

MEDICINE

Cancer Not Caused by Virus Columbia Scientists Find

CANCER is not caused by a virus. This is the opinion, contrary to that of some scientific investigators, of Drs. J. W. Jobling and E. E. Sproul of Columbia University College of Physicians and Surgeons.

New experiments with tobacco mosaic and cowpox viruses and the famous Rous chicken tumor, supporting the opinion that cancer is not virus caused, are reported by Drs. Jobling and Sproul, (*Science*, Mar. 12).

Instead of being a virus, they think the agent that causes the chicken tumor is something produced by abnormal physical and chemical processes in the cells of the chicken's body. This substance or agent has the chemical nature of a lipid, which is in the fat class. Consequently, the scientists reason, it is unlikely that this substance can reproduce itself. How this substance can cause the tumor disease is explained as follows:

"It seems probable that it possesses

the ability when injected into normal animals under proper conditions to stimulate normal cells to produce a similar substance and thus perpetuate the disease."

The belief that cancer is caused by a virus is based, Drs. Jobling and Sproul point out, on the demonstration that the tumor-producing agent of some chicken tumors can pass through a Berkefeld filter without losing their tumor-causing activity. A disease-producing agent which retains its activity after passage through a Berkefeld filter is generally held to be a virus, so the chicken-tumor-producing agent was classed as a virus.

If the chicken tumor is caused by a virus, then viruses must be classified according to their chemical properties. The virus of tobacco mosaic is a protein and cowpox virus, from which smallpox vaccine is made, is also protein, but the chicken tumor virus is a lipid.

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AGRICULTURE

Bacteria, Molds and Yeasts Promise Farm Problems Solution

BACTERIA, molds and yeasts, more noted now as disease-bringers and spoilers of things than for their useful activities, were hailed as potential factors in the solution of America's agricultural problems by Prof. Ellis I. Fulmer of Iowa State College, speaking before the Midwestern Conference of Agriculture, Industry and Science.

Farming, Prof. Fulmer pointed out, is essentially a chemical manufacturing process. The farmer is foreman in a chemical factory, wherein his crop plants are living machines using the energy of sunlight to make carbohydrates, fats, and proteins out of raw materials from air and earth. In the process, energy is woven into the things that come out as end-products.

Formerly the farmer cashed in on the release of a large part of that stored energy by feeding crop products to his work animals. Now he uses tractors and power machinery instead of horses and

mules. So the products pile up, creating economic crises which can be only temporarily solved by crop limitation methods.

A considerable part of the answer can be found, Prof. Fulmer pointed out, in turning over the job of digesting carbohydrates (starches and sugars) to bacteria, molds, and yeasts. These use up part of the energy in their life processes, but they turn back to the chemical industrialist a great variety of liquid fuels, solvents, ingredients for explosives, etc. Prof. Fulmer displayed a list of more than forty products that can be obtained from the microorganic fermentation of carbohydrates, only a few of which have present economic uses.

Unfamiliar Uses

Most of us are familiar with starch mainly as white stuff used in stiffening shirt fronts and making cornstarch pud-

dings, and we know syrup principally as a thick brown liquid that gets poured on pancakes—and unaccountably smeared all over children's faces. Dr. Norman F. Kennedy of the Corn Industries Research Foundation told the conference of a number of less familiar but very important uses of these two principal industrial products of corn.

Starch is used in enormous quantities in the manufacture of textiles, long before they are cut and sewed into shirts or sheets. It plays an important role in the production of paper, twine, burlap bagging, and many kinds of adhesives. Syrup from corn also has its uses in the textile and paper industries, and in such diverse industries as tobacco manufacturing and the tanning of leather.

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SEISMOLOGY

Earthquakes During "Storm" Were Difficult to Trace

THE two earthquakes of March 8 and 9, respectively—Monday's at San Francisco, Tuesday's a renewal of the recent Midwest shocks—have left seismologists puzzled. Instruments in the regular seismological observatories over the United States and Canada seem to have ignored the San Francisco disturbance. At any rate, no reports from these observatories have been received in Washington. Yet the battery of "strong-motion" records, a special type of seismograph that works only when jarred hard by a strong local shock, went into action in the San Francisco region with almost every one of its twenty instruments.

One thing that may have interfered with the records of some of the stations was a marked microseismic storm that was in progress when the San Francisco quake occurred. Microseisms are rhythmic minor earth tremors that keep on coming in for hours on end, like sea waves in a storm. Many scientists, indeed, believe that they are associated with the passing of major storm areas, such as the one that passed up the northern Atlantic during the past two or three days. The instruments at Canisius College in Buffalo, near Lake Erie, were busy all Sunday night and most of Monday writing microseism records, and show no trace of the disturbance on the California coast.

The second Midwest shakeup wrote its records on a number of instruments, but although the disturbed area was in the middle of a veritable ring of observatories its epicenter could not be