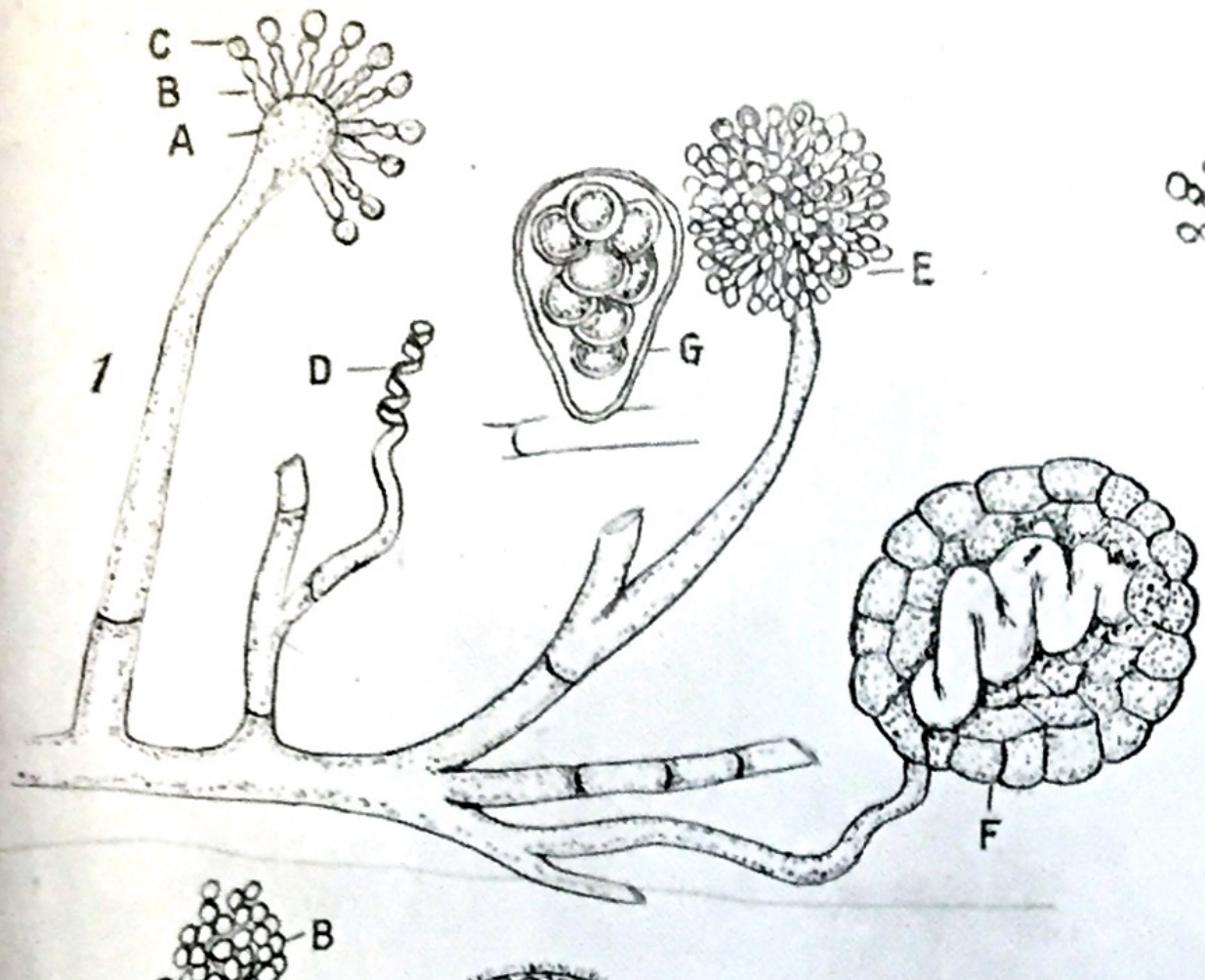

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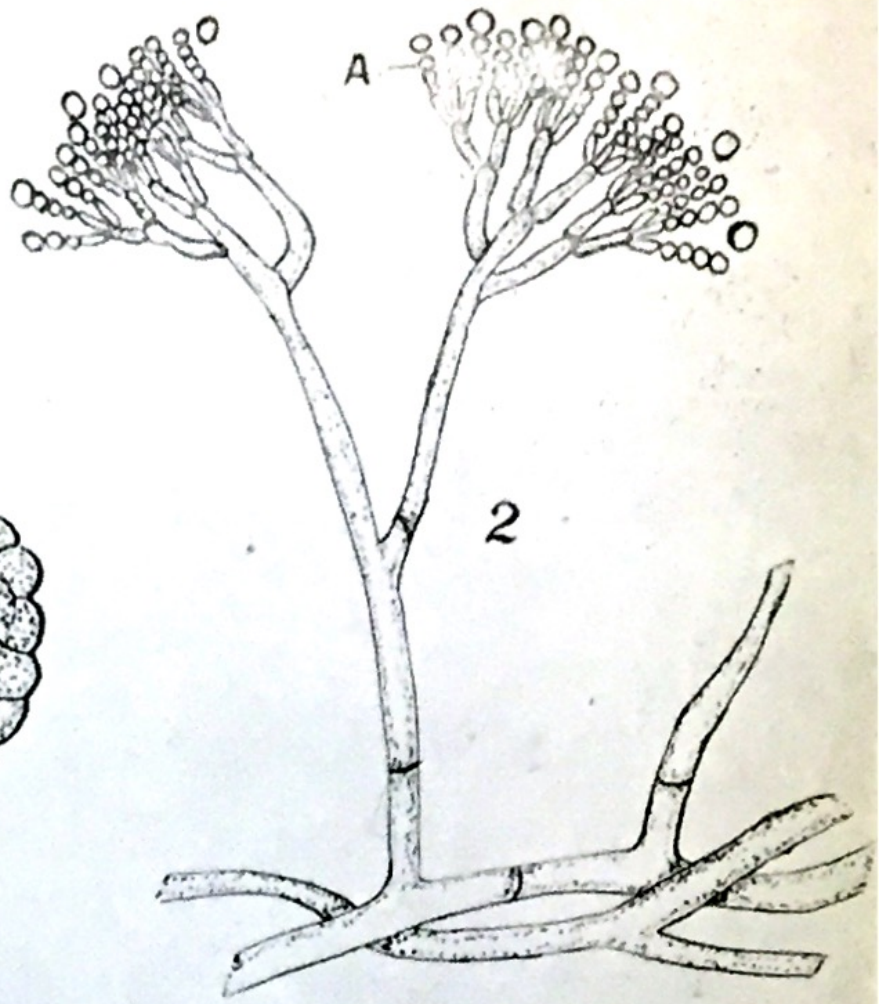

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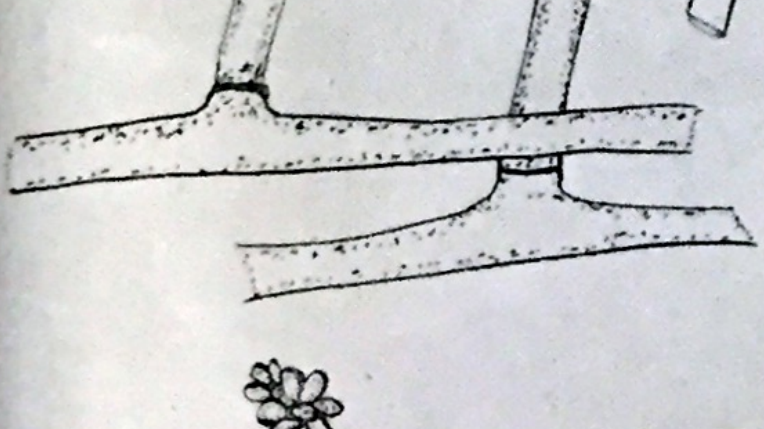

