17246. Is the Salivary Lactobacillus Count a Valid Index of Activity of Dental Caries?*

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(Introduced by P. C. Jeans.)

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Lactobacillus counts are used widely as an index to the activity of tooth decay. Much of the current philosophy relating to the cause and control of dental caries is based on the premise that the Lactobacillus count of the saliva provides a dependable prediction medium as to whether the individual in question is likely to develop tooth decay within the reasonably near future. Yet few studies have been reported wherein Lactobacillus counts have been correlated individually with the previous and subsequent progress of tooth decay over long periods of time for large numbers of subjects. Studies of that type are needed to show the validity of the Lactobacillus count as a diagnostic or prognostic agent. The study reported herewith was designed to supply evidence as to the significance of the Lactobacillus count to the individual subject.

As a part of a larger and more general survey, the Lactobacillus counts from the saliva of 64 teen-aged girls have been compared with the progression of tooth decay observed for not less than 30 months for each individual subject. The data include 407 separate Lactobacillus counts. The dental examinations were made recurrently from July, 1946 to January, 1949; the Lactobacillus counts were made on successive occasions from March, 1948 until January, 1949. The State Hygienic Laboratories made the bacterial counts, as a part of the service they provide to the dentists of the state for clinical diagnosis and prognosis.

Generally speaking, there was a slight trend toward parallelism of the Lactobacillus counts and rates of progression of caries when massed data were used. However, when the group as a whole was subdivided according to the rate of caries progression, there was little difference between the range of Lactobacillus

TABLE I.
Lactobacillus Counts from 64 Subjects Observed Serially for 2½ Years.

	(a) those with no advance of caries	(b) those with greatest advance	(c) total group
No. of subjects	11	15	64
No. of counts	68	105	407
Mean number of Lactobacilli per cc	92,500	112,000	104,500
S.D.	70,000	106,300	88,500
S.E. mean	8,500	10,400	4,040
Decile rating:			
10th	30,000	35,000	30,000
20th	37,000	48,000	43,000
30th	46,000	60,000	50,000
40th	60,000	65,000	60,000
50th	70,000	80,000	72,000
60th	92,000	96,000	90,000
70th	100,000	125,000	120,000
80th	149,000	150,000	144,000
90th	180,000	200,000	180,000
100th	360,000	720,000	720,000
Avg. No. of new DMF tooth surfaces per annum	None	more than 3.5	2.12

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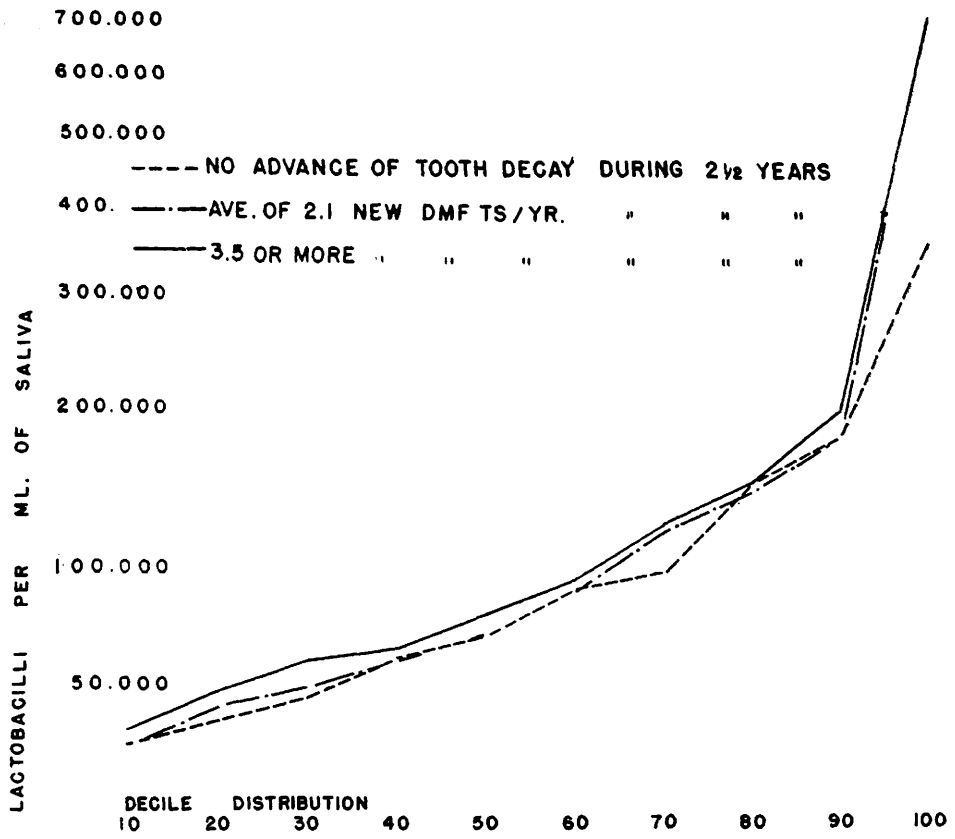

