MEDICINE

# Cancer Kills More Quickly As Blood Alkalinity Rises

## Blood Condition May Enable Physicians to Predict Success Of Treatment and Course of Disease

STUDIES of far-reaching significance which may lead to the solution of the cancer problem have just been reported by Dr. Ellice McDonald, director of cancer research at the University of Pennsylvania Graduate School of Medicine, Philadelphia, and his associates, Gladys E. Woodward, Janetta W. Schoonover, Edith G. Fry and Edward G. Torrance.

The blood of patients with untreated cancer is more alkaline than normal, they found. This increased alkalinity seems to be related to the speed with which the disease will kill the patient.

"The greater the alkalinity, the quicker the disease kills," said Dr. McDonald.

Treatment by X-rays or radium, which may cure or at least retard the disease, affects the alkalinity of the blood.

These observations, reported in the forthcoming issue of the *Journal of Laboratory and Clinical Medicine*, indicate that in the condition of the blood may be found a means of predicting the course of the disease and the success of treatment. Likewise a new method of treatment may be developed which would turn out to be the long-sought specific cure for this malady.

"The important point is that environmental conditions outside the cell influence the course of the disease," Dr. McDonald commented.

Cancer is a disease in which cell growth is abnormal. Cancer cells have been called wild cells because of their erratic growth. Scientists have been studying the cells microscopically and with moving picture cameras in the hope of finding what makes some cells turn into the wild, cancer cells. It appears from Dr. McDonald's report that the cause of their erratic growth is to be sought outside the cell and in the surrounding tissues, and the blood.

"The state of the blood in cancer is of great importance because cancer becomes a systemic disease and cancer cells receive their nourishment from and give off their waste products to the blood," his report begins. "Therefore it is to be expected that the blood of cancer patients should differ from normal blood."

The difference, Dr. McDonald and associates found, is in the degree of alkalinity. The average alkalinity of the blood in the 26 untreated cancer patients studied was 13 per cent. above the normal. The alkalinity of blood or other biochemical solutions is determined by measuring the concentration of hydrogen ions. This is called in the chemists' shorthand, PH.

"Alkalosis of the blood plasma of untreated cancer patients seems to have a bearing upon the duration of their lives, or duration of life is a function of PH. In the series, the more alkaline the blood plasma of untreated cases, the worse the prognosis. Warning should be given in applying this rule to patients whose PH may be modified by treatment, complications or medication," Dr. McDonald's report stated.

The diagnosis of cancer in the patients of the study was confirmed by examination of a small piece of tissue removed from the tumor, or by post mortem examination of the patient's body.

"This is very far reaching in the future study of cancer," Dr. McDonald declared. "In marine eggs, if the balanced sea water is made more alkaline, the rate of division and multiplication is increased and vice versa. The analogy holds for cancer and the obvious is to attack the disease through the blood or environing fluid, which may have some hope of success."

Encouraging as is this statement, it should be clearly understood that a cure for cancer has not yet been discovered.

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CHEMISTRY

## Gas Made Non-Poisonous By Famous German Chemist

CARBON MONOXIDE, the ingredient in ordinary household gas that makes it poisonous, can be extracted by a new process invented by the noted German chemist, Dr. Franz Fischer of the Coal Research Institute at Mülheim, Germany.

Dr. Fischer's process consists in passing the gas through sewage sludge, which swarms with bacteria. These remove the carbon monoxide and recombine the carbon with hydrogen, returning it to the gas as methane, which has a high fuel value and is not poisonous.

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PHYSICS

# Five Hundredth of an Atom's Diameter Measured Exactly

A NEW LOW in the measurement of extremely small lengths was announced to the meeting of the American Physical Society in Washington last week by Prof. Arthur H. Compton, Nobel Prize laureate and University of Chicago physicist.

He has measured the length of waves in the X-rays correct to the five-hundredth part of the diameter of a single atom. In inches this length is much lower than we can conceive. It is the hundred thousandth part of the millionth of an inch.

The wave length itself measured by this process was about 700 atom diameters, and was thus known with an accuracy of one part in 300,000.

The measurement, said Prof. Compton, is made with an instrument known as a double X-ray spectrometer. In a spectrometer the rays fall on a crystal which breaks them up into their constituent vibrations. By noting the angle at which these leave the crystal the wave length, that is the distance from crest to crest of the vibrations, can be estimated with extreme accuracy.

A double spectrometer, a recent refinement, is even more powerful in searching out these small distances.

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