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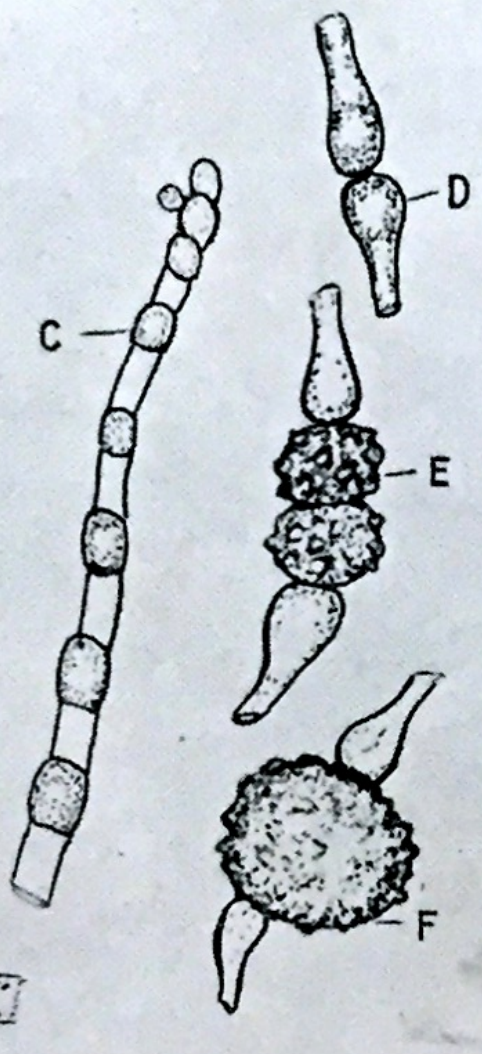

