pathognomonic for experimental food poisoning in white mice. In the experience of the writers deaths occurring later than 48 hours after feeding are probably due to other causes than the paratyphoid poison which acts primarily on the duodenum and stomach but may extend its reaction down the intestines beyond the duodenum. Rabbits, guinea pigs and cats fed double lethal mouse doses by weight of the poison may present transitory and indefinite symptoms from which they rapidly recover. Their blood collected 2 weeks after the feeding of the poison usually agglutinates the paratyphoid bacilli in low dilutions.

Symptoms of food poisoning have been produced in a macacus monkey by feeding 10 cc. of a potent poison and its blood had an agglutination titre of 1/640 2 weeks later.

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Electrolytes of Saliva Under Normal and Pathological Conditions.

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The growing perception of the close relations of saliva to the teeth and the surrounding tissues led to systematic analyses of the mixed saliva in order to obtain normal or standard values for the electrolytes and thus a foundation for the study of this secretion under pathological conditions. The examinations of the physiological resting saliva were made on persons with absolutely intact teeth and normal gum tissues, and, who were known not to have been sick within the last 3 or 4 years. In all cases the saliva has been analyzed as to its content of cations and anions, namely Cations: K, Ca, Mg, Na; Anions: Cl, P, (*i. e.*, PO_4), CNS, as well as the H-ion concentration (pH). The CO_2 capacity and viscosity.

1. It was found that under physiological conditions the excretion of cations and anions diminishes, with the exception of potassium (between 20 and 40 years) but noticeably increases with an advance in age.

2. By an arithmetical average for the different saliva components the following normal standard values have been determined:

HCO_3=93.16 mg.% (Determination according to van Slyke).
pH= 7.15 (Determination with the Quinhydronelectrode).
K=55.89 mg.% (Determination according to Kramer Tisdall).
Ca=12.13 mg.% (Determination according to Kramer Tisdall).
Mg= 1.29 mg.% (Determination according to Kramer Tisdall and Tschopp).
Cl=74.68 mg.% (Determination according to Tschopp or Bang).
PO_4=13.16 mg.% (Determination according to Tschopp or Bell and Doisy).
CNS=30.9 mg.% (Colorimetric method).

3. Electrolyte composition of the saliva during one day:

a. Potassium and Sulfocyanide show the lowest values in the morning before breakfast, and then increase slowly, having the highest percentage in the afternoon; overnight the values diminish until the lowest point is again reached.

b. Calcium and Chloride contents vary in opposite directions to the potassium and sulfocyanide, being highest in the morning and overnight. During the day they remain nearly constant.

c. In comparison to the other cations the amount of magnesium is very small, showing the lowest values before breakfast in the morning. About noon it reaches the highest point and then gradually decreases. It seems that the magnesium is found inversely proportional to sodium; about its properties and functions in the body however little is known.

d. Phosphorus (PO_4), HCO_3 and pH are least constant; no constant values could be found as for the electrolytes mentioned under a-c.

4. The H-Ion concentration of the saliva collected from the parotid differs fundamentally from the mixed saliva of the same individual. In fact, the parotid saliva is primarily acid, while the secretion of the sublingual and submaxillary glands falls into the alkaline range.

5. A Calcium compound which is negatively charged and readily absorbed by positively charged absorbents is present in the saliva. The compound is probably the main factor in the formation of tartar.

6. Through a special mode of experimentation it is now proven that the saliva is not a saturated solution of $CaCO_3$ and $Ca_3(PO_4)_2$.

7. In the majority of the tooth pastes now available on the market readily soluble Ca salts have been demonstrated. These salts increase temporarily at least the Ca content of the saliva and lead to retention and depositions in the interdental spaces. Other substances of the pastes exert an absorbing action on the negatively

tion in media which regularly yielded spores of an enhanced resistance were not successful. Attempts to produce spores in any appreciable quantity in synthetic media prepared from highly purified chemicals met with failure.

Evidence gleaned from the literature and accumulated during the progress of this work supports the idea that the cause of death in cells exposed to a high temperature is the coagulation of bacterial protein. Conditions which render protein more difficult to coagulate consequently result in an increased resistance to heat. The water and the ash content of the cell appear to be especially important in this connection. However, cultivation under certain nutritive conditions which do not appear to be intimately related to either the water or ash of the cell has invariably resulted in the production of resistant spores.

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An Endeavor to Adapt a Trypsin Susceptible Bacteriophage to the Action of Trypsin.

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It is well known to students of the d'Herelle phenomenon that bacteriophages, with rare exceptions, resist the action of trypsin for indefinite periods of time. Recently, one of us[1] described the trypsin susceptibility of 2 races of staphylococcus bacteriophages; one a monovalent, the other a polyvalent race. These 2 races were found to be highly susceptible to the action of trypsin, complete inactivation following an exposure to this enzyme within 48 hours at incubator temperature. In view of the difference of opinion entertained by various investigators on the question of whether bacteriophages actually possess powers of adaptation, a property indicative of life, it occurred to us that this susceptibility to tryptic activity might possibly serve as a basis for determining further the capacity of bacteriophages to adapt themselves to deleterious or inhibiting agents.

Two methods of arriving at an answer were employed. In one series of experiments, the bacteriophage was exposed to the action

[1] Schultz, E. W., PROC. SOC. EXP. BIOL. AND MED., 1928, XXV, 280.