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Morphology and Nature of Pleuropneumonia-Like Microörganisms.*

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We have recently isolated from the lungs of rats and mice 5 strains of pleuropneumonia-like microörganisms. The purpose of this note is to indicate that the morphology of these strains, like that of the L_1 strains of Klieneberger,[1] is essentially bacterial.

Most authors regard the organism of pleuropneumonia bovis and similar organisms as in a class distinct from bacteria or other well-known microörganisms. They have a characteristic morphology and colonial appearance. Especially in pathological tissues or exudates they are filterable, and the diseases which they produce are often mistaken for virus diseases. The microbes included by Klieneberger[2] in this group produce tiny colonies consisting of fine pleomorphic, very fragile granules, which later swell up to form large round bodies. The vacuolization and coalescence of these round bodies produce eventually a foam-like appearance of the colonies. Saprophytic strains cultivated by Laidlaw and Elford,[3] and by Seiffert,[4] have been included in the pleuropneumonia group on the basis of filterability and special morphology.[5]

One of us[6, 7] has pointed out that Klieneberger's L_1 strain, isolated from the streptobacillus moniliformis, is but a variant of this bacillus. For it not only can be isolated regularly from this bacillus, but occasionally reverts to it, and it conforms essentially to bacterial morphology. In young colonies, fine bacterial filaments are present, containing deeply stained granules. Part of these forms degenerate, and part swell up to large round bodies. A similar process can be

* The expenses of this investigation were defrayed in part by the Commonwealth Fund. This is publication 30 of the Robert W. Lovett Memorial for the study of crippling disease, Harvard Medical School.

1 Klieneberger, E., *J. Path. Bact.*, 1935, **40**, 93; 1936, **42**, 587.

2 Klieneberger, E., *J. Hygiene*, 1938, **38**, 458.

3 Laidlaw, P., and Elford, W. J., *Proc. Roy. Soc.*, 1936, **120**, 292.

4 Seiffert, G., *Zbl. Bakl. I. O.*, 1937, **139**, 337.

5 Oerskov, J., *Zbl. Bakl. I. O.*, 1938, **141**, 232.

6 Dienes, L., PROC. SOC. EXP. BIOL. AND MED., 1938, **39**, 365.

7 Dienes, L., *J. Infect. Dis.*, in press.

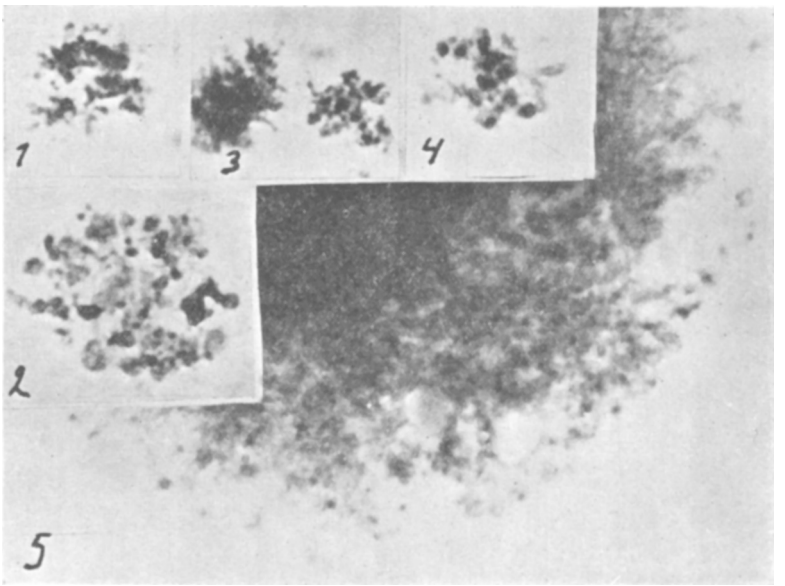

FIG. 1.

Photographs 1 and 2 represent colonies of the rat strain after 24 and 48 hours of incubation. Photographs 3 to 5 represent mouse strain 334. 3 and 4 illustrate young colonies with filaments and round bodies of different sizes. 5 shows the edge of a 48-hour colony consisting of large round bodies partly vacuolized.

Magnification (all photographs) is 1:2000.

observed occasionally with various bacteria, *i. e.*, colon or influenza bacilli. The L_1 strains differ from the other bacteria only by the regular occurrence of this phenomenon.

The morphology of the strains was studied by staining directly on the agar the developing colonies. Alkaline methylene blue or toluidin blue was used according to a technic previously described.[7]

The colonies of the rat strain remained very small (10 to 20 micra). They consisted at first of deeply stained pleomorphic granules. Following 24-48 hours of incubation, the granules swelled up to fairly large round or oval bodies. After repeated transfers the colonies grew larger.

The murine strains resemble more the L_1 organisms. In the young colonies there are fine curved filaments containing deeply stained granules. Even in the youngest colonies, the filaments are already partly transformed into rows of granules and round bodies. After 48 hours, the surface of the colonies is composed chiefly of large round bodies. These are often filled with tiny granules. After a longer period of cultivation some of the colonies grew fairly large (about 1 mm). In these the elements resembled regular bacterial forms

more closely than was the case immediately after isolation. But we did not observe a reversion to normal bacterial morphology as was observed in the case of the L_1 strains.

We were unable to verify the presence of fine non-bacterial filaments such as described by Klieneberger. No elements inconsistent with bacterial morphology were visible in the colonies of our strains.

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Diagnosis of Echinococcal (Hydatid) Disease in Man by Intradermal Reaction to Rabbit *Cysticercus* Antigen.

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A skin test originally described by Casoni[1] and since modified by several investigators is generally considered to be the most reliable single guide to the presence or absence of suspected hydatid infection in patients.[2] The test is usually performed by injecting intradermally 0.1 to 0.5 cc of carbolized fluid obtained from a fertile hydatid cyst of either sheep or man. This fluid contains an antigen which maintains its potency for months. Both immediate and delayed skin reactions, consisting of wheals with pseudopods and surrounding erythema, have been described. The necessary hydatid fluid may be readily obtained in certain world areas, such as Southern Australia, where echinococcal disease is common in both man and animal. However, throughout North America the supply of cysts is small due to the rareness of the disease, and the clinician is often confronted with a diagnostic dilemma when the antigen is unavailable.

In the present communication observations are reported concerning an antigen which may be procured readily from cysticerci occurring in rabbits. Tests made thus far indicate that patients infected with echinococcus, or those who have recently had cysts removed, will give positive skin reactions with the antigen, whereas essentially

1 Casoni, T., *Folia Clinica Chem. Micros.*, 1911-1912, **4**, 5.

2 For reviews of the literature, consult Taliaferro, W. H., *The Immunology of Parasitic Infections*, 1929, The Century Co., New York; and Culbertson, J. T., *Arch. Path.*, 1938, **25**, 85, 256.