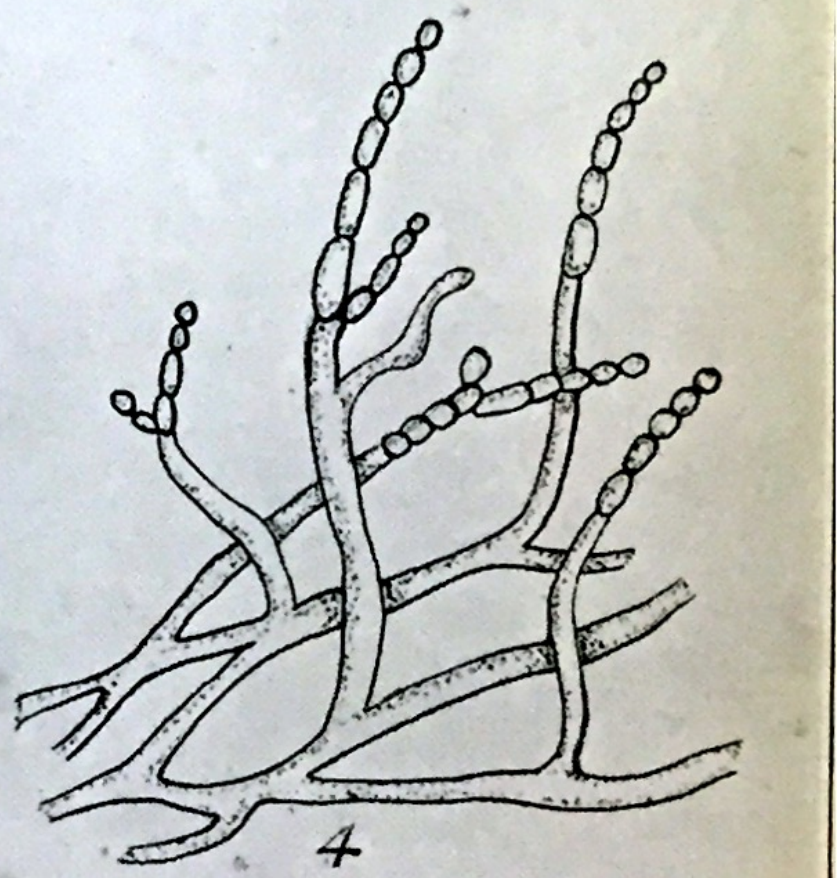

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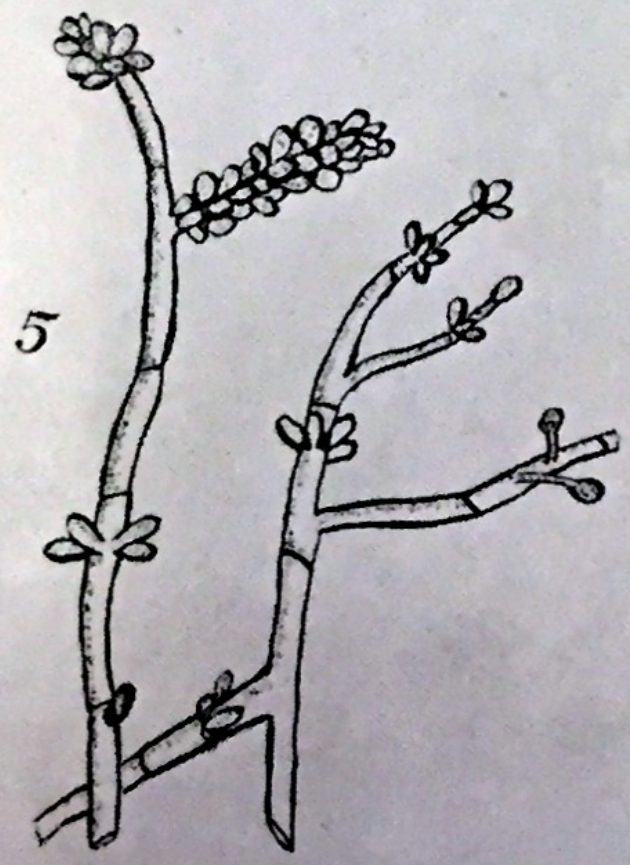

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6

7

forms is not great. Some have believed that this resistance is due to certain bodies called *arthrospores*, which are abnormally large cells with, usually, a thickened cell wall and increased staining properties, formed as a rule in old cultures. Foulerton and others have described similar forms in some of the higher bacteria and consider them spores. (See under Nocardia.)

FIG. 5.—B. diphtheriæ "No. 8" from 9 days' broth pellicle, showing many "branched" forms. Stained with carbol-fuchsin. × 1500 diameters.

FIG. 6.—B. diphtheriæ "No. 8" from 10 days' broth pellicle, showing longitudinal fusion and position of metachromatic granules. Stained with Löffler's methylene blue. × 2000 diameters.

