experiments, there was observed a positive correlation between the lengths and breadths of cysts of the 2 strains, as has been found in the cysts of *Giardia lamblia*,[2] and paralleled the findings of Hegner in regard to *Giardia agilis*[3] and *Trypanosoma diemyctyli*.[4]

5492

Incidence of Protozoan Infections of Intestinal Tract Among Children in Saint Louis.

H. TSUCHIYA. (Introduced by J. Bronfenbrenner.)

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This survey was undertaken to determine the relative incidence of the protozoan infections among white children under varying states of health and environment. The subjects were, therefore, taken from 3 distinct groups; the first consisted of 164 inmates of 2 orphanages, the second of 156 patients of 2 hospitals for convalescents and the third of 42 children suffering from variety of acute illnesses. The total was 362 children.

A comparative study of the incidence of protozoan infection as affected by the general state of health showed no significant differences among these groups. In general, the incidence of infection was found to be lowest in the third group (sick children) and the highest among the healthy children in one of the orphanages. This result seems to indicate that environmental conditions play important rôle in the transmission of protozoan infections.

Of the 362 children examined, in 120 cases (33.09%) the infection was limited to one protozoan species; in 37 cases (10.22%) a double infection was found; and in 11 cases (3.02%) there was a triple infection. The incidence of *Giardia lamblia* was the highest, other protozoa following in order of frequency *Endamoeba coli, Chilomastix mesnili, Endolimax nana, Endamoeba histolytica, Iodamoeba williamsi* and *Trichomonas hominis*. In the majority of mixed infections, *Giardia lamblia* was associated with either one or 2 other protozoa. As compared with the surveys conducted elsewhere, the present study revealed one of the highest incidences reported.

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[2] Tsuchiya, H., *Am. J. Hyg.*, 1931, **13**, 544.

[3] Hegner, R. W., *Am. J. Hyg.*, 1922, **2**, 435.

[4] Hegner, R. W., *J. Parasitol.*, 1921, **8**, 105.

The age of children ranged from 1 to 16 years. The highest incidence was found among children between 7 to 9 years old, and the lowest between 1 and 3. The incidence of the infections was much higher among boys than among girls.

Judging from this study, we are inclined to believe that, irrespective of the general state of health of individuals, they may become carriers, if sufficiently exposed to an infection by ingestion of cysts or trophozoites with food or drink. As a matter of fact, among the healthy children in one of the orphanages where the personal hygiene was not sufficiently stressed, the incidence was higher than among sick children temporarily confined in the hospital. On the other hand, in the other orphanage where a rigid hygiene was enforced upon children, there was a very low incidence.

5493

Variations in Optimum pH for Oxidation by Yeast of Substrates, Glucose, Pyruvic Acid and Lactic Acid.

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The rate of oxygen uptake by yeast in buffer solutions containing the metabolites, glucose, lactate (r.) or pyruvate, is markedly influenced by the buffer pH. The curves of the accompanying figure show average results for 120 minute periods with the 3 substrates at different pH levels. Washed Fleischman yeast, in phosphate, phthalate or citrate buffers of 0.15 M was used with the Warburg manometric apparatus (Temp. 37.5°), the CO_2 being absorbed by NaOH. The pH of the buffer solutions was determined by the quinhydrone electrode, and that of yeast mixtures, colorimetrically.

With glucose as a substrate the maximum of oxygen uptake occurs in buffers having initial pH values from 4.5 to 6.0. With lactate and pyruvate the maximum lies at a pH between 4.0 and 4.5. On the acid side of the optimum, since the oxidation of all 3 substrates is depressed to a similar degree, the glucose curve may be taken as representing the effect of pH on the ability of yeast to oxidize these substances. On the alkaline side of the optimum, the curves of lactic and pyruvic acid fall off more rapidly than that of glucose. The maximum rate of glucose oxidation extends over a