

## SCIENCE NEWS

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## THE ORGANISM CAUSING CANCER

THE success of the British scientists in cultivating, observing and photographing the organism that causes a malignant cancer in chickens is of great scientific interest, but it will not help any one now ill with cancer, according to Dr. Erwin F. Smith, senior plant pathologist of the U. S. Bureau of Plant Industry, and an authority on cancerous growths in plants and animals.

In a recent visit to London, Dr. Smith visited the laboratory of Dr. J. E. Bernard, one of the three British scientists whose work is creating so much interest. There he saw tubes of clear serum containing the invisible infectious organism. Then he observed the living organism dancing about in a drop of serum under a specially constructed microscope, and also photomicrographs of this germ that is so small that it can not be seen under the highest powers of any ordinary microscope and that will pass through the pores of filters which will not let through the smallest known bacteria.

But this organism which causes a malignant tumor in chickens is related only very indirectly to human cancer, according to Dr. Smith. Dr. Peyton Rous, of the Rockefeller Institute, who discovered and studied this chicken tumor in the United States, determined beyond question its malignancy, and also that it could be produced in chickens in the absence of any tumor cells. He took portions of the malignant tumor and killed the cells in various ways: by grinding, by freezing, by drying for months, and with these dead cells he could still produce tumors when they were introduced into susceptible chickens. He found also that the cause of the disease is a filter passer, that it is so small that it will pass through the pores of medium Berkefeld filters which will not let through the smallest known bacteria. Nevertheless, this clear filtrate would produce the disease. Thus, once for all, he settled the question that the cause of cancer may be something separable and independent of the tumor cell, a matter which had been denied for all cancers by many research workers who said that the tumor cell is the only parasite. Dr. Rous was never able to isolate, cultivate or see the cause of this tumor in spite of prolonged and diligent search.

What Dr. Gye and his colleague, Dr. Bernard, have done is to cultivate this organism through a whole series of tubes, to see it under especially constructed microscopes quite different from the microscopes in ordinary use, and to photograph it.

The organism is a very peculiar body unlike any ordinary bacteria and it seems to me problematic where it belongs in the natural classification of organisms. It is like the pleuro-pneumonia germ.

As to the general bearing of this discovery on the whole subject of cancer, Dr. Smith points out that nothing is yet known as to the cause of human cancer aside from the fact that very frequently, if not always, it appears

in irritated places; and if on its first appearance it is removed by the surgeon, it may never return, whereas if operation is neglected, the help of the surgeon comes usually too late.

A few years ago nothing also was known as to the cause of malignant tumors in the lower animals. But now we know of three tumors of the lower animals closely associated with parasites. One is a chicken tumor and two are in rats. In both of these rat tumors a worm appears to be the cause of the disease. Rats may be 100 per cent. susceptible to either tumor and no tumor results unless the worms are fed to the rats.

There are other experimental cancers apparently due to the application of certain chemical substances to the surface of animals. These are due to tar, arsenic, aniline and similar substances. Such cancers occur naturally in man and have been produced repeatedly in recent years in experimental animals. Only a portion of the animals become cancerous, although all are irritated by the applications, and not the whole irritated area in every animal becomes cancerous, but only tiny portions of it here and there. The question is raised whether the irritation is the direct cause, or whether it only paves the way for an organism.

It is possible to conceive that some stimulus might so disarrange the chromosomes or other substances in certain cells so that all their descendants would be abnormal and destructive to other portions of the body. This is one hypothesis. The other is that a parasite must be closely associated with the tumor in all its forms and stages, otherwise the growth would come again under the physiological control of the body.

## THE TUBERCULIN TEST

THE forcible ejection of Dr. Clark H. Hays, chief of the state bureau of animal industry, from the farm of John Burke, of Elkhorn, Nebraska, on June 30, has resulted in contributions from farmers all over the state toward a fund to test their rights under the Nebraska law for the eradication of tuberculosis in livestock. Burke, according to Dr. Hays, refused to allow his stock to be subjected to the tuberculosis test in accordance with state law.

This test consists of injecting an extract of dead tubercle bacilli under the skin of the cow. Fever, swelling and inflammation at the point of injection constitute a positive test. Cattle with a positive test are condemned and killed.

The slaughter of thousands of cattle each year under the Nebraska law and similar laws in other states seems to be the basis of the farmers' rebellion. Their complaints that many of the cows which are slaughtered following a positive reaction to the test are found to be without traces of tuberculosis are in line with a series of investigations by Professor E. G. Hastings and Dr. B.

A. Beach, professors of bacteriology and veterinary science at the University of Wisconsin. They reported to the Society of American Bacteriologists at their December, 1924, meeting that in twenty Wisconsin counties in three years, 387,180 cattle were tested, and 5,888 of these gave a positive reaction. Yet, on *post mortem* examination no evidence of tuberculosis could be found in 1,279 of the positive cases. In some of these latter they found a germ very similar to the one which causes tuberculosis, except that it was apparently harmless. Professor Hastings and Dr. Beach believe that this germ causes cattle to react positively and is the reason for many of them being needlessly slaughtered.