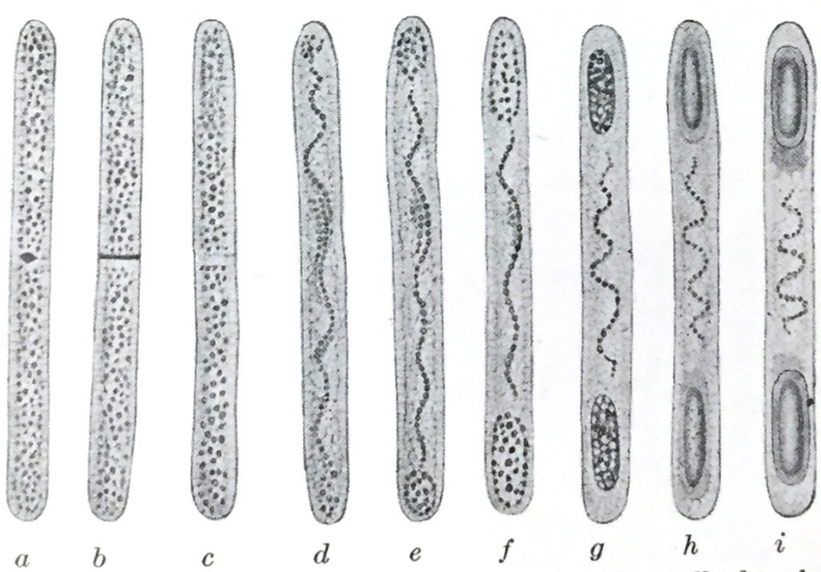


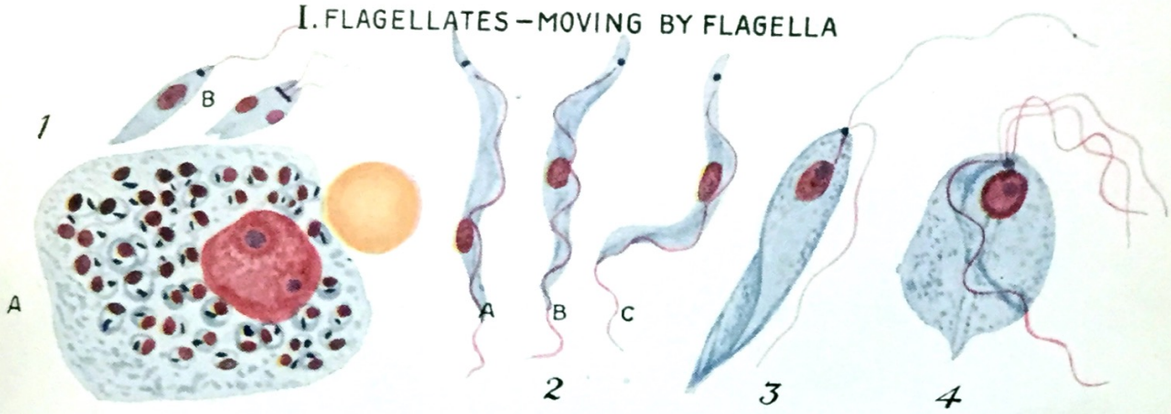
FIG. 7.—Bacillus bütschlii: *a* to *c*, incomplete division of the cell; *d* to *f*, gradual collection of chromatin granules at ends of cells; *g* to *i*, formation of end spores from these chromatin end masses. (After Schaudinn.)

The *true spores* (endospores) of the lower bacteria are definite bodies. These are strongly refractile and glistening in appearance, oval or round in shape, and composed of concentrated protoplasm developed within the cell and surrounded by a very dense envelope (Plate III, Figs. 22–25). They are characterized by their power of resisting the injurious influences of heat, desiccation, and chemical disinfectants up to a certain limit (see chapter on Disinfection). Spores also stain with great difficulty. (See page 79 for details.)

