

MEDICINE

Arsenic Spots Tumors

► **BRAIN TUMORS**, which make up five percent of all cancers, can be spotted early by radioactive arsenic in a paper pattern method announced at the American Medical Association meeting in San Francisco.

The method was devised by Dr. Gordon L. Brownell, physicist, and Dr. William H. Sweet, brain surgeon, of Massachusetts General Hospital, Boston.

Radioactive arsenic is injected into the patient's veins. The amount of arsenic is so small it cannot poison the patient. Then the patient lies for one hour with his head comfortably supported between two Lucite arms, or grids, connected to a machine that records radiation densities.

Radioactive arsenic is one of several chemicals that concentrates in brain tumors. The machine continuously scans the head at a predetermined rate to pick up the arsenic location. Then it prints on a paper outline of the head a pattern of either curved or straight lines.

If a tumor is present, the lines are close together over the exact region of the tumor. If the lines are curved, this means the tumor is on the right side. If they are straight, the tumor is on the left.

The method is painless and simple for the patient. It does not involve an operation to inject air or dyes into the head, as previous methods do. It has been used on some 300 patients with about 75% accuracy in spotting brain tumors and even higher accuracy in spotting brain abscesses.

Dr. Sweet now considers it so accurate that if the patient's symptoms point toward a brain tumor and the new machine con-

firms this, he operates without resorting to other methods for determining the tumor's location.

He and Dr. Brownell are now working on a new machine which they expect will have an even higher accuracy rating.

One important advantage of the new method is that it can distinguish between brain tumor and a clot or hemorrhage on the brain. The arsenic does not pour into the bloodless or hemorrhagic area of the brain. This should be valuable in older patients who might from the symptoms have either a tumor or a stroke from blood clot or hemorrhage on the brain.

In many of these, marked improvement following the attack leads to the false assumption that it was a stroke. Then the tumor may be overlooked until it gives further symptoms by which time it may be too late to save the patient.

The radioactive arsenic tumor detection method differs from other radioactive chemical detecting methods. Instead of depending on the gamma rays from the radioactive chemical to spot the tumor, it depends on annihilation of positrons. When these are given off by the radioactive arsenic and collide with an electron, the positrons are annihilated. Then two electromagnetic quanta leave the scene back to back.

The new machine is designed to record each photon of the annihilation pair. This coincidence counting system eliminates scattered radiation that would obscure the tumor pattern and gives a more accurate and exact picture of the tumor.

Science News Letter, July 3, 1954



SUPER MICROSCOPE — T. A. Smith, left, vice president of the Radio Corporation of America, explains operation of world's most powerful electron microscope to Oscar Thorsing, permanent delegate to United Nations from Sweden, who accepted new instrument for the Karolinska Institute in Stockholm.

BIOCHEMISTRY

Cell Acid May Give Male Fertility Index

► **DISCOVERY** OF a possible index to a man's ability to father children was announced by Drs. David R. Weir and Cecilie Leuchtenberger of Cleveland at the meeting of the American Society for the Study of Sterility in San Francisco.

When a couple tries unsuccessfully to have children, the cause of sterility may be some condition in either the husband or the wife.

The new index to male fertility is based on the amount of an acid in the spermatozoa, the male germ cells. The acid is DNA, short for desoxyribonucleic acid. This acid is found in the nucleus of cells and is considered one of the vital chemicals of the body.

In a group of human males of proved fertility, the amount of DNA per spermatozoon was very constant and uniform for each person and for the group as a whole, the Cleveland researchers found.

In childless couples, where study of the wife showed she is presumably fertile, the DNA content of the husband's spermatozoa is often abnormal. In such cases of abnormal DNA content, the routine semen analysis is also usually, but not always, abnormal.

In some couples where routine study showed no cause for the childlessness, the DNA content of the spermatozoa is abnormal.

Science News Letter, July 3, 1954

A termite colony may contain 3,000,000 individuals.

MEDICINE

Aid Sclerosis Victims

► **NEW HELP** for multiple sclerosis patients was reported by Dr. Richard M. Brickner of New York at the meeting of the American Medical Association in San Francisco.

The help, which Dr. Brickner calls "relief by flush," is not a cure. But it does relieve new symptoms of the disabling disease, abolishing them or reducing them for a long time so that the patient can be kept relatively free of the new symptoms.

Multiple sclerosis, or MS as it is called for short, is a baffling disease of the nerves in which nerve sheaths are destroyed. Symptoms, which vary from double vision to loss of bladder control and inability to walk, develop according to which nerves are affected.

Since there is no cure for the disease, patients might be saved some of the more disabling features if new symptoms could be controlled.

The "relief by flush" which Dr. Brickner reported is obtained by giving drugs that

dilate blood vessels. Amyl nitrite, familiar to many heart disease patients, is one of the drugs Dr. Brickner uses. Another is histamine diphosphate, given by iontophoresis, in which an electric current carries the drug through the skin. Or the patient may be given carbon dioxide to breathe for about 10 minutes.

The "flush" from these blood vessel dilating drugs comes within a few minutes and lasts only a short time. For this reason when the phenomenon was first discovered, doctors did not think the accompanying relief of symptoms would last. However, Dr. Brickner has now found that symptom relief lasts from a few hours to several days and "sometimes indefinitely."

"Relief by flush" has now been given to 77 patients for 250 symptoms. More than 90% of new symptoms have been relieved in more than 90% of the patients.

If the symptoms return, the treatment can be repeated and will again give relief.

Science News Letter, July 3, 1954