

themselves cause interesting alterations of smooth muscle responses to certain autonomic poisons.

The results obtained on smooth muscle of the intestine and uterus agree with the older observations of Danilewsky¹ on cardiac muscle of perfused frog hearts which responded to cholesterol with increased systolic contractions without appreciable changes in rate and tonus. They are also in line with vasoconstriction (tonus increase) from cholesterol in perfused organs recently reported by Handovsky,² who attaches importance to this action of the product in certain serum effects. These various augmentations of muscular activity by cholesterol together with other reputed effects on vessels, on metabolism, in pathological states, etc., indicate that cholesterol is a physiologically active product. The study is being continued.

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The anaerobic bacteria of the oral cavity.

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Investigation of 55 samples of saliva collected from 43 individuals showed, 1st, that sporulating anaerobes are not commonly found; 2nd, that when they are found it is usually impossible to detect the same species in subsequent samples from the same mouth.

Only 6 specimens yielded sporulating anaerobes, which included *B. Welchii*, *B. bifementans*, an unidentified non-pathogen, *B. tetanomorphus*, and a strongly toxicogenic *B. tetani*. This is believed to be the first record, with rigid proof, for *B. tetani* from the mouth. No importance is to be attached, however, to the occasional presence of any of these micro-organisms in the oral

¹ Danilewsky, *Arch. f. d. ges. Physiol.*, 1907, cxx, 181.

² Handovsky, *Klin. Wchnschr.*, 1924, xxx, 3.

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cavity; all attempts to prove their continued residence there failed. There was likewise no correlation of these findings with dental conditions.

Aerobic spores were also encountered in 16 samples, but not identified owing to the present unsatisfactory status of their taxonomy. Both aerobic and anaerobic sporulating bacteria are evidently transient saprophytes in the mouth, and there is no evidence that either group has any direct pathologic significance in relation to pyorrhea. Certain species, however, may participate in the deposition of salivary calculus and so indirectly contribute to predisposing irritations. Opinion is reserved as to their responsibility for pulp decay in dental caries.

More importance is attached to the non-sporulating anaerobes of the mouth. While we have not failed to appreciate the numerical frequency of spiral and fusiform organisms in saliva through the use of the dark field microscope, these did not appear in our cultures.

Our present emphasis is upon the almost universal occurrence of a minute, Gram-negative, non-sporulating, gas-forming obligate anaerobe of which we have isolated 24 strains from 35 samples collected from 23 persons. This organism is mainly responsible for the abundant gas almost invariably seen in primary brain-medium cultures from unheated saliva. It is identical with the so-called *Staphylococcus parvulus*, (Veillon), recently recovered by Holman and Krock,¹ which they thought resembled *B. pneumosintes* (Olisky and Gates) in filterability. However, after studying two of their strains and 22 of our own, we disagree both as to its nomenclature and its ability to pass through carefully controlled Mandler filters.

This germ differs from *Staph. parvulus* in failing to produce any fetid odor and in producing abundant gas. It was first discovered by Lewkowicz,² working with Veillon in Cracow in 1901, in the mouth of an 8 day old baby, and described under the name *Micrococcus gazogenes alcalescens anaerobius*; in accord with modern scientific usage we suggest *Micrococcus gazogenes* (Lewkowicz).

M. gazogenes is a minute diplococcus less than 0.5μ in length

¹ Holman, W. L., and Krock, F. H., *Proc. Soc. Exp. Biol. and Med.*, 1923, **xx**, 280.

² Lewkowicz, X., *Arch. de med. Exper.*, 1901, **xiii**, 633.

and breadth, Gram-negative, non-sporulating, non-motile and obligately anaerobic. These properties have caused it to be overlooked in most modern work on the mouth flora.

Deep brain is the best medium for its cultivation; no blackening or digestion occurs with or without added iron. It may be isolated from deep agar colonies, which resemble a buckwheat in form. Blood agar surface colonies are small, round, moist appearing, raised, grayish white and non-hemolytic. Gelatin is neither liquified nor blackened. The only visible change in milk is gas production. Broth cultures become turbid and produce gas. No acid is formed in the presence of glucose, levulose, sucrose, lactose, maltose, inulin, mannitol, glycerol or salicin; all cultures remain neutral or become alkaline. Forty-eight separate tests for filterability were made with totally negative results.

Most of our data failed to indicate any direct pathogenicity for rabbits, guinea pigs or mice. There is some evidence that it reduces the resistance of rabbits toward other pathogenic microbes of which they are carriers, notably *coccidia*.

Ten rabbits were immunized by intravenous injection of live cultures, with production of powerful agglutinins (all over 1-10,000) which distinguish 2 serologic groups, group A containing 22 strains, group B, 2 strains. Holman's cultures fell into group A. But, while normal rabbits may harbor *M. gazogenes*, yet produce no agglutinins except under inoculation, humans not infrequently produce low grade agglutinating serums (1-40) the strongest of which have come from persons free or practically free from *gingival* lesions, suggesting that there may be an immunologic factor relating to this micro-organism in pyorrhea alveolaris.