

MEDICINE

Blood Difference in Cancer

Reversal of Proteus immune reaction offers hope of combining with protein measuring methods for good cancer detection testing of population.

➤ A BLOOD difference between untreated cancer patients and almost all the rest of the population, sick or well, has been discovered by scientists at Yale University School of Medicine, New Haven, Conn.

The difference is easily detected and may lead to a screening test for unsuspected cancer in large groups of people, as X-rays are now used to screen unsuspected tuberculosis patients in the population.

The difference the Yale scientists have found is the way the blood serum of cancer patients acts when mixed with Proteus antigen or vaccine. Proteus is the name for a large family of microorganisms. Some of them cause disease, others do not.

When a few drops of blood serum from a normal person is mixed with the Proteus material in a test tube, in a large percentage of cases there is a clumping, scientifically called agglutination. Blood serum from a large percentage of cancer patients does not react this way.

This gives a different kind of measure from other tests developed for cancer detection. Many tests now under study are for detection of changes in blood proteins developing specifically with cancer. The Yale test measures something normally present which disappears with cancer. Although not 100% accurate itself, it may prove very useful when given with one of the tests for protein changes. The combination of tests for two different mechanisms would be more useful, cancer authorities say, than a combination of several different tests for protein changes.

The Protein reaction difference was discovered by Drs. I. A. Parfentjev, E. E. Clifton and F. Duran-Reynals. They report details in the journal *SCIENCE* (May 4).

The Proteus clumping ability of blood serum disappears early in cancer and is more apparent early than late, Dr. Parfentjev said. This will add to the value of the difference if it becomes a cancer detection test, since early cancer is hardest to diagnose and also the most easily cured.

The test can be made easily in a few minutes with only a few drops of blood and the testing material is easily available.

Babies and children under five mostly have not developed Proteus clumping ability in their blood, the Yale scientists find. But 95% of normal grown-ups, and 14 out of 15 pregnant women, do have it. Patients with tuberculosis, mental sickness, non-cancerous growths and cancer patients after removal of the cancer have the Proteus clumping material in their blood.

Tests have been made on more than 500 persons with success, but many more hun-

dreds of tests must be made before this Proteus reaction can be accepted as a cancer detection test. At present Dr. Parfentjev is working on a method of measuring another blood difference between cancer patients and normal persons. This combined with the Proteus test may give a more accurate test than either one alone.

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AGRICULTURE

Electrified Dusts to Give Better Plant Disease Control

➤ BETTER CONTROL over insects and plant diseases is expected through use of electrically charged dusts. The process, to be field tested commercially this summer, gives five to ten times better coverage than normal dusting with fungicides and insecticides in laboratory tests.

Fine dust particles are charged with from 12,000 to 20,000 volts as they emerge from the nozzle of a regular commercial dusting machine. The high charge is held for several seconds. Since the dusts are blown at a velocity of about a mile per minute, they travel a great distance before losing their electrical charge.

Plants develop the opposite charge, thus attract the charged particles. The underside of leaves and the sides of the plant opposite the stream of dust also draw the particles to give excellent overall coverage.

Credit for the idea of using electrically charged particles for dusting with insecticides and fungicides goes to Henry D. Bowen, graduate research assistant at Michigan State College, East Lansing, Mich. An electrical precipitation process is used in many industrial plants to keep the soot from coming out of smoke-stacks, and Mr. Bowen based his dusting process on this principle.

A thin wire in the center of the dusting nozzle carries from 12,000 to 20,000 volts at very low wattage. Power consumption is very low and makes the apparatus even safer than an approved electric fence. A tractor battery system in conjunction with a dynamotor and a high voltage direct current power supply is sufficient for a four-row duster. Engineers estimate that the cost of necessary electrical attachments for the ordinary four-row duster would run around \$300.

Laboratory tests showed 11 times as much dust deposited on plants at four feet distance when particles were charged than when the same apparatus was used with no charge applied to the insecticide.

In a wind tunnel test under ideal conditions, more dust was accumulated on plants at 32 feet from the nozzle when particles were charged than at four feet away when uncharged. Scientists feel certain that the effective charge can be retained in the dust particles long enough to dust tree tops.

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ELECTROSTATIC DUSTING—Henry D. Bowen, Michigan State College graduate assistant, who developed the electrostatic dusting process, shows here how the method works. The apple on the left became coated when held in the charged dust, while the one on the right, although receiving the same amount of uncharged dust, remained uncoated.