



**CHROMOSOME PHOTOGRAPHED**—This picture showing the structure of gene-carrying matter was taken by an electron microscope.

MEDICINE

## Clues to Stomach Cancer

Simple indications lead to detection of stomach cancer if they are given attention early. Cancer can be removed before it grows large.

*Highlights of the American Medical Association's centennial meeting, covered for Science Service by Jane Stafford, can be found on pages 387 through 390 and page 392.*

► **NEW CLUES** for detection of stomach cancer before it becomes incurable were presented by Dr. Gilson Colby Engel of Philadelphia at the meeting in Atlantic City of the American Medical Association.

The clues are so simple that the average patient and doctor might overlook their significance. They are: a weak and tired feeling; loss of appetite, particularly for meat; and a mild kind of indigestion or stomach discomfort that comes either before or after eating.

Stomach cancer is at present one of the most hopeless forms of this disease. It kills 38,000 persons a year in the United States, more than any other kind of cancer. One person dies of stomach cancer every 18 minutes.

This "startling" high mortality rate can be reduced, Dr. Engel stated.

Stomach cancer can be cured by an operation to remove the cancer, if the patient gets to the surgeon before the cancer has grown so large and spread so far through the body that it is too late.

The operation, even when the entire stomach is removed, carries a mortality rate of only 18%. If only part of

the stomach needs to be removed, the mortality is less than three percent. But without the operation, mortality for stomach cancer is 100%.

Pain, loss of weight, anemia, nausea and vomiting of blood are not reliable early signs of stomach cancer. In the majority of cases, they appear too late.

For saving the thousands of lives taken each year by stomach cancer, Dr. Engel urged the following procedures:

1. Patients to see their doctors if stomach symptoms of any kind, or a weak, tired feeling or loss of appetite lasts more than two weeks.

2. Doctors to make X-ray studies at once on patients complaining of these symptoms. "You must not forget that the patient has tried all the medical preparations and vitamins before he came to you," Dr. Engel warned.

3. Every annual physical check-up to include X-rays of the stomach.

4. Operation to be done on any patient diagnosed as having stomach ulcer in whom after four weeks of medical treatment X-rays show the ulcer still present even if the patient no longer has symptoms.

Many patients with stomach cancer, Dr. Engel said, are relieved of symptoms by medical treatment for stomach ulcers. But the relief is only temporary. And when next they have pain, indigestion

and other symptoms, the cancer has reached the hopeless stage. It is because of this danger, when early stomach cancer is mistaken for stomach ulcer, that he urged operation if the supposed ulcer still shows on the X-ray picture after four weeks, even when the patient's symptoms have been relieved.

*Science News Letter, June 21, 1947*

GENETICS

## Knowledge About Heredity From Photograph Studies

► **THIS PICTURE**, which an imaginative youngster might tell you is a Jubjub Bird fleeing from a Frumious Bandersnatch, is in sober actuality a record of the newest triumph of that almost fabulously powerful research tool, the electron microscope. It is the first electron microscope photograph of chromosome details to be published in a newspaper. Similar photographs were published in *Science* (June 13).

Chromosomes, as you may recall, are the extremely minute particles of living matter in the nuclei or centers of cells that carry the units of heredity, or genes. Genes determine whether you are blonde or brunette, tall or short. They are so small that even the most powerful of ordinary microscopes fail to give sufficiently large-scale views of their details. But they are so fragile and delicate that there seemed no way to lay them out properly for the bombardment with electron streams that makes pictures in the electron microscope.

The problem was finally solved by Prof. John T. Buchholz, head of the botany department at the University of Illinois. Using instruments so fine-

pointed that their operation has to be guided through a microscope, he dissected several types of plant cells, snared out their chromosomal threads and laid them on the electron microscope's specimen holder. The chromosomal material dried and hardened sufficiently to withstand the brief but intense electron bombardment.

The chromosomal threads shown here, at originally photographed 30,000 times their actual size, were taken out of one of the pollen-forming cells in the

tassel of a corn-stalk. The darker, bead-like masses may be the actual genes, or at least the places where these elusive ultimate units of heredity reside. They appear to be strung together on a ribbon-like uniting filament, much smaller than the dark masses.

Now that a method for getting photographs of chromosomes has been developed, it can be expected that it will be used in obtaining a more exact knowledge of heredity.

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#### MEDICINE

## Instrument Fights Cancer

**Bronchoscope is used to diagnose lung cancer and may save hundreds of persons a year in the U. S. This method succeeds when others fail.**

➤ A NEW WAY to fight cancer was announced by Drs. Louis H. Clerf and Peter A. Herbut of Jefferson Hospital, Philadelphia, at the meeting in Atlantic City of the American Medical Association.

A quarter or more of the 6,000 persons who die of lung cancer every year in the United States may be saved as a result.

An instrument familiar to doctors and to many parents is the chief weapon that will save more and more lung cancer victims. The instrument is the bronchoscope, a long, narrow, hollow tube that reaches down the windpipe to the lungs. It has already saved thousands of lives of children who accidentally sucked toy whistles or safety pins or buttons into their lungs.

Now the bronchoscope can be used to suck out microscopic bits of tissue from the farthest parts of the lungs. Examined under the microscope, these bits of tissue will tell whether or not the patient has a cancer in his lungs.

The cancer can be detected in this way when no other method will reveal its presence. If the cancer is found early enough, the patient can be saved by having the cancer or the entire lung removed.

First sign of lung cancer that takes a patient to his doctor is a dry cough. He may spit a little blood. X-rays of his chest may or may not have a suspicious shadow. But all these signs may mean some condition other than cancer. They may mean tuberculosis.

A tiny forceps attached to the end

of the bronchoscope will pinch out a bit of tissue for examination if the cancer is near enough the windpipe to be reached by the bronchoscope.

When it is way off at the edge of the lungs, Drs. Clerf and Herbut shoot a little salt solution through the bronchoscope and suck it back out again. If the cancer is present, a few cells shed by the cancer, the way the skin normally sloughs off cells, will be sucked out in the salt solution. They can be identified under the microscope and the diagnosis made.

In the past year, Drs. Clerf and Herbut have detected 32 cancers, out of a group of 118, that had not been detected by any other method.

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#### MEDICINE

## Test for Pregnancy Gives Answer in Only Two Hours

➤ A TEST for pregnancy that gives the answer in only two hours was announced by Drs. Herbert Kupperman and Robert B. Greenblatt of the University of Georgia School of Medicine to the American Medical Association meeting in Atlantic City.

The test is made by injecting a few drops of the woman's kidney excretion into an immature rat. Two hours later the rat is killed by an overdose of ether. If the rat's ovaries are red and engorged with blood, the woman is pregnant.

The test has been done for more than 1,200 patients. It was accurate in 99.8% of the cases.

Prime purpose of the test is not just to tell a healthy woman that she is going to have a baby but to give the doctor a chance to save life in cases of ectopic pregnancy. In these cases, the baby is developing in the mother's body but outside the womb. This unnatural state of affairs endangers the baby and the mother, too. In many cases, speedy operation can save the mother.

The signs of this condition may be mistaken for appendicitis or for tumors. The new two-hour test will give the diagnosis between the time the patient is brought into the hospital and the doctor and patient are scrubbed up and prepared for the operation. Other pregnancy tests take from six to 96 hours.

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