

Factors Concerned in Demonstrating Utilization of Carbohydrates by Organisms of the Genus *Mycobacterium*.

MALCOLM H. MERRILL. (Introduced by M. S. Fleisher.)

From the Department of Bacteriology and Hygiene of the St. Louis University School of Medicine.

In plain broth cultures of organisms of the genus *Mycobacterium* I have shown that the method of incubation definitely affects the reaction changes produced. Cultures sealed from the atmosphere were shown to produce only slight growth with an accompanying slight drop in the pH of the media. This slight growth was shown to be due to lack of oxygen and the slight reaction change to the acid side has been shown to be due to production and retention of carbon dioxide. Cultures not sealed from the atmosphere were shown to become progressively alkaline.

Reaction change determinations, using a modification of the method of Long and Major,¹ upon mannite, galactose, and dextrose broth cultures of 9 organisms of this genus showed only 3 outstanding variations from the plain broth control. These 3 were as follows: *Myc. leprae* and *Myc. phlei* in mannite broth and *Myc. chelonae* in dextrose broth.

These results, as well as others, showed definitely that the primary change in reaction is not to the acid side when these organisms are grown in carbohydrate broth. The suggested explanation of the peculiarly characteristic action of organisms of this genus when grown in carbohydrate broth was that these organisms utilize the carbohydrates completely, no cleavage products remaining in the media. This characteristic is undoubtedly closely associated with the strict aerobic nature of these organisms. It was concluded that the method of determining carbohydrate utilization by noting the appearance of acid in the media, which is the method generally used for such determinations, is not applicable to the determination of carbohydrate utilization by organisms of the genus *Mycobacterium*.

Furthermore, the reaction curves are influenced to such a slight degree by the addition of carbohydrates to the plain broth, regardless of whether or not the carbohydrates are utilized, that reaction curve determinations constitute an indefinite and impracticable method of determining carbohydrate utilization by organisms of this genus.

¹ Long, C. R., and Major, A. L., *Am. Rev. Tuber.*, 1922, v, 715.

It was noted that the general tendency was for the cultures to increase in pH with less rapidity in the presence of carbohydrate. This was attributed to the protein sparing action of carbohydrates.

3960

Clinical Pathology and Bacteriological Study of Non-erupted Mandibular Molars.*

FRANK HARUYUKE ITO. (Introduced by John Albert Marshall.)

From the Department of Biochemistry, University of California Medical School.

This report suggests a classification of the various lesions of soft tissues produced by the difficult eruption of mandibular third molars. In addition it presents a bacteriological study of dental pulps dissected from embedded teeth which were extracted.

Unerupted teeth are classified as either impacted or embedded depending upon their relation to adjacent teeth and overlying bone. Both types may produce neuralgia and other lesions of nerve, muscle or organs of special sense. The local inflammatory reactions are classified under 4 general heads: (1) Simple pericoronitis; (2) Suppurative pericoronitis (acute and chronic); (3) Diffuse pericoronitis; (4) Hypertrophic or hyperplastic pericoronitis. These several conditions require certain precautions in preliminary treatment but call ultimately for the removal of the tooth.

The bacteriological study of the vital pulps of unerupted third molars is a virgin field. The organisms of dental caries and pyorrhea have been extensively studied but no report has been published so far as we have been able to discover, of a bacteriological research upon dental pulps of embedded teeth. Only teeth with unbroken or non-mutilated crowns and roots were utilized. The technic of sterilization of tissues and instruments before and after extraction was carefully checked against accidental contamination from bacteria.

From an examination of embedded and impacted teeth where pericoronitis had developed it was found that over three-fourths gave cultures of non-hemolytic green producing streptococcus. This relative frequency is probably due, first, to the fact that unerupted third molars have larger apical foramina than erupted teeth. Thus, there is greater opportunity for organisms to gain access to the pulp.

* Submitted in partial satisfaction for the requirement of Master of Science degree, University of California.