

# THE SCIENCE NEWS-LETTER

*A Weekly Summary of Current Science*

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## CANCER FOUND INFECTIOUS DISEASE OF BLOOD CELLS RUN WILD

Two facts about the fundamental nature of malignant tumor, which may bring nearer the conquest of cancer in man, have been discovered by Mrs. Margaret R. Lewis, Carnegie Institution anatomist, and Howard B. Andervont, Johns Hopkins graduate student, conducting joint research.

First, they have found that, for one form in the chicken at least, cancer is a mass of white blood cells or corpuscles. White blood cells desert their normal function of being the soldiers of the body that repulse invading germs and poison, and, instead, run wild, multiply, and gorge themselves until they form the mass of the malignant tumor. Heretofore the nature and exact origin of the cancerous mass has been unknown.

Second, the investigators have discovered that cancer can be transmitted simply by injecting into the muscles of a well chicken either the blood plasma or the white blood cells of a chicken suffering from cancer. Not only is the simple inoculation by transplanted blood successful, but serial inoculations by means of blood have been continued through as many as four generations of malignant tumors. This is evidence of the infectious nature of cancer, for, while heretofore it has been demonstrated that portions of cancerous tissue when transplanted will produce cancer in another animal, it was not known that one could thus transmit the infectious virus repeatedly from animal to animal by means of either the blood plasma or the white blood cells.

Mrs. Lewis and Mr. Andervont content themselves with stating the simple experimental facts of their investigations which were conducted in the Laboratory of Embryology of the Carnegie Institution of Washington located in Baltimore. But it is to be expected that their facts will be eagerly applied to cancer research now being pursued intensively in all parts of the world. Their discovery was announced to the scientific world in two preliminary technical papers in the *Anatomical Record* for March 25.

One of the kinds of cancer used in the experiments was the famous Rous chicken sarcoma. Dr. Peyton Rous at the Rockefeller Institute of Medical Research proved this tumor could be transmitted not only by actual transplantation of its portions but also that normal cells could be stimulated to malignancy by the mere filtrate from the tumor. Now this tumor and also a chemically produced cancer, Carrel's indol sarcoma, have been found by Mrs. Lewis and Mr. Andervont to consist essentially of white blood corpuscles and to be transmitted by inoculations of white blood cells or plasma.

Neither of these two cancers are exactly the same as those found in man. The term "cancer" is very similar to the term "fever" in that it is the general name of a large number of different diseases. But the chicken cancers studied are similar to some disturbances of the lymphatic and circulatory systems in man, such as enlarged spleens, and other blood glands, that consist essentially of large masses of white blood cells, gone bad. It is believed that the same general principles that govern chicken cancer are likely to apply to human cancers, even of the usual carcinoma or epithelial type, and that therefore through the study of chicken cancer human cancers may be better understood. Tumors can be produced in a large variety of ways. Seven different bacteria, two types of parasites, various chemicals such as coal tar derivatives, and viruses, when injected into animals will each produce malignant growths.

Fully as important as their discovery of the identity of cancer cells with white blood cells, is the discovery that the infectious agent of cancer is carried in the white cells and in the liquid or watery portion of the blood of a chicken suffering from tumor. The infectious nature of cancer itself has been very much debated, and the fact that Mrs. Lewis and Mr. Andervont have demonstrated that the plasma of tumorous chickens produces cancer in 75 per cent, of the inoculations and that the white blood cells produce cancer in 95 per cent. of the attempts is startling evidence. Transplants of the cancer tissue produce 100 per cent. results. The conception that cancer is caused by a virus of some sort, perhaps a micro-organism too small to be seen through the most powerful microscopes, may thus be supported. The fact that cancer can be transmitted from one animal to another by these methods, serially time after time, is evidence that the infective agent reproduces itself or is regenerated by the host.

"The active tumor producing agent must increase greatly," said Mrs. Lewis, "for it is just as active in producing a tumor after it has been passed through a series of as many as four chickens, i.e., taking the blood from one chicken, inoculating this into another, waiting until the second chicken had formed a tumor at the site of the inoculation, then taking a little of the blood from this chicken and inoculating this into a third chicken, and so on until this has been carried as far as the fifth chicken. This discovery places the chicken tumor on the same basis as certain other diseases which are capable of being transmitted by the blood. This fifth passage of the tumor by means of the blood results in just as malignant a tumor, in fact often much more so than the original tumor. This is an entirely new point of view."

Cancer research is not the primary object of Mrs. Lewis' scientific work. She is an authority on cells and with her husband, Dr. Warren H. Lewis, also of the Carnegie Institution's Department of Embryology, she has made many significant contributions to our knowledge of the blood cells. Mr. Andervont is on the staff of the department of filterable viruses of the School of Hygiene and Public Health of Johns Hopkins University.

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The first state to establish a state university was Georgia.

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Seven radiobeacons have been established on the Great Lakes.  
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