

tions, all of which showed dramatic results. The first had a cheek carbuncle with an indurated base inches in diameter; the second, an infected wound in the right palm; and the third, an ulceration with marked redness and induration over the chin and with enlarged and tender submaxillary lymph glands. The first two were staphylococcal infections; the last, streptococcal. Citrinin-sodium bicarbonate powder was applied locally to the infected region, and the indurated base was infiltrated with sodium-citrinin solution (1 per cent), after which it was dressed with citrinin-soaked gauze. At first, all experienced some needling pain but no other discomfort. The infected area dried up in 6-18 hours, the crust formation being followed by rapid healing.

The study on citrinin is still being carried on in the Pincomb Chemical Works along chemical, bacteriological, and clinical lines. The details of the above experiments will be published elsewhere.

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Lactobacillus acidophilus Counts in the Saliva of Children Drinking Artificially Fluorinated and Fluorine-free Communal Waters¹

SIDNEY B. FINN and DAVID B. AST

*Division of Maternal & Child Health,
New York State Department of Health, Albany*

It has been demonstrated that there is a direct correlation between the number of *L. acidophilus* organisms in the saliva and dental caries activity in the mouth (3). In mouths with active dental decay the number of bacteria per cubic centimeter of saliva is high (20,000 or more), and in mouths in which the teeth are immune to decay at any specific time the counts are negative (under 100). Studies conducted by Jay (5) among representative population groups reveal that approximately 15 per cent of the individuals sampled have negative counts and about 57 per cent significantly high counts.

It has been established by Dean, *et al.* (4) that in areas in which fluorine occurs naturally in the drinking water supply there is a lower-than-expected incidence of dental decay among the group of the population studied (12- to 14-year-olds). In these fluoride areas, there is a much-greater-than-expected proportion of negative *Lactobacillus* counts (37.4 per cent) and a smaller-than-expected proportion of high counts (27.5 per cent) when the drinking water contains more than 1 ppm fluorine. The results of these *Lactobacillus* studies tend to confirm the dental findings.

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The purpose of this paper is to present a preliminary observation made in connection with the studies of *L. acidophilus* counts in the Newburgh-Kingston Fluorine Demonstration, now being conducted by the New York State Department of Health (1, 2).

In order to determine the efficacy of introducing fluorine artificially into a public water supply for the purpose of reducing the incidence of dental caries, 1 ppm fluorine as sodium fluoride has been incorporated into the Newburgh water supply continuously since May 1945. Kingston, a comparable city, is consuming fluorine-free water and is being used for control purposes.

In Newburgh, individual *Lactobacillus* counts were made on random samples of the school population in 1944 and again in 1946 and 1947. The Kingston school population was sampled in 1946 and 1947. The findings are depicted in Fig. 1.

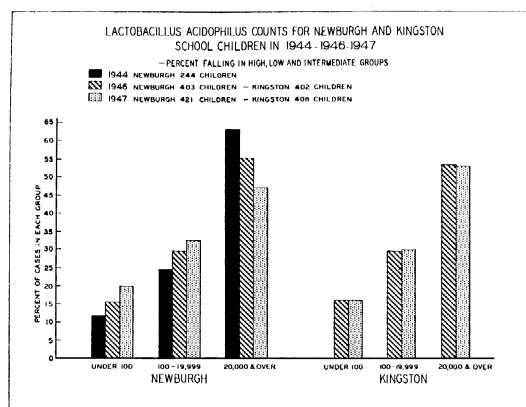


FIG. 1. *Lactobacillus acidophilus* counts for Newburgh and Kingston school children 1944-1946-1947—per cent falling in high, low, and intermediate groups.

Samples of saliva collected from 244 children of school age in Newburgh late in 1944 (prior to the introduction of fluorine into the municipal water supply), showed that 11.9 per cent were negative, and 63.5 per cent had counts of 20,000 or over. Analyses of salivas of 403 children in the same community early in 1946 revealed that there were 15.4 per cent negative counts and 55.2 per cent high counts. Of 421 samples collected early in 1947, 20 per cent had negative counts, while 47.3 per cent had high counts. In contrast, an analysis of the salivas of 402 children in Kingston early in 1946 revealed that 16.2 per cent had negative counts and 54.2 per cent, counts of 20,000 or over. In early 1947, among 408 children in Kingston, 16.2 per cent had negative counts and 53.9 per cent, counts of 20,000 or over.

It will be observed that while in Kingston the percentages of high and low counts remained approximately constant for the two-year period, there has been a consistent drop in percentages of high counts and a rise in the percentages of low counts in Newburgh since fluorination of the municipal water supply.

