afforded by these non-specific cestode materials, following their injection as suspensions of powdered worm.

On the other hand, introduction into the peritoneal cavity of rats of whole, or long pieces of, living *Taenia pisiformis* resulted in a high degree of protection against infection by the larvae of *T. taeniaeformis*, as was shown by infecting the rats some weeks after the operations (Exp. 2). The control animals into whose body cavities the cysticercus stage of *taeniaeformis* had been placed contained no living cysts at autopsy, while the untreated controls were heavily infected.

On one earlier occasion the mistake had been made, in one experiment, of feeding onchospheres of *T. pisiformis* instead of *T. taeniaeformis*. When these rats were subsequently fed onchospheres of the proper species it was found that the control (untreated) animals were refractory to infection, although control rats of other experiments to which portions of the same lot of onchospheres had been fed became heavily infected. To test the hypothesis that feeding with eggs of one species would confer protection against infection with those of another, in this case, closely related, species, rats of one group (Exp. 3) were fed once with 1500 *pisiformis* onchospheres, and those of a second group were fed again, 3 weeks later, with approximately 9000 onchospheres each. These anmials, together with brother and sister (untreated) controls, were fed *taeniaeformis* onchospheres several weeks later. The autopsy data are shown in the table.

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Studies on Blood Diastase.

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Diastase is known to be a normal constituent of human blood, but available information as to its quantity is inconsistent. The variety of measuring units and the multiplicity of methods render it impossible to correlate results and to explain conflicting conclusions. Even one and the same technique yields different results in the hands of different workers. One factor responsible for this situation is the use of soluble starch as substrate in measuring the enzyme action. It is practically impossible to prepare 2 identical

batches of soluble starch, and consequently each will give different results with the same quantities of the enzyme, the discrepancies frequently being quite considerable. Moreover, investigators in general fail to consider the intricacies of the kinetics of diastase action and carry out their determinations under conditions where the amount of reaction products determined is not in linear proportion to the amount of enzyme.

A study of substrates convinced us that starch pastes prepared from various refined natural starches by boiling at atmospheric pressure furnish adequate substrates. Pastes of 0.5 to 2% concentration, prepared from well washed rice, corn, wheat, potato or arrowroot starches, yield identical amounts of reducing sugars if incubated with identical amounts of enzyme under standardized conditions. It is remarkable that with glycogen the same results are obtained as with starch pastes. In another approach to the quantitative determination of diastase, in the measurement of the rate of cleavage of starch to the point where it no longer gives blue color with iodine, all starch pastes studied yield reproducible results, while every batch of soluble starch differs from the other. Thus the use of starch paste as substrate eliminates one variable in the study of diastatic activity. The next step was to determine and standardize the conditions which insure a direct proportionality between the amount of enzyme and that of reaction products. This is feasible by proper adjustment of the relative concentrations of enzyme and substrate.

The 2 phases of enzyme action, the amyloclastic and the saccharifying, exhibit a fair parallelism so that both are equally useful as the basis of quantitative methods. The technique involving the determination of the sugars, however, is more accurate, as the judgment of color changes in the starch-iodine reaction is more or less subjective. To diminish the influence of the subjective factor, we have applied the observation of the transparency of the reaction mixture as an additional criterion in establishing the rather arbitrary end point.

In the examination of numerous blood samples obtained from healthy humans, we find that the bulk of the diastase is in the plasma, the corpuscles containing less than one-fifth of the total. The normal diastase content of human blood plasma exhibits variations of 100%, while in toxemic conditions it is in general greatly diminished.

Cleavage products of starch under the effect of blood diastase were also studied. Contrary to statements in the literature, we find

but very small quantities of glucose and maltose. The bulk of the reducing sugars produced by blood diastase is a non-fermentable substance which we were able to isolate in crystalline form. It possesses approximately one-third of the reducing power of glucose, and preliminary examination indicates that it is a trisaccharide (Lohmann, Barbour). By alcoholic fractionation another crystalline polysaccharide was separated which does not reduce copper, gives no color reaction with iodine and is probably identical with Pringsheim's "graenzdextrine," a tetra- or hexa-hexosan. Further analysis of the 2 substances is in progress. The generally assumed presence of the enzyme maltase in blood found no substantiation in our experiments.

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Effects of Anterior Pituitary from Various Species on Sex and Thyroid of Immature Guinea Pigs.*

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We have shown that different preparations of the anterior pituitary gland of different species, as well as urine of pregnant women, exert on the sex organs of immature guinea pigs varying effects. The differences were not equally marked in all cases; they were quite definite in the following 3 groups: (a) various preparations of anterior pituitary of cattle; (b) urine of pregnant women, and (c) anterior pituitary of guinea pig, rabbit and cat. Within the latter group (c) the differences between cat and rabbit were of a quantitative character, rabbit anterior pituitary showing somewhat greater effects than cat anterior pituitary; otherwise they were essentially the same. The effects of anterior pituitary of guinea pig differed from those of anterior pituitary of rabbit and cat, in that in the former the development of large mature follicles was very prominent, while the production of pseudolutein bodies and interstitial gland was relatively insignificant in contrast to the latter, in which the pseudoluteinizing effects were much more marked. Our attempts to make the effects of the anterior pituitaries of rabbit and guinea pig identical by varying the quantities of both, were not quite successful.

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