For the gas exchange both kinds of changes differ vastly; the large increase of the oxidation, up till now regarded as the expression of the physiological excitation of the nervous system, is only an artificial product of the electrical stimulation. This must not refer to all chemical processes. Some years ago I found with my collaborators that the isolated central nervous system of the frog consumes sugar from the surrounding solution and that this consumption of sugar, especially of glucose, is very much increased by electrical stimulation. Now I performed a new series of experiments, where the sugar consumption was compared when the spinal cord was directly stimulated and when it was stimulated by way of reflex through the sciatic nerves. In contrast to the observations on the gas exchange the result was quite the same in both cases, as well in the normal, as in the strychninized organ. Therefore the increase of sugar consumption is no artificial product of stimulation, but a process really conditioned by the physiological excitation. As the sugar consumption produced by way of reflex is accompanied by only a small increase of oxygen intake, we must conclude that the main part of the sugar does not disappear through oxidation.

I can not close without thanking once again Dr. Jacobs for the extraordinary hospitality shown to me at the Marine Biological Laboratory in Woods Hole.

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THE OCCURRENCE OF A PELLAGROUS-LIKE SYNDROME IN CHICKS

A PELLAGROUS-LIKE syndrome in chicks has recently been obtained at this laboratory in an experiment which was originally designed to throw added light upon an unusual type of leg paralysis occasionally encountered in chicks fed semi-synthetic rations.

The external manifestations of this nutritional disease appear chiefly at the eyes, at the mouth corners and upon the feet. The edges of the eyelids become granular and contract so that vision is restricted. Later, a viscous exudate is produced which causes the eyelids to stick firmly together.

Crusty scabs appear at the corners of the mouth. These gradually enlarge and may even spread so as to involve the margins of the skin around the nostrils and underneath the lower mandible. The skin upon the bottoms of the feet and between the toes peels off. Afterwards, small cracks and fissures appear at these points. These enlarge and deepen so that chicks affected are sensitive to walking.

Feathering is retarded, and the few feathers produced are rough and staring. There is, however, no loss of down or feathers comparable to the loss of hair obtained in pellagra in rats.

Post-mortem examination of chicks that die almost invariably shows the presence of a pus-like substance in the mouth and of a grayish-white exudate in the stomach. The entire intestinal tract is almost entirely devoid of undigested food residues. The small intestines lack tonicity and appear atropic.

The liver is found frequently to vary in color from a faint yellow to a deep dirty yellow, and occasionally it may show hypertrophy. The kidneys reveal a tendency to enlargement and appear grayish-white or inflamed and hemorrhagic.

This syndrome first appeared in a group of White Leghorn chicks when about three weeks of age which were fed a normal diet except for the use of Merck's powdered egg albumin in place of the more common protein of animal origin. At six weeks of age the few chicks remaining averaged 128.4 grams in weight and the mortality was 72 per cent.

The substitution of purified casein for the egg albumin in the basal ration delayed the onset of the pellagrous-like symptoms but gave no improvement in growth. Granulation of the eyelids and encrustation of the mouth corners were less severe in this group, but most of the chicks developed feet conditions just as bad as those in the egg-albumin group. The average weight of these chicks at six weeks was 119.0 grams and the mortality was 36 per cent.

The addition of 2.5 per cent. of autoclaved yeast to the purified-casein basal diet improved growth, prevented granulation of the eyelids and encrustation of the mouth corners but did not prevent entirely the occurrence of scaly, cracked feet. Five per cent. of autoclaved yeast completely prevented all these conditions and produced still better growth. The best growth, however, was obtained by the addition of 10 per cent. of autoclaved yeast to the purified-casein basal diet. At six weeks, the average weight of the chicks in this group was 420.6 grams, a weight 33.4 per cent. greater than the normal average weight for White Leghorn chicks six weeks old used at this laboratory. No mortality was obtained in this group or any of the other groups which had received autoclaved yeast.

The data obtained in this experiment demonstrate the intense requirement of another species for the vitamin or vitamins present in autoclaved yeast, commonly called vitamin B_2, vitamin G or the P–P factor, and indicate that the chick may be a more suitable animal than the white rat for determining the quantity of this vitamin present in food-stuffs.

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