force. The character of pulse curves, taken either with a Hürthle or other spring manometer, placed in direct communication with an artery, or by means of the sphygmograph, depends very largely on the "lability" of the conducting arteries. It is arterial "lability," not reflection of waves, which modifies the form of the pulse curve taken in different arteries. While the pressure waves produced by the heart may remain the same, the form of the sphygmogram may be altered, and what has been termed a "high" or a "low" pressure curve may be produced by variation in the "lability" of the conducting arteries. The wall of an artery is supported by the surrounding tissues and skin, the whole being permeated with blood; it will be a matter for further consideration as to how far the lability is affected by the condition of the surrounding tissues. Comparison of figs. 8 and 9 shows how large a part the tissues normally take in supporting the arteries.

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## *On the Probable Value to* Bacillus coli *of "Slime" Formation in Soils.*

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During the course of an investigation into the causes of variation in the physiological activity of *Bacillus coli*, a number of experiments were started, in which soils, either virgin or mixed with cow dung or human excreta, were inoculated with cultures of *B. coli*, together with cultures of various soil organisms so different from the colon organism that they could not be mistaken for it on plating out. The requisite quantity of soil was placed in a layer about $\frac{3}{4}$-inch deep in large flat litre-bottles, and the cultures were added in the form of emulsions in physiological salt solution, made from agar slopes. Sufficient water was also added to make the soil visibly moist. The bottles were closed with cotton-wool plugs and kept at ordinary room temperature in the dark. Controls which were inoculated with all the organisms except the *B. coli* were started at the same time. The soils were examined from time to time by withdrawing about 5 grm. by means of a sterile tube, shaking this up with 50 c.c. of sterile water, spreading plates directly on to ordinary agar and incubating at 20° C.

It was found very difficult to isolate the *B. coli* in this way because of the rapid and expansive growth of the other organisms present, and because the

experimental organism did not usually grow in a typical manner, but in large watery colonies, which were at first not recognised as *B. coli*, and were also soon involved with other growths on account of their spreading nature. It was therefore necessary to employ the usual method of preliminary inoculation into bile-salt glucose broth, followed by plating out into ordinary (+I), or bile-salt agar. In this way *B. coli* was always readily isolated, but the tendency to form large, moist, slimy colonies was still marked, a characteristic to which I have directed attention before.

The results were not of any great interest from the point of view of variation. From time to time, during the first 18 months of the investigation, apparently typical *coli* were isolated which refused to grow in peptone water or to attack any of the test substances. In many cases, the original culture from the plate failed to attack dulcitol and sometimes mannitol, but these failures were not of a permanent character. Towards the end of the experiment quite typical organisms only were obtained. The necessary use of bile-salt broth possibly is adverse to the separation of atypical organisms in the presence of a preponderance of typical forms. There was not apparently during the whole course of the experiment (which lasted three years) any marked diminution of the original *B. coli*, as it could be recovered in all cases from at least 0·00001 grm. of the soil.

The remarkable point of the investigation lies, however, in the fact that throughout the course of the experiment no further addition of water was made to the flasks. The control flasks, which did not contain *B. coli* (though all the other soil organisms were present), dried up within a few months of the start. In all the flasks which contained *B. coli* not only did the flasks retain their moisture for three years, but during the first 12 months of the experiment had evidently taken up large quantities of moisture from the atmosphere, and in one or two instances the soil became completely water-logged.

It seems evident that this extraordinary behaviour is connected with the *B. coli*, and in view of the fact, which I have constantly noticed, that this organism can easily produce "slime" (without the presence of sugar), and that when grown in this manner in soil it certainly does so, it seems reasonable to attribute the water-absorption of the soil to this curious property. These results possibly give at the same time some explanation of the well-known power of many organisms which occur in soil, especially the "nodule" bacteria, to form "slime."

The viability of *B. coli* for such a long period is also remarkable, but cannot, of course, be taken as true for ordinary soils, as there are bactericidal influences at work in such, which have been destroyed by the initial sterilisation necessary in these experiments.