coherent clots in 20-30 hours ordinarily, but in incubator in 12 hours. It is strongly acid with faint sour odor.

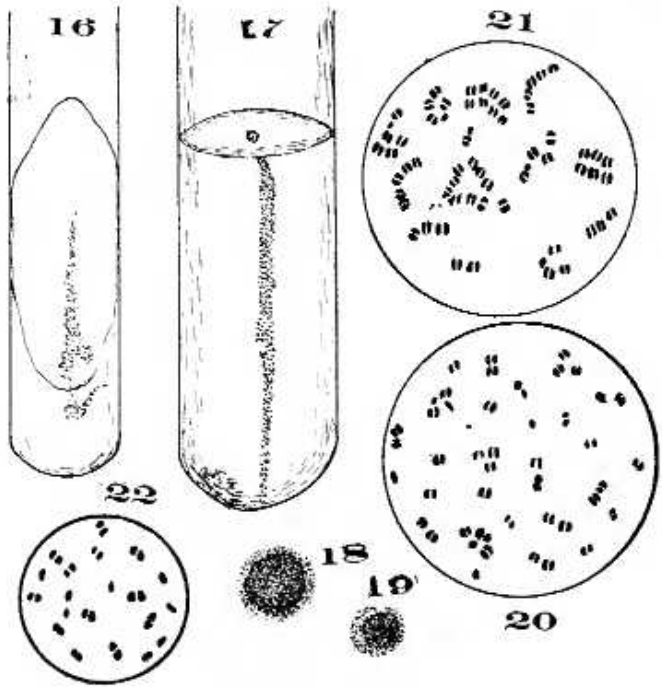
BACTERIUM DISCISSUM occurs in spontaneously soured milk. They are oval, in pairs, in chains or singly. Single forms are half longer than broad—dimensions 1.5 microns by 1 micron. In glucose bouillon, the chains are most abundant and larger than elsewhere. The individual elements of the chains are nearly round, segmented and vary in size as shown in figure 20.

Glucose-agar streak culture of 10 days growth shows as in figure 16. In glucose bouillon the turbidity appears later but is equally dense.

Gelatin tube stab culture of 5 days standing, fig. 17;

gelatin plate deep colony, 6 days, fig. 18, is magnified 100 dia.; gelatin plate surface colony, 5 days, figure 19 is magnified 60 diameters. Cover-glass preparations are shown in figures 20, 21, 22,—milk culture, x1500, in fig. 20; glucose bouillon culture, x1500, in fig. 21; and agar culture, x1500 in fig. 22.

The cultural characters are in nearly every way simi-



lar to those of B. lacterii, but in agar tube the growth is feebler, in gelatin plate the ringed appearance is fainter and the quantity of clear fluid separated from the curd is larger especially at temperature of 37 degrees C.

Those interested in fuller details of this milk problem should send to the Arkansas Agricultural Experiment Station for Bull. No. 45 which is distributed gratuitously.