

BIOLOGY

Organs Kept Alive in Tubes To Throw Light on Life

Apparatus for Circulating Synthetic Blood Through Rabbit's Kidney Shows Complicated Cell Respiration

ORGANS removed from the body and kept alive by artificial means are giving Brown University scientists a clue to the secret of how life goes on. Details of the studies which have already led to a new theory of the life-essential process of cell oxidation were reported by Prof. J. Walter Wilson of the department of biology.

Instead of watching the functions of the artificially-living organ as a whole, Prof. Wilson is probing life's secrets by studying under the microscope the activities of the tiny cells which make up the organ.

Heating the organ, a rabbit's kidney in this case, Prof. Wilson noted that the breathing rate of these tiny cells mounted as the temperature rose. At the "coma point" he saw minute liquid-crystal rods within the cells shatter. When poisonous cyanide was added to the synthetic blood stream passing through the artificially-living kidney, these minute rods, called mitochondria, broke up into bits as the kidney died of the poison.

From these and similar experiments, Prof. Wilson concludes that the vital breathing of the kidney cells is governed

by tiny parts within the cells and not by the cell as a unit. He believes the mitochondria play a part in some types of cell breathing, or oxidation as it is called scientifically. He also thinks that other parts of the cell, particularly the nucleus, are involved in cell breathing.

"Cell respiration apparently is not a single simple process," he declared, indicating that further tests would be made to verify the new theory.

For his experiments he uses a perfusion apparatus, developed after eight years of research, which circulates synthetic blood through rabbit kidneys. The "blood" is made to flow by mechanical heart-beats under normal temperature and pressure. By controlling the chemistry of the synthetic blood, which consists of a simple salt solution, red corpuscles from beef blood and oxygen, Prof. Wilson is able to control the rate of oxidation or breathing of the kidney cells.

Prof. Wilson said recently that the delicate mechanism of the kidney, although ideal for his experiments in most ways, is difficult to keep alive more than 15 minutes artificially. This made it necessary to conduct scores of individual tests to arrive at conclusive results. It takes a week to prepare Prof. Wilson's apparatus for a single experiment.

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KEEPS ORGANS ALIVE

This complicated apparatus, which took eight years to perfect, keeps a rabbit's kidney alive outside the body. Synthetic blood is kept circulating through the organ, while Prof. J. Walter Wilson, Brown University, (right) investigates the breathing process of the minute cells that make up the organ. Working with Prof. Wilson is Victor M. Emmel, graduate assistant.

RADIO-ASTRONOMY

Listen For Shortwave Radio Signals From Milky Way

BECAUSE there is a doubt about the theory that short radio waves reach the earth from stars in the Milky Way, two California Institute of Technology scientists have erected delicate apparatus in the center of a ten-acre farm to study the origin of the mysterious radiation.

The research, being conducted by Dr. G. W. Potapenko and D. F. Folland, follows studies made by Dr. Karl G. Jansky of the Bell Telephone Laboratories on static. No signals as yet have been received.

In his experiments, conducted in New Jersey, Dr. Jansky observed three kinds of static, the third of which he speculated originated in the stars in the Milky Way, or reached the earth as the result of secondary radiation.

Mr. Folland expressed the opinion that it is probable the short waves, found by Dr. Jansky to be 14.6 meters in length, do not originate in the stars, but come from some other place.

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