The standard significance tests were applied to the differences between the 1944 and the 1947 figures. The rise in the percentage of low counts (8.1 per cent) was 2.68 times its standard error, with a chance probability of .007. The drop in the percentage of high counts (16.2 per cent) was 4.03 times its standard error, with a chance probability of .00006. These differences may be considered statistically significant.

Although this is only a preliminary observation, it is in the direction which would be expected if artificial fluorination ultimately produces a decrease in dental caries.

Klein (6, 7) has recently shown, in higher fluorine concentrations, that a reduction in dental caries from fluorine can be a posteruptive phenomenon. Since all the children examined in Newburgh drank water containing fluorine after many of their teeth had already erupted, the *Lactobacillus* counts bear on the controversial question of the effect of fluorine after eruption of the teeth.

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A New Antibody in Serum of Patients With Acquired Hemolytic Anemia

PHILLIP STURGEON

Department of Pathology,
Childrens Hospital, Los Angeles

It has been possible to demonstrate an incomplete or "blocking" type of antibody in the sera from three patients (A. G., S. N., and L. H.) with acquired hemolytic anemia. None of these showed autoagglutination; one possibly showed auto-hemolysis. No significant titers of cold agglutinins were found. Donath-Landsteiner and Ham tests were negative. All had had splenectomy. One (S. N.) died; the other two have made some clinical and hematological improvement. Serum obtained prior to splenectomy was studied in one instance (A. G.).

TABLE 1
IDIOPATHIC ACQUIRED HEMOLYTIC ANEMIAS

Test	Patients		
	A. G.	L. H.	S. N.
Autoagglutination	—	—	—
Panagglutination	—	—	—
Autohemolysis	—	—	+
Direct developing test	++++	+++	++
Pos. indirect developing tests	12	7	3
No. of indirect developing tests performed*	12	7	3
Titer of free antibody	1/4,096	1/256	1/128

*Each test performed with type O cells from different individuals, both Rh— and Rh+.

Serum from rabbits immunized with human serum has been used to demonstrate the presence of the incomplete antibodies, both on the red cells and free in the sera of the patients. It has also been possible to trace the antibodies through several procedures which demonstrate some of their immunological properties. The testing (developing) serum prepared in a manner similar to that described by Coombs, Mourant, and Race, gave

a positive interphase precipitin test against human serum diluted 1/20,000 (2). A "direct developing test" is performed against thoroughly washed patient's cells. If the cells agglutinate on addition of the developing serum, the test is considered positive. The "indirect" test is performed in the same manner against appropriate normal cells which have first been incubated with the patient's serum. If agglutination occurs, it is presumed to constitute a demonstration of free antibody in the patient's serum (1, 3). A titration of the free antibody in the patient's serum can be made, using the indirect method, against cells sensitized in serial dilutions of that patient's serum. The actual developing test is done by the slide technique. Equal volumes of a 2 per cent sensitized cell suspension and the developing serum are mixed on a slide and allowed to stand for 5 minutes. Table 1 summarizes results common to all three patients. Table 2 lists comparable observations on control cases of hemolytic anemia.

TABLE 2
CONTROL HEMOLYTIC ANEMIAS

	Hereditary forms			Erythroblastosis fetalis	
	Cooley's (2 cases)	Familial jaundice (2 cases)	Sick-le-mia (1 case)	Patient (3 cases)	Mother (3 cases)
Auto- and panagglutination	—	—	—	++	—
Auto- and panhemolysis	—	—	—	—	—
Direct developing test	—	—	—	++	—
Titer of free antibody					
Rh+ cells				1/32	1/512
Rh— cells				0	0

Further studies have been carried out with serum from case A. G. The titer of antibody in the presplenectomy serum was found to be 1/512, this serum having been stored at 4°C. for 6 months. The postsplenectomy titer is 1/4,096 in fresh serum. It has been possible to test the thermolability and species specificity and to investigate the relative position of the receptor for this new type of incomplete antibody. A high-titer saline

TABLE 3
REACTION OF THE A. G. ANTIBODY WITH VARIOUS RECEPTORS

Receptor	Developing test
Type O cells	
Rh+	++
Rh—	++
Type B cells	++
" AB cells	++
" A cells	++
Rhesus cells	0*
Sheep cells	0†

* Developing serum first absorbed with "unsensitized" rhesus cells.

† Sheep cells sensitized with human heterophile antibody have been found to give a positive developing test.

eluate (1/512 at 56°C., 1/32 at 37°C.) of the antibody from A. G. was prepared by incubating patient's cells or sensitized normal cells in equal volumes of saline for ½ hour at 56° or 37°C. Table 3 lists the reactions of this eluate with various receptors as brought out by the developing test.

Other observations of the A. G. serum have shown that the antibody cannot be demonstrated by the developing test to have reacted with red cells stored in normal saline solution for