

## MEDICINE

# Reprieves But No Cures

**Victims of leukemia, Hodgkin's disease and lymphosarcoma can be treated with chemicals, but sooner or later they develop resistance.**

By JANE STAFFORD

(Fourth in a series of five articles on what can be done about cancer)

► FOR THE unfortunate victims of one group of cancerous diseases, reprieve rather than cure is the rule. This group includes the so-called blood cancers, or leukemias, Hodgkin's disease and lymphosarcoma.

Lymphosarcoma in most cases affects the lymph nodes, or glands, in the chest, or the tonsils and lymph nodes in the neck. These spots of abnormal growth do not spread until late in their course, so the condition can be cured if treated before it has become generalized.

Somewhat like lymphosarcoma is Hodgkin's disease. A painless swelling of the lymph nodes, or gland, in the neck is usually the first symptom. Intractable itching and bouts of fever come next. Then the patient feels tired and listless, loses weight, becomes anemic and has pains in his bones. The patient with Hodgkin's disease will have periods when he feels better and seems to be quite well. This is called a remission, and it may come whether he has had treatment or not. The average length of life in this disease is about three years. But about seven per cent of patients who have been treated are alive 10 to 15 years after the symptoms started. In a few rare cases, the patients have lived 25 years. The facts that remissions, both natural and after treatment, may last a long time and that some patients may continue to relapse and get better over a period of years makes it difficult to determine whether or not any Hodgkin's disease patient has been cured.

The leukemias, sometimes called blood cancers, are of two main types. One is called myeloid leukemia. In this, there is an increase in the number of a special kind of white blood cells. These white blood cells are called granulocytes. This kind of leukemia involves the bone marrow and spleen primarily, the lymphoid tissue secondarily.

In lymphoid leukemia, on the other hand, both lymphoid tissue and bone marrow seem to be involved at the same time, though the main changes may be in the spleen and lymph nodes. In this type of leukemia, it is the lymphocytes of the white blood cells that are affected.

An acute form of leukemia attacks young children from about two to five years old especially. This is a swift killer, death coming usually in a few months. High fever, multiple hemorrhages and rapid wasting

are the symptoms during the short course of this disease.

Young adults in their 20's are the chief victims of myeloid leukemia and Hodgkin's disease. These two are twice as common in men as in women. Lymphoid leukemia comes later in life, attacking chiefly the 40- to 60-year-olds. This kind of leukemia is three times as common in men as in women.

As with Hodgkin's disease, the first symptom of lymphoid leukemia is often a moderate, painless enlargement or swelling of the lymph nodes in the neck. In myeloid leukemia, on the other hand, the first symptom is an enlargement of the spleen which causes a dragging sensation, abdominal distention, or attacks of acute pain in the region of the spleen. Loss of weight and energy, breathlessness and pale color develop because of the anemia that goes with this leukemia.

For all these diseases, the main treatment is radiation. The treatment does not cure,



**NEW SMITHSONIAN SECRETARY**—Dr. Leonard Carmichael, president of Tufts College, Medford and Boston, Mass., will take over his new duties as secretary of the Smithsonian Institution in January, 1953, following the retirement of Dr. Alexander Wetmore.

but produces remissions of varying lengths. In recent years, a battery of chemicals has been added to radiation treatment of these diseases. One of the first was a combined chemical-radiation treatment, radioactive phosphorus which could be taken by mouth. Spleen, bone marrow and other spots affected by these diseases concentrate several times the amount of phosphorus that other body tissues take up. Consequently the radioactive phosphorus is one way of getting more radiation to the diseased tissues in leukemia.

Still newer in the fight against leukemia and Hodgkin's disease are urethane, the nitrogen mustards, anti-folic acid chemicals, and the hormones, ACTH and cortisone, which first sprang into fame as arthritis remedies.

For some patients these different chemicals are used in series together with radiation. When one no longer produces a remission, or makes the patient sick as sometimes happens, another is used until it, in its turn, no longer benefits the patient.

