

BIOCHEMISTRY

Enzyme Action in Cancer

► A FURTHER sign that in human cancers there is a fundamental disturbance in enzyme action within the cell has been discovered in studies by Drs. Henry M. Lemon and Charles L. Wisseman, Jr., at Massachusetts Memorial Hospitals and Boston University School of Medicine.

Enzyme chemicals are usually proteins and are responsible for important chemical transformations in living tissues. Pepsin in stomach juice which breaks down food proteins is a familiar example of an enzyme. The one studied by Drs. Lemon and Wisseman is called acid phosphatase.

There is greater activity of this enzyme in cancer cells than in normal cells of the

same kind of tissue or organ, they report in the journal, *SCIENCE* (March 4).

They believe this is the first time this increase in tissue acid phosphatase activity has been reported in human cancers. They suggest this increased activity of the enzyme may be related to the rapidity with which cancerous tissue takes up and holds tagged phosphorus.

The simple technics for studying the enzyme activity which they report may, they state, help in a more intensive investigation of the quantitative chemical changes within cells which are involved in the transformation of normal tissues to cancers in humans.

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AERONAUTICS-ENGINEERING

Liquid Oxygen for Pilots

► OXYGEN in liquid form, instead of as a gas highly compressed in containers, may soon be in use in airplanes flying at high altitudes for pilots, crews and passengers. The advantage is a saving in space and weight, as well as increased safety for flyers.

A new oxygen converter system, now under test at the Wright-Patterson base of the U. S. Air Force in Dayton, O., permits the use of the liquid form of oxygen. Also developed is a mobile oxygen liquefaction plant that can be contained in one trailer-truck. The trailer can be parked on the corner of a flying field, and with a storage tank, will fill the needs of the planes.

The converter consists of a metal container for the liquid oxygen, with a vaporizing coil and the necessary safety valves and specially designed operating valves. The oxygen, upon vaporization, is forced through the distribution system by the pressure formed by the change from a liquid to a gas. This converter is now being tested in a B-17.

The gaseous type of oxygen supply units for the B-17 weigh about 400 pounds when fully charged. The liquid type weighs only 130 pounds. It also saves 80% in space. One cubic foot of liquid oxygen will provide approximately 800 cubic feet of gaseous oxygen upon evaporation.

Although experiments in the use of liquid oxygen for supplying breathing oxygen have been carried on for years by several nations, no satisfactory method of storing and handling the liquid in planes had been found until now. The high pressure that builds up inside a closed tank of liquid oxygen, due to evaporation, precludes the use of tightly closed bottles or tanks. This required the development of methods that would permit controlled evaporation.

Insulation of the small units installed on planes was easily solved by applying the laboratory method of preserving the necessarily low temperature of minus 297 degrees Fahrenheit. It is by the use of vacuum-walled containers. A one-cubic-foot vacuum container holds enough liquid oxygen for the crew of a B-17, an amount comparable with that supplied by the present gaseous system.

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AERONAUTICS

Canada Has Produced Her Second Jet Engine

► CANADA now has its second home-developed and home-produced jet engine for airplanes, it was revealed by the Minister of National Defense in Ottawa. Running tests are being made and the engine is said to perform satisfactorily.

The new engine, known as the Orenda, is the largest known to have a comparable stage of development in North America.

It is the axial-flow type, which allows great power to be contained within a slender design. It is being groomed as a possible power unit for a new long-range jet fighter being developed for the Royal Canadian Air Force. Both engine and plane are being produced by A. V. Roe and Company, Toronto.

This larger Orenda engine follows the successful testing of the design and engineering of a smaller jet unit known as the Chinook, which was first tested about a year ago. The Chinook and the Orenda are the first gas-turbine engines ever produced in Canada.

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ENGINEERING

Mercury Vapor Is Used in New Turbine-Generator

► MERCURY vapor instead of steam is used to drive a turbine installed in Hartford, Conn. by the Hartford Electric Light Company, it was revealed. It is said to be the first commercial installation of a mercury turbine-generator.

The installation includes a mercury boiler in which this liquid metal, sometimes called quicksilver, is heated into vapor, just as water is heated into steam. The mercury vapor not only will turn the turbine which in turn drives the electric generator, but also will supply extra heat, which will be used to produce steam for other turbine-generators.

The mercury vapor turbine-generator was built by General Electric. Others are under construction for installations in various parts of the country, GE engineers state. This installation is capable of producing 15,000 kilowatts of electricity and also 200,000 pounds of steam at a pressure of 400 pounds per square inch.

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Science Service Radio

► LISTEN in to a discussion on "Drugs of the Future" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, March 19. Dr. Theodore Klumpp, president of Winthrop-Stearns, Inc. and speaking as president of the American Pharmaceutical Association, will be the guest of Watson Davis, director of Science Service. Dr. Klumpp will predict what kinds of drugs are needed in the future and perhaps do a brief and overall summary of the great advances in therapeutic drugs that have been made in recent years. He will also discuss the use of older people in industry, for he believes not only must we have the drugs to be used by physicians in keeping people healthy, but we must do something in this world to utilize the abilities and the real value in our civilization of the older people.

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