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Filtrability of the Chromogenic Culture (Duval) Obtained from Human Leprosy.

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Within recent years much has been written regarding filtrable forms of bacteria, especially by Hadley, Blanc, Wolbach, Tunnicliff, and Duval. The literature reveals but few reports upon work dealing with the filtrability of acid-fast cultures recovered from the human leprous lesion. It occurred to one of us (Kriz) that *B. leprœ* chrome (Duval)[1] might under certain environmental conditions exhibit a filtrable stage. Walker,[2] and Sweeney[3] state that they obtained a filtrable form of the bacilli of human and rat leprosy, using filtrates from tissue-emulsions. These authors claim to have cultured from the filtrates a facultative acid-fast microörganism comparable in morphology to the bacilli in the respective tissue-lesions. The bacilli growing out from planted filtrates exhibited a wide range of morphology. Non acid-fast coccoid forms later became acid-fast bacillary types, which according to Walker and Sweeney indicate not only pleomorphism but bio-chemical inconstancies of the microörganisms with which they worked. This feature is of course not new for any acid-fast microbe. Kedrowski[4] has long maintained that there are wide variations in morphology and tinctorial properties with respect to acid-fastness for his culture from the human leprous lesion. Markianos[5] claims to have obtained a filtrable form of *B. leprœ muris* from rat tissues, with which he claims to have produced experimental leprosy in these animals.

We have tested culture-filtrates of both old and recently isolated strains of the chromogenic acid-fast bacillus (Duval). After obtaining good growth on glycerine agar, a portion of the surface growth was transferred to separate flasks containing 400 cc of glycerine broth at pH 7.4. After 2 weeks' incubation there was a

1 Duval, C. W., *J. Exp. Med.*, 1910, **12**, 649.

2 Walker, E. L., and Sweeney, M. A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1162.

3 Walker, E. L., and Sweeney, M. A., *J. Inf. Dis.*, 1935, **56**, 97.

4 Kedrowski, W., *Z. f. Hyg. u. Infekionskr.*, 1901, **27**, 52.

5 Markianos, P. J., *Bull. Soc. Path. Exot.*, 1929, **22**, 410.

marked increase in turbidity. At weekly intervals, over a period of 11 weeks, 20 cc from each flask were passed through a Seitz filter under a pressure of about 20 mm of mercury. Just immediately preceding filtration, preparations were made and stained to determine morphological features and acid-fastness of the bacilli. Two cc portions of the filtrates were transferred to glycerine-agar slants in tubes plugged with paraffined cotton and topped with tinfoil to prevent drying of the medium, and incubated at 37.5°C. At no time was there macroscopical or microscopical evidence of growth over the entire period of observation (3 months).

Summary. It would appear from the work of others that a filtrable form of *B. lepræ* exists *in vivo* for the respective bacilli of human and rat leprosy, since *in vitro* growth is said to have occurred from the cultured filtrates. Employing filtrates of cultures of *B. lepræ chrome* (Duval) we have been unable after repeated attempts to demonstrate a filtrable stage of this microörganism.

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Variations in Pulmonary Vital Capacity in Health: Daily, Seasonal, and at Moderate Altitudes.

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A. Daily and Seasonal Variations. Occasionally writers draw various deductions from small alterations in the vital capacity of their patients. Anyone, however, with any experience in spirometric work is aware of the daily variations in healthy people, which may amount to several hundred ccm. These are usually disregarded or explained as due to temperature and pressure. I am not aware, however, of any observations of such variations over prolonged periods.

When air is taken into the lungs it is not only heated to a temperature close to that of the body but it becomes charged with water vapor. When this air is expelled with all the forces of expiration into a spirometer at ordinary room temperature and pressure we would expect: (a) A contraction of volume with perhaps condensation of water vapor resulting in a spirometric reading less than the true vital capacity, an error which would increase with falling temperatures, and (b) the final volume of the mass of air forcibly ex-