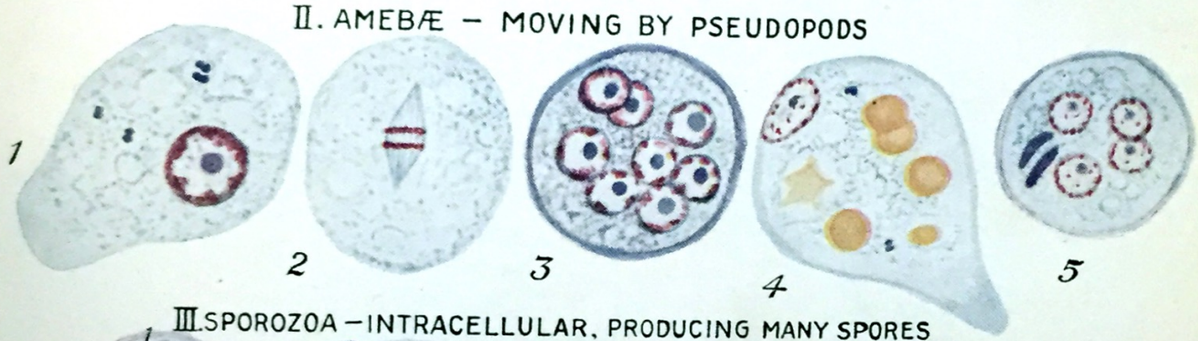
PLATE IV

TYPES OF PROTOZOA

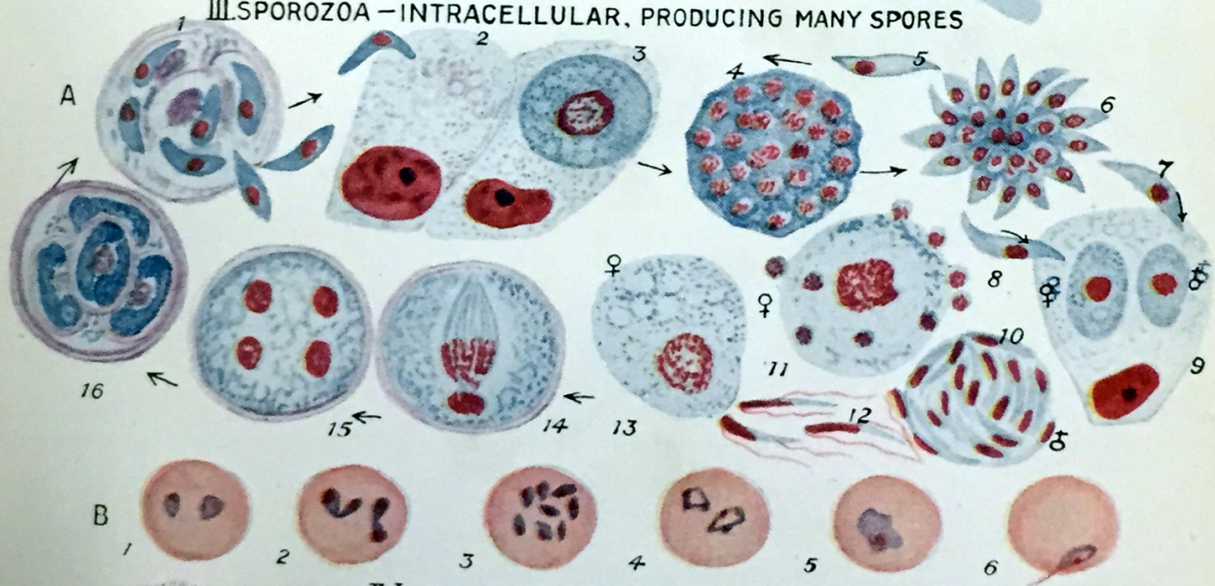
I. FLAGELLATES – MOVING BY FLAGELLA



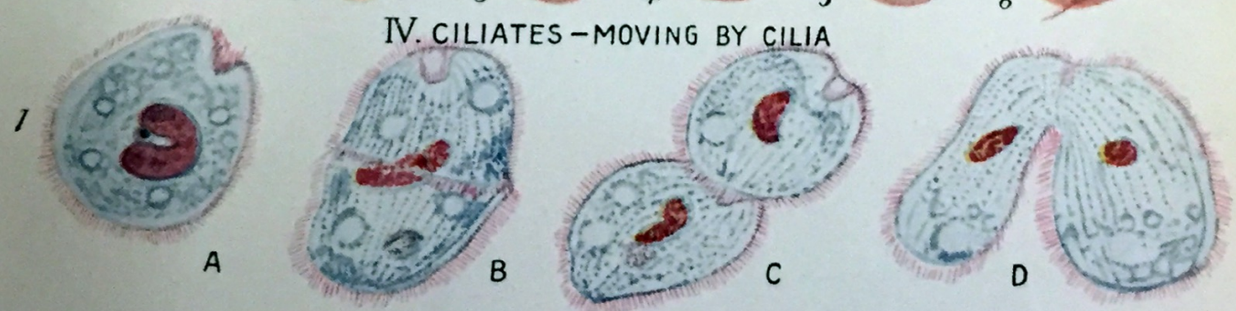
II. AMEBÆ – MOVING BY PSEUDOPODS



III. SPOROZOA – INTRACELLULAR, PRODUCING MANY SPORES



IV. CILIATES – MOVING BY CILIA



A. W. WILLIAMS, DEL.

Very frequently these clumps have the appearance of being built up around a piece of detritus present in the clump. All the organisms comprising the clump seem to have retained part, at least, of their motility, those on the edges being particularly motile, so far as their free ends are concerned.

When motility is very much inhibited these clumps have a peculiar trembling movement, which is like the molecular movement described by Brown.

Fig. 84 shows a cross-section of the drop represented in Fig. 83. Note the same character of the clumps in every focal plane: the large number of motile bacilli and the number attracted to the edge of the drop by the air.

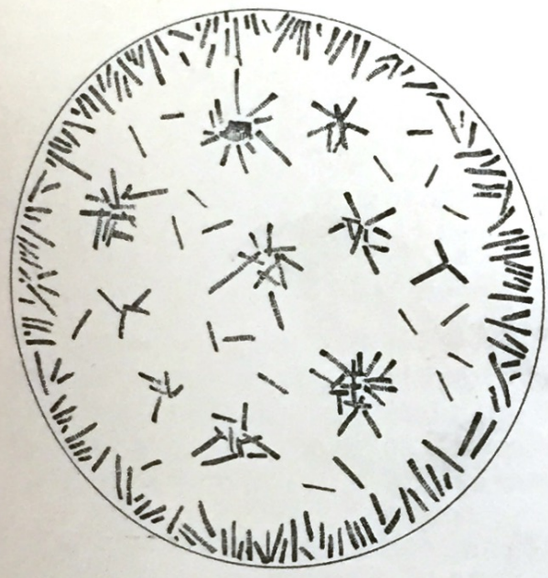


FIG. 83.—Microscopic field, showing the top of a drop of culture with reaction not due to typhoid.

