

PHYSIOLOGY

Transplanted Eyes In Salamanders Regain Sight

Thus Far, However, Transplants of Mammalian Eyes Have Been Unsuccessful; Opossum Is Being Studied

EYES of various kinds of animals have been successfully transplanted, with return of vision, in experiments reported in a lecture by Prof. L. S. Stone of Yale University School of Medicine. Most of the work, Prof. Stone said, has been with salamanders, long-bodied relatives of frogs and toads. The transplants were made at all ages, from embryo to adult.

While the transplanted eyeballs grew into place successfully, the regaining of vision was a somewhat roundabout process. The severed ends of the optic nerve did not unite. Instead, there was a new growth of both nerve and retina, and vision was restored when this process was completed, after about two months. The same eye, Prof. Stone stated, has been repeatedly grafted, with return of vision each time. He has even exchanged eyes between salamanders of different species.

Thus far, experiments with mammalian eye transplants have not been successful at the Yale laboratory. When rats' eyes were transplanted, they degenerated and were resorbed into the animals' bodies, the process taking about four months. Resorption also occurred in fish with transplanted eyes.

"At the present time the opossum is being studied as the most promising mammal for eye transplantation," Prof. Stone continued. "At birth the young are quite embryonic. The eye is so primitive at this time that it is in the same stage of development as a five-weeks-old human embryo. This condition lends itself to an experimental analysis in a way that is not possible in any other mammal."

In operations on the eyes of embryo salamanders, Prof. Stone learned some new facts about the factors influencing normal eye development. The experiments showed that the formation of the lens was dependent on the action of the optic centers growing from the primitive nervous system, and that the lens could be primarily governed by an early interference with the factors underlying the primitive nervous system.

"So far as we know," he said, "all vertebrate eyes, with the exception of a small group of salamanders, have no power of restoring a lost lens. . . . The common vermilion-spotted newt is an example of the rare group which has the ability to replace the completely excised lens by a growth of cells from the pupillary margin of the dorsal rim of the iris."

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CHEMISTRY-BIOLOGY

Heavy Carbon Atom "Tags" Obtained by Easy Method

"TAGS" for atoms made of heavy carbon, used to follow biological processes in plants and animals, may be obtained with a piece of equipment that "could be operated in the corner of any biochemical laboratory, serviced by an assistant in a small fraction of his working time," declares Dr. William W. Watson, of the Sloane Physics Laboratory of Yale University (*Science*, May 16).

Ordinary carbon consists of atoms of weight 12, to the extent of 99.3%, the remaining 0.7% being atoms of weight 13. By the thermal diffusion method, in which a heated wire makes heavy atoms move down and light ones up, the concentration can be altered, and this is the

system that Dr. Watson used. The carbon with a higher percentage of heavy atoms behaves in bodily processes just like the ordinary kind, but since it can be identified, it is possible to trace the course of this element.

Dr. Watson made the separation in methane gas, which consists of carbon and hydrogen. To obtain one gram (1/28 ounce) of heavy carbon in the form of methane in which it is present to the extent of 20%, the equipment would use, over 140 days, about 22,000 kilowatt hours of electricity. This would cost around \$300. However, he states, biochemists use only amounts of a few thousandths of a gram for their experiments, and the concentration does not always need to be as high as 20%. Thus he favors this method for general use over another, that of chemical exchange, which has about 20 times the production rate, but is more complicated and uses hydrocyanic acid gas, a deadly poison.

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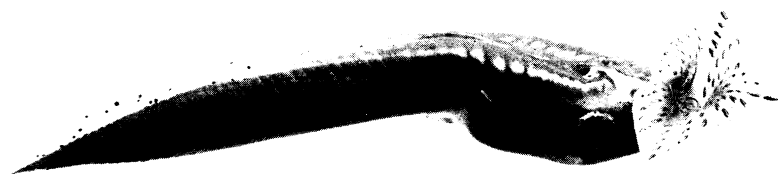
ZOOLOGY

Tadpoles Subject of Exhibit at Field Museum

THE humble tadpole has his innings in a new exhibit just opened at the Field Museum of Natural History in Chicago. It consists of enlarged models of tadpoles of various species, made of accurately colored plastics by Preparator Frank H. Letl, under the direction of Clifford H. Pope, curator of amphibians and reptiles. Included in the exhibit are not only the familiar forms, but also strange species from foreign lands.

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A good deal of mountain country in *Palestine*, once thought unfit for agriculture, is now terraced and extensively planted with fruit trees.



ODDITY

This enlarged model of a Chinese tadpole with expansible mouth may be seen at the Field Museum of Natural History. The unusual mouth is used for surface breathing and for aid in feeding. At rest the folded lips curl upward like points of a crescent moon.