"Without the aid of tuberculin it would be absolutely impossible to attempt to control tuberculosis in live-stock," said Dr. J. A. Kiernan, chief of the tuberculosis eradication division of the U. S. Bureau of Animal Industry, when he was asked whether the accuracy of this method of testing is in doubt. "Before use of tuberculin became general," Dr. Kiernan stated, "physical examination of cattle was depended upon, but it proved futile in freeing herds of the disease.

"The same percentage of accuracy is shown by tests now as was found more than thirty years ago when tuberculin was first used for the purpose of diagnosing tuberculosis in cattle," he continued. "Of more than 20,000 animals that reacted to the tuberculin test during June, 1925, 92 per cent. showed positive lesions of tuberculosis on the ordinary *post mortem* examination. Many more of those animals would have shown lesions had a more thorough search been made. Furthermore, laboratory examinations of the tissues of the animals that showed no lesions would reveal at least one fifth of them to be tuberculous. In some of the states where thousands of reacting animals are slaughtered, cases showing no lesions are less than three per cent., thus indicating a very high degree of accuracy for the test."

Dr. Kiernan pointed out that the campaign for eradication of tuberculosis in live stock is going on in every state, and that it is purely voluntary work, carried on under state laws and regulations. No owner is required to submit his herd to the test except in areas where at least 75 per cent. of the other cattle owners have their herds tested. During the fiscal year 1925, 7,000,000 cattle were tuberculin-tested in the United States.

### A NEW DEWBERRY

A DEWBERRY that is larger and more resistant to disease than the ordinary berry now grown in gardens has been rediscovered and made available to the public through the efforts of horticulturists of the U. S. Department of Agriculture. This is the Young dewberry, a new hybrid variety which is wine-colored, somewhat darker than the Loganberry, but much sweeter than this favorite of the Pacific coast region. The new berry is suited for culture south of the Mason and Dixon line and west to Texas and Arkansas and it should prove specially satisfactory in the South.

This new fruit owes its origin to B. M. Young, an electrical engineer, who lives in Louisiana. As a hobby

he indulged in plant breeding and produced the superior Young dewberry by a hand cross between the Phenomenal and Mayes varieties. The new berry was thus created in 1905. It was not destined to take its place in the world at once, for Mr. Young was so busy in following his profession that his creation was nearly lost when the original plants were destroyed. However, he gave some plants to a friend who moved to Pennsylvania. This friend sent some to the U. S. Department of Agriculture and to a sister living in Alabama and it was in her garden and in the department's grounds that the superior fruit was rediscovered only two years ago. So important did the government officials consider the size and disease-resistant properties of the berry, that they sent George M. Darrow, horticultural expert, to examine all plantings of it. Sufficient stock of the new fruit has been propagated to release the new variety to the public through nurseries. It is believed that there is a possibility that the Young dewberry may even replace the Loganberry on the Pacific coast.

Dewberries and blackberries are very similar fruits and are practically the same botanically. The dewberry is a trailing blackberry, unable to stand erect because of its less woody stem.

### ITEMS

WOLF'S comet, which visits the neighborhood of the earth every eight years, was sighted on Monday, July 13, by J. Stobbe, astronomer at the Bergedorf Observatory near Hamburg, Germany. This information has been received by cable from the international bureau at Copenhagen, Dr. Harlow Shapley, director of the Harvard College Observatory, announced recently. When observed, the comet was in the constellation of Pegasus, just west of the "Great Square," in right ascension 22 hours, 58 minutes and 12 seconds, and declination 24 degrees, 16 seconds north of the equator. It is slowly moving towards the southwest. It will become brighter as it gets closer to the earth, but it is doubtful whether it will become bright enough to be visible to the unaided eye, even in the fall when it reaches perihelion and comes nearest the sun. Previously it approached within 149,000,000 miles of the earth. Since its last visit, however, it passed near Jupiter and was moved out of its former orbit by the great gravitational attraction of that planet, and now it will not come as close.

THE Temple-Swift comet is still far away from the earth, and the object sighted on June 28 by M. Delporte, a European astronomer, and supposed to be the comet, is in reality a tiny planet, Amphitrite, which has been known to astronomers for many years. This statement has been made by Dr. Edwin B. Frost, director of the Yerkes Observatory, as a result of photographs made of the object by Dr. George Van Biesbroeck of the observatory staff. "Delporte probably photographed the moving object while searching for the Temple-Swift comet," said Dr. Frost. "Later computations which we have received from England, however, indicate that perturbations by Jupiter will delay the return of that comet until next year."