

The results of my work have shown that no two seeds are alike in their protein constituents, and that those proteins which appear to be alike are found only in seeds that are botanically closely related.

As I have elsewhere pointed out, it would seem that these differences in the reserve food substances of the endosperm must have an important bearing on the character of the developing embryo which derives its first food from them.

This food substance, and the embryo as well, are the final products of the series of chemical changes which led to their formation. When the embryo begins its development it finds at hand a definite food; which for each individual of the same species is the same, but for the individuals of different species is different. Each member of a species begins its independent life under similar chemical conditions, but under chemical conditions which are different from those of every other species.

When, therefore, each individual plant reaches that stage of development at which its organs of assimilation are able to furnish it with nutriment from its external surroundings, it is highly probable that its chemical processes have already been established along definite lines which it must follow throughout the rest of its life.

63 (319)

Variation in hydrochloric acid secretion during the digestive period.

NELLIS B. FOSTER and **ADRIAN V. S. LAMBERT.**

[From the Laboratory of Biological Chemistry of Columbia University, at the College of Physicians and Surgeons.]

These observations were conducted on dogs having Pawlow double stomachs. After test meals of hashed meat, alone or mixed with crackers and water, it was noted that the percentage of HCl in the gastric secretion varied somewhat during the digestive period. Estimations of the HCl were repeatedly made for each hour during the period, by the Volhard method of chlorine determination, after neutralization of the juice with NaOH and careful incineration. The total chlorides and the metallic chlorides were determined, and the difference between them reckoned as HCl. By

the use of this method it became evident that the gastric secretion was higher in its content of HCl early in digestion than it was toward the end and that there was a general lowering of the acid percentage as digestion progressed, in the same way that there was a lessening in the amount of juice secreted. The amount of HCl in gastric juice in the first two hours of digestion was from 0.4 to 0.5 per cent., whereas in the last hour it sometimes fell to 0.2 per cent. or slightly lower.

The acidity of the juice and to some extent the variation in secretion varies with different dogs and with different diets, but with any one animal the response elicited by a certain test meal is remarkably constant, and the curves of acid secretion, like the curves for the amounts of juice secreted, are uniform.

64 (320)

The effects of some organic acids on the secretion of gastric juice.

NELLIS B. FOSTER and **ADRIAN V. S. LAMBERT.**

[From the Laboratory of Biological Chemistry of Columbia University, at the College of Physicians and Surgeons.]

The acids used in these experiments were given in food to dogs with Pawlow double stomachs. The following acids were employed in concentrations of 0.5 per cent. and 0.2 per cent. in all experiments: lactic, butyric, citric, acetic. Lemon juice (7 per cent. citric) and vinegar (4.8 per cent. acetic) were also used. In no case, with the possible exception of vinegar, could a stimulating action on the gastric glands be attributed to the acid liquids administered. The juice secreted, in amount and acid content, was uniform with the controls. In some cases vinegar appeared to excite a more copious secretion of juice but this result was not constant. The distillate from neutralized vinegar acted in the same way as vinegar, while acetic acid alone appeared to be inert. From this it may be inferred that if vinegar has any effect upon digestion, it is due to the volatile substances which it contains and not to the acetic acid.