

in 50 per cent alcohol. Physiological saline is then injected and then aspirated by means of a hypodermic syringe with a 27 gauge needle.

The fluid thus obtained is then cultured in deep beef infusion glucose blood broth and in brain medium. It is then streaked out on blood agar plates.

To date, 149 aspirations have been made from gingival tissue of twenty-four men at San Quentin Penitentiary. These 149 tests have yielded positive cultures in ninety-seven instances or 65 per cent. The distribution of these cultures according to morphology and cultural reactions together with Holman's classification for the streptococci is as follows: Staph. albus, 53; Staph. aureus, 1; Strep. pyogenes, 13; Strep. equimus, 3; Strep. angiosus, 15; Strep. salivarius, 28; Strep. mitis, 26; Strep. infrequens, 3; Strep. ignavus, 6; Strep. non-haemolyticus II, 1; Strep. equi, 1; Micrococcus gasogenes, 1.

Dr. G. W. Simonton, Miss Adrienne Williams, and Miss E. J. Rose have been associated with me in this work and in more complete publication will be given coauthorship in the subdivisions.

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The effect of dry grinding upon gels.

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The writers have shown that dry grinding in a pebble mill renders starch largely soluble in cold water¹. They are now able to report that similar treatment renders gelatin temporarily soluble in cold water. Solutions thus prepared set to a gel after a time. The water insoluble colloids, gliadin and glutenin, which together form wheat gluten, are not rendered materially soluble by sixteen hours grinding of the flour from which they are prepared, though their physical properties are changed. If gluten be washed from

¹ PROC. EXP. BIOL. AND MED., 1924, xxii, 60.

such flour in the usual way, and if its swelling in acid be studied by the method of Upson and Calvin², it is found that the gluten, prepared from the excessively ground flour, swells less than the control gluten prepared from the same flour before it was subjected to overgrinding. The difference is so definite that it is possible by mere inspection to distinguish the two kinds of swollen gluten. The control gluten, as it swells in weak acid, becomes translucent, slimy and runny; while gluten from the same flour after grinding, remains more opaque, swells less and is much firmer to the touch.

It is thus apparent that rather mild mechanical treatment is capable of affecting profoundly the physical properties of the biologically important gel-forming colloids so far studied. It is difficult to harmonize the results herein recorded with the hypothesis defended by Katz³ that swelling is merely a special case of solution. They rather speak for the view that swelling is dependent—at least in some degree—upon structure and that grinding possibly modifies this structure. The character of the structure thus modified may be relatively coarse, such as a reticulum represented by the continuous phase. Or it may be a colloidal or even a molecular structure that is broken. Or, finally, there may be jumbling of an orderly arrangement of the molecules such as the X-ray examinations of Herzog, of Katz⁴ and of Sponsler⁵ have made probable in certain gels. Indeed Sponsler⁵ has reported that the X-ray spectrum of starch is destroyed by grinding. Investigations are in progress to determine which of these possibilities is the most probable.

² Upson, F. W., and Calvin, J. W., *J. Am. Chem. Soc.*, 1925, xxxvii, 1295.

³ Katz, J. R., *Ergeb. exakt. Naturwissenschaften*, 1924, iii, 316.

⁴ Katz, J. R., *op. cit.*

⁵ Sponsler, Clenus Lee, *Am. J. Bot.*, 1922, ix, 471.