MEDICINE

Lung Cancer Diagnosis

➤ LUNG CANCER can be diagnosed in ten minutes by an electrical skin resistance test developed at Johns Hopkins University School of Medicine, Baltimore, Md.

The technique promises to be of great value in identifying some lung cancer patients among those with chest ailments. Presently lung cancer is only four percent to five percent curable because it is so hard to detect in an early stage.

The test is expected to show up all early cancers that affect sympathetic nerves. The investigators do not yet know what percentage of lung cancers might be detected in a curable stage, because they do not know what proportion of them press upon or damage nerves before they spread to other tissues.

The equipment and test devised by Dr. Curt P. Richter are extremely simple. The equipment is composed of two small batteries of 22.5 and 90 volts, wires, two electrodes and meters that record the flow of current and resistance to it. A technician can operate the portable, inexpensive equipment.

The technician attaches one electrode to the patient's leg and runs the other electrode, which is a small metal wheel, over specific skin areas. The electrical resistance of various skin sites is recorded by meters and mapped by the investigator on a drawing of the human body. A hot room, at 100 degrees Fahrenheit, increases the system's sensitivity.

The sympathetic nervous system controls the skin's resistance to the current. The more active the sympathetic nerve, the less resistance the current will encounter. If the nerve is compressed or damaged as by a tumor, the condition will register in increased resistance to the current.

Lung cancer patients show four kinds of resistance patterns, all of them different from the normal. Various patterns represent the location of the tumor and its spreading colonies in relation to specific sympathetic nerves.

Dr. James F. Fries worked with Dr. Richter in studying lung cancer patients' resistance. They expect to continue their studies to find out the true value of the technique.

The American Cancer Society supported early development of Dr. Richter's technique, and the U.S. Public Health Service has financed recent tests.

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SPACE

Robots' Space Ride

➤ THE UNITED STATES will make a second attempt to send two oxygen-breathing mechanical men on a quick trip into space and back, Jan. 5, after the initial effort, Dec. 9, ended in failure.

The passengers, who will be strapped in the ejection seats, will not look much like humans.

They will consist of batteries, cameras, sequencers, lights, instrumentation components, timers and a tape recorder to note special vibrations and temperatures during launch and reentry.

Four cameras will record the instrument panels and capture what a real pilot would see from the left window. Spacecraft coolant will be circulated through coldplates on the robots, allowing a normal oxygen flow through them. That's about as far as the body's metabolism will be simulated, however.

The robots will perform duties normally done by the flight crew. These include signaling for the spaceship to separate from the launch rocket, turning the ship around and slowing it down.

The main mission of the shot, however, will be to test the Gemini capsule, not the "men" inside. National Aeronautics and Space Administration engineers want to know if the capsule can withstand entering the atmosphere under the hottest possible conditions.

In order to get the capsule into extreme heats, it will be launched from Cape Kennedy, Fla., on a cannonball orbit, much like the one that Maj. Grissom rode on three and a half years ago in a Mercury craft. The whole flight will last 20 minutes with the spacecraft reaching an altitude of 106 miles and traveling 2,150 miles downrange.

The engineers want to find out especially how the rear part of the capsule will hold up under heat generated when the capsule is rammed back through the atmosphere at 16,600 miles per hour.

U.S. Navy ships will be deployed along the flight path to recover the spacecraft after it parachutes into the sea, hopefully about 800 miles east of San Juan.

This will be the second test of the Gemini spacecraft. The first, conducted last April 8 without live or mechanical passengers, went off without a hitch.

NASA announced that if this second test shows major deficiencies in the spacecraft or its modified Titan II booster, the Gemini program could be set back another four to six months for further design changes.

Already the program is a year and a half behind schedule and is costing $1.2 billion, about twice as much as originally estimated.

The object of the Gemini program is to practice techniques in space that will be necessary for the Apollo men-on-the-moon adventure scheduled for around 1970.

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U.S. Soil Conservation Service

SNOW PILLOWS—Shown above is the experimental snowfall measuring station on Mount Hood, Ore., just prior to a snowfall. Snow hydrologists, experimenting with a variety of sizes and shapes of alcohol-filled butyl rubber pressure pillows to determine the optimum specifications for snowfall measuring efficiency, found that the large 12-sided pillow in front of the square platform gave the most accurate readings.

TECHNOLOGY

Water-Tight Pillows Measure Snowfall

See Front Cover

➤ WATER-TIGHT PILLOWS may soon be used to measure snowfall.

Tests recently conducted by the U.S. Soil Conservation Service at Mt. Hood, Oregon's 11,245-foot peak seen on this week's cover, showed the pillow device to be more accurate than the old method of sinking a tube in the snow. The snow-filled tube, of known weight when inserted, is withdrawn and weighed to get the measurement. This is how the new system works:

A water-tight pillow, made of butyl rubber and filled with a low-freezing liquid such as methyl alcohol, is placed on the ground. Size of cushions tested varied but the one giving best results is 12-sided and 12 feet in diameter.

A narrow gauge tube leading to a pressure-measuring device is connected to the cushion. The weight of the snow displaces the alcohol in the pillow and rises up in the measuring gauge.

The device, after several months of testing, was found to be sufficiently accurate to record as little as one-tenth of an inch additional snowfall.

Butyl for the pressure pillow, expected to be of value in closer calculation of water supply, is supplied by the Enjay Chemical Co., New York, N.Y.

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