FIG. 1.

Decile range for Lactobacillus counts observed from saliva of teen-aged girls whose rates of progression of tooth decay (number of newly affected tooth surfaces: decayed, missing or filled: per annum) were observed individually for not less than 30 months. Separate curves are shown for 11 girls with zero progression, for the 15 girls with the most rapid progression, and for the total group of 64 subjects. The hundredth per centile represents the highest value observed for each sub-group.

counts observed among those with the least and those with the greatest progression of tooth decay.

Eleven of the girls showed no measurable progression of tooth decay throughout the period of more than 2½ years, when scored according to the number of new decayed, missing or filled (DMF) surfaces which developed during the interim. The range of the Lactobacillus counts observed from these girls' saliva samples has been contrasted with the range for the entire group of 64 subjects, and also with the range observed among the 15 girls whose caries progression rates were the highest. The results are summarized in Table I and Fig. 1.

Emphasis is directed toward the high Lactobacillus counts observed among those children who had had no progression of tooth decay during the 20 months which preceded their first Lactobacillus count, and who continued free from evidence of caries advance at least for the 10 months which followed. Obviously the persistence of high Lactobacillus counts in these children's mouths had not led to the initiation of tooth decay during the period of observation. Moreover, for these 11 girls out of a group of 64 subjects the Lactobacillus count failed to serve as a proper index of caries susceptibility. Furthermore, analysis of the remainder of the group shows such inconstancy of relationship between the magni-

tude of the Lactobacillus count and the relative rate of caries progression that one cannot consider the test as definitive within this group for the diagnosis or the prognosis of caries activity for the individual subject.

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17247. Nucleoproteins and the Cytological Chemistry of *Paramecium* Nuclei.*

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There are many exceptions to the classical definition of a cell as "a mass of protoplasm containing a nucleus."[1] Numerous examples are known of binucleate and multinucleate protoplasmic masses. In most cases the nuclei are all alike, but in binucleate ciliated protozoa such as *Paramecium*, the two nuclei are markedly different in size, and are therefore known as the macronucleus and the micronucleus. There are also considerable differences in behavior of these two nuclei. It is the general view that the macronucleus is a "somatic nucleus" serving the indispensable physiological needs of the organism in vegetative stages when no detectable effect of the micronucleus can be observed.[2] The micronucleus appears to be of chief importance as a potentially germinal structure, functioning in the nuclear interchange and reorganization which take place at conjugation or autogamy.[2] The present paper briefly reports the results of a study of the nucleoprotein composition of macro- and micronuclei in vegetative individuals of *Paramecium*; experiments were designed to answer the question whether in these stages the two nuclei are as unlike as other experimental evidence indicates them to be.

Experimental. The chemical constituents of nuclei are mainly nucleoproteins, and the quantitative technics of cytological chemistry are particularly suited to analysis and localization of these substances within individual nuclei. The procedures used in this investigation permit the computation of relative concentrations of nucleic acids and proteins from specific chemical reactions which have been shown to be applicable to properly fixed cytological preparations. Analyses were made by microscopic photometry of total and nonhistone protein from modifications of the Millon reaction,[3,4] of desoxyribose nucleic acid (DNA) from the Feulgen nucleal reaction,[5] of total nucleic acids and polynucleotides (removable with hot trichloroacetic acid) from the absorption in the ultraviolet (near 260 mμ) of their purine and pyrimidine bases[6,3] and of ribose nucleic acid (RNA) by difference in absorption at 260 mμ after enzymatic digestion with protease-free ribonuclease.[7]

Determinations were made on a culture of *Paramecium caudatum* which was raised on a baked lettuce medium inoculated with *A. aerogenes*[8] and kept under constant feeding

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