Most interest at present seems to center on the folic acid antagonists, or "anti-folics" as they are called. These chemicals are keeping alive children with acute leukemia who ordinarily die within a few months. Survivals of two and three years instead of a few months have been reported in a few cases. When cortisone or ATCH is added to the anti-folic acid chemical treatment, some children survive even longer than when treated with the anti-folic alone.

But none of these treatments can be called a cure. This is apparent from reports at the Second National Cancer Conference. The reason given is that the leukemic cell has or develops resistance to the chemicals.

About one-third of all patients with acute leukemia are resistant to the chemicals from the very beginning. The others acquire resistance sooner or later. Summing up experience since 1948 with these chemicals, one authority, Dr. Sidney Farber, of Children's Hospital, Boston, said:

"If the problem of resistance, either initial or acquired, of the leukemic cell to the folic acid antagonist could be solved, the usefulness of the antagonists in acute leukemia could be compared with justice to that of insulin in diabetes."

**Next Week: Forecast for 1975.**

Science News Letter, April 19, 1952

## GENERAL SCIENCE

## Dr. Carmichael Elected Secretary of Smithsonian

► THE ELECTION of Dr. Leonard Carmichael as the new Secretary of the Smithsonian Institution of Washington, D. C., has been announced by Fred M. Vinson, Chief Justice of the United States and Chancellor of the Institution. Dr. Carmichael, a nationally-known figure in education and science, is now president of Tufts College in Medford and Boston, Mass.

Dr. Carmichael will become the seventh Secretary of the Smithsonian Institution when he takes over his new duties in January 1953. He succeeds Dr. Alexander Wetmore, who reached the age of retirement in June 1951.

Dr. Wetmore, a distinguished ornithologist, desires to give his full time to his scientific researches, but consented to serve until his successor could be elected and assume the duties of the position.

In 1938 Dr. Carmichael was unanimously elected president of Tufts College by its Board of Trustees. During his administration, he continued his research work in the field of sensory psychology and physiology and has published books in this field.

He is a member of the National Academy of Sciences, the American Philosophical Society, former president of the American Psychological Association, former chairman of the American Council on Education, and belongs to numerous other professional and scientific societies in this country and abroad.

During the second World War, Dr. Carmichael was director of the National Roster of Scientific and Specialized Personnel. This agency listed and mobilized the nation's scientific workers for the war effort. He is now a member of the Naval Research Advisory Committee and of advisory committees to the Research and Development Board of the Office of the Secretary of Defense and to the Veterans Administration.

Science News Letter, April 19, 1952

#### SEISMOLOGY

### Oklahoma Center for Mild "Unusual" Earthquake

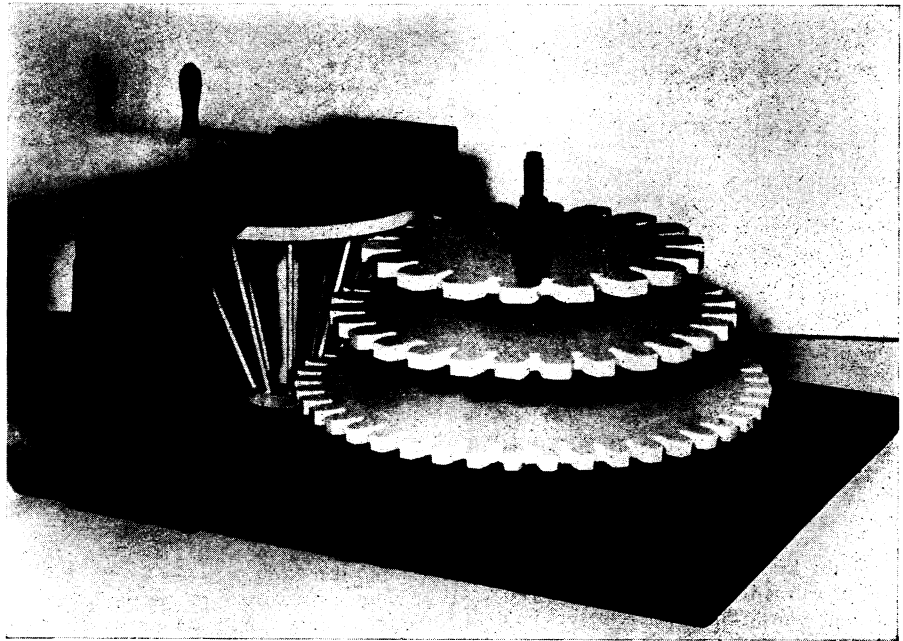
► THE EARTHQUAKE that shook six southwestern states Wednesday (April 9) was "very unusual," seismologists at the U. S. Coast and Geodetic Survey said in Washington. Reports from the delicately balanced instruments that record earth tremors were received from all over the country. Seismologists pinpointed the earthquake's epicenter 35.5N and 98W.

