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Artificial cyclopia in the smelt.By **J. F. McCLENDON.**

I found that about about 0.1 per cent. of the smelt embryos in the fish hatchery at Cold Spring Harbor, L. I., had abnormal eyes. There were all degrees of approximation and "fusion" of the two eyes, sometimes resulting in perfect cyclopia. Less often one eye was imperfectly developed or absent (monophthalmia asymmetrica).

Preliminary experiments show that the percentage of abnormal eyes was increased by the addition of anaesthetics or magnesium chloride to the water, or by inhibiting the gaseous exchange.

It was thought improbable that much of the magnesium entered the embryos. If sub-lethal percentages of neutral salts are added to the water in which adult fish live, very little salt enters their bodies. As the lethal dose is approached, asphyxiation commences and salt enters the fish in larger amounts.

It was not practicable with the material at hand to make accurate chemical analyses of the embryos, but microchemical tests showed no more chlorides in the embryos developed in M/5 $MgCl_2$ than in those developed in tap water. One demonstration that salts enter fish embryos is that in pure potassium chloride solutions the heart stops beating. No increased amount of potassium was found by microchemical tests, in embryos kept in M/5 KCl until the heart stopped beating, than in the controls.

If the magnesium does not enter the embryos it must act on the surface, and since its effect is similar to that of deficient aeration, I suggest that the magnesium alters the surface so as to retard the entrance of oxygen or the exit of carbon dioxide. Anaesthetics that are known to penetrate freely may nevertheless produce their characteristic effect by altering the surface.

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Cataphoresis of proteids in the living cell.By **J. F. McCLENDON.**

In cells of the newt, the frog, the onion and the hyacinth, on the passage of an electric current, the basic-staining proteids move toward the anode and the acid-staining toward the cathode.

These substances do not pass through the cell or nuclear membranes, but the nuclear membrane is often pushed out toward the anode by the pressure of the (basic-staining) chromatin.

During the process of mitosis, however, the above rules do not hold. As the process of mitosis advances, more current is required to move the chromatin, and more acid-staining proteid is carried along with it. After the mitotic spindle is formed, it (including the chromosomes) is carried toward the anode without alternation of its axial orientation.

These facts disprove the hypothesis that the chromosomes are drawn to the poles of the spindle by electrostatic stress, the poles and chromosomes being of opposite sign, for if this were true, the poles of the spindle would not move toward the anode with the chromosomes, but would move toward the cathode.

It is probable that the mitotic spindle consists chiefly of proteids in the "gel" phase, and that this gelation prevents the separation of acidophile and basophile substances by the current. That the cells were not killed and the spindles coagulated, during the experiments, is demonstrated by the fact that a cell in which the spindle was displaced by the current divided. In this case the cytoplasm was divided unequally, as the division passed through the equator of the displaced spindle.

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Nitrogen and sulphur metabolism in morbus ceruleus.

By **N. B. FOSTER.**

In morbus ceruleus due to congenital cardiac defect there are found two conditions which suggest that in this disease the tissues are not so adequately furnished with oxygen as in health. These conditions are the abnormally high carbon dioxide content of the venous blood (Lepine) and the erythrocytosis, the latter being a direct response of the hemopoietic tissues to a lowered oxygen tension (Seller). It would seem plausible that in some severe cases the metabolism might be altered by the conditions mentioned. The case observed in this study was a child that presented all the features of morbus ceruleus due to congenital cardiac defect. Analyses of the urine failed to show anything abnormal in the nitrogen partition. The comparison of the amounts of