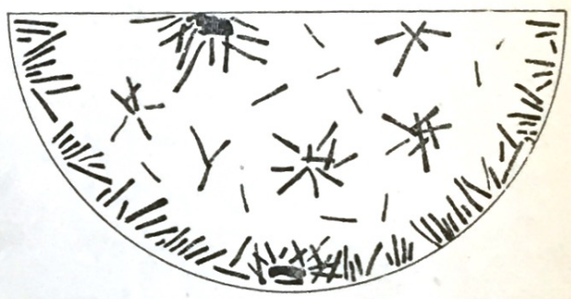


FIG. 84.—Microscopic field, showing a cross-section of Fig. 83.

Comparison of Tube and Microscopic Slide Methods.—The reaction is the same in both and one is as reliable as the other. The ice-box readings are apt to be higher than those obtained by microscopic examination. For diagnostic examinations where haste is necessary and small amounts of serum are available, as in typhoid fever, the microscopic method is preferred. When a delay of twenty-four hours is no handicap and the serum is abundant as in tests for glanders in horses the macroscopic tube test is chosen. For the identification of bacteria the macroscopic test is generally used. Dead cultures are more frequently used in the macroscopic method because the motility is of no importance.

As noted above, the growth of bacteria in fresh blood containing agglutinins inhibits the development of agglutinable substance in bacteria or causes them to produce substances which prevent the union of agglutinin with them. Bacteria should therefore not be grown on serum media when they are to be used in agglutination tests. Even the addition of ascitic fluid to broth has some effect.