This is close to El Reno, Okla., and was also near the epicenter for the last two earthquakes that rocked Oklahoma, one in 1918 and one on Aug. 19, 1933. All three quakes have had an intensity of about six. This is a non-instrumental rating indicating slight damage in poorly-built buildings, that furniture is moved, and that persons in the area become frightened and alarmed.

Earthquakes occur when the strains and stresses in the earth's crust become too great and are adjusted by sudden slips and breaks. The Oklahoma earthquake was only a slight adjustment of the crust, such as occurs somewhat more often on the east and west coasts, than in the midwest states.

This earthquake occurred when the vast underground Nemaha mountain range, extending from Nebraska to Oklahoma, shifted slightly, causing tremors recorded in Iowa, Kansas, Missouri, Nebraska, Oklahoma, and Texas.

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*DA VINCI INVENTION—A variable speed drive meshed three cogged wheels of different diameters with the same lantern wheel to obtain different speeds of rotation in the da Vinci invention. The idea shown in this model is found today in our modern automobile.*

#### GENERAL SCIENCE

## Leonardo DaVinci, Scientist

► SCIENTISTS AS well as artists are celebrating the 500th anniversary of the birth of Leonardo da Vinci, born April 15, 1452.

Leonardo is best known for his great paintings such as Mona Lisa and The Last Supper. But he was also a creative genius in the fields of anatomy and physics as well as aviation. He was a prolific inventor.

The modern helicopter had its prototype in Leonardo's invention of an aerial screw to be operated by clockwork. This device was also the forerunner of the airplane propeller. Leonardo's "tent of linen" was the first successful parachute.

His also was the first known self-propelled vehicle, a kind of flat car driven by a spring. His device for lifting heavy weights looks remarkably like that necessary automobile tool, the jack.

Leonardo invented a projector for throwing an enlarged image of an object onto a screen. This projector, illuminated by a candle, was the prototype of the magic lantern and later the motion picture projector.

Leonardo, who was chief military engineer of Cesare Borgia, was responsible for many military inventions. They include a machine gun, aerial bombs, a steam gun, shrapnel, and a diver's apparatus. The last, Leonardo never completed because he was afraid it might be used by men working under water to damage ships.

As an artist, he was interested in the accurate portrayal of human and animal figures and this led him to a detailed study of anatomy. He was the first to show a fetus in its proper position within the uterus and the first also to show a double curvature of the spine.

He made a detailed study of the positions and movements of birds in flight and this inspired him to design a flying machine with wings like a bird's. The pilot was to lie prone in the frame and flap the wings by moving his feet in stirrups attached to a pulley system. At the same time he was to operate a windlass with his arms to guide the machine.

In spite of his many scientific discoveries, observations and inventions, Leonardo never published a book or scientific article. All we know of his scientific work has been gleaned from voluminous notebooks profusely illustrated by his own drawings. His notes were made extremely difficult to decipher because Leonardo, a lefthanded man, wrote in a reversed handwriting which could only be read by the aid of a mirror and he used many abbreviations. For over 250 years the material remained unknown. Venturi's first discussion of his notebooks was dated 1797 although Leonardo died in 1519.

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