the action of this poisonous and radioactive element was reported by Walter E. Kisieleski and Austin M. Brues of Argonne National Laboratory, Chicago. Fifty-five percent of the plutonium injected is still retained by the body 265 days later, mostly in bone.

Make New Hydrocarbons

➤ NEW SOURCES of aviation fuel spur chemists to create hot-burning liquids economical to manufacture. R. M. Caves and R. L. McLaughlin of the Mellon Institute, Pittsburgh, and P. H. Wise of the National Advisory Committee for Aeronautics, Cleveland, reported to the meeting on their success in making a series of such compounds.

Linking together substances similar to carbolic acid and hydrocarbons derived from propane, these chemists get a satisfactory amount of new hydrocarbon compounds in a series of three diphenyl alkylpropanes and the corresponding dicyclohexyl compounds.

Thirteen new organic compounds never before reported were described at the same meeting by George F. Lewenz of the Lewis Flight Propulsion Laboratory, National Advisory Committee for Aeronautics, Cleveland, and Kasper T. Serijan, Armour and Co., Chicago. An additional 22 new compounds of another series were prepared by this team, in a program to provide samples of known structure with which to compare chemicals to be identified in the future. The chemists described their methods of making these new additions to the aromatic series of organic compounds.

Warn of Smog Poisons

➤ DANGERS DUE to ordinary poisonous chemicals can now be detected by monitoring devices worn by workers exposed to them, just as atomic workers carry small instruments to detect radioactivity.

A new safety device for this purpose was described by Gordon D. Patterson, Jr., of Du Pont and Dr. Melvin G. Mellon of Purdue University, reporting their work on air pollution to the meeting.

Sulfur is the element blamed for smog and similar industrial fume problems. The indicator described by these chemicals turns yellow, green or blue according to the amount of sulfur compounds in the air. The colors appear in vanadate-silica gel which is packed into a glass tube. One of these tubes can be worn by each worker. Other tubes can be used to analyze stack gases.

An alternate detecting material, periodate-silica gel, also used in the new indicator tubes, changes from white to pink and then to red brown when there is sulfur dioxide in the air.

Science News Letter, April 5, 1952

More than 600 *children* a year, almost all under four years of age, lose their lives through accidental poisoning.

MEDICINE

Detection of Cancer

Catching enemy when invasion is still small and localized is important part of fight against cancer. Seven danger signals listed.

(Second of a series of five articles on what can be done about cancer)

By JANE STAFFORD

➤ DETECTING CANCER as early as possible is an important part of the fight against the disease. You can easily see why when you understand the nature of cancer. It is abnormal growth which invades and spreads not only into surrounding parts of the body but also to distant parts.

Obviously, the chance of victory, in this case cure, is better when the enemy is small and localized in just one place. It is important to remember, also, that this abnormal growth, invasion and spread can and often does go on at a very rapid pace.

Cancer detection is very much a two-way job. The patient cannot tell by himself that he has cancer. But the doctor cannot tell until the patient comes for examination. For the patient, man or woman, there are certain symptoms or signs that should be considered danger signals. These are:

1. Any sore that does not heal.
2. A lump or thickening in the breast or elsewhere.
3. Unusual bleeding or discharge.
4. Any change in a wart or mole.
5. Persistent indigestion or difficulty in swallowing.
6. Persistent hoarseness or cough.
7. Any change in normal bowel habits.

These signs do not mean that a person necessarily has cancer. But the person who has any one of them should see a doctor to find out what is wrong, whether cancer or some other condition, and have it corrected.

These seven danger signals, as they are called, are the most frequent first expression of the commonest kinds of cancer.

Many persons have been told that early cancer is painless, that they should not wait for pain to drive them to a doctor. The last half of this is true. The first half is not necessarily so. Even a very small cancer, if located close to certain nerve endings, may cause pain or at least some kind of sensation of something not quite right or comfortable. "Heaviness," "pricking," "tightness," "soreness," and similar kinds of sensations may be felt even if real pain is not. If this kind of sensation goes on for more than a few weeks and if it is localized enough so that a person can, literally, put a finger on the place, then it should be investigated carefully by the doctor.

Being alert to these various signs and sensations that may mean cancer are the lay person's part of the cancer-detecting job.

The doctor's part of the job starts with a careful history of how the patient feels, all his symptoms and the ailments he and his parents have had. Then comes examination and if the suspected cancer is inside the body where the doctor cannot see or feel it, X-ray examinations may be made

If cancer is still suspected, the doctor will probably want to clinch the diagnosis by a biopsy examination. This means examination under the microscope of material from the suspected cancer. This may be done by cutting out a piece from the edge of the growth, including a piece of normal tissue for comparison. Cutting out the piece of tissue is done painlessly with the aid of an anesthetic. The shape and arrangement of the cells, their organization and nucleus tell the expert who looks at them under the microscope whether or not they are from cancer.

In recent years a new microscopic test for diagnosing cancer has been developed. It is known as the smear test, the Papa or Pap test and the Papanicolaou test, because a scientist named Papanicolaou developed it. This test is based on the fact that cancers shed cells as trees shed leaves. These cells get into the body fluids of certain organs. Isolated lung cancer cells can be detected in the sputum and cells of cancer that has attacked the uterus can be detected in material smeared on a slide that is gently swept over tissues at the opening from the uterus. Cancer cells also have been found in stomach juice from patients with stomach cancer.

Since in this test the scientist must make his diagnosis on the basis of only a few cells, great skill and experience are required. A method that uses electronics to speed examination of material in this test has recently been developed and should make the test more widely available.

Because cancer often develops silently with very few symptoms in its early stages, many patients still are lost who could be saved by earlier diagnosis and treatment. In these cases it is not always the patient's delay or the doctor's that brings treatment too late. To help prevent this tragic loss of life, men and women who reach the age of 40 and 35 respectively are urged by many cancer authorities to have yearly or twice-yearly examinations by their doctors. The hope is that these men and women, who have reached the age when cancer most often attacks, will have their cancers detected in early, symptomless stages.

A cancer detection test that could be given as easily as the sugar test for diabetes

CONVERGING BEAM THERAPY—This artist's conception shows how the unique 50-gram radium treatment would work. The beams from 25 two-gram capsules converge on the patient's right kidney. The radium is so placed that the whole radiation amount is focused on the tumor site.

MEDICINE

Beams From 50 Grams of Radium Converge on Cancer

➤ A UNIQUE 50-gram radium treatment unit for cancer patients, one of two in the entire world, is going into operation at Roosevelt Hospital in New York.

The unit works on a new principle called converging-beam radium therapy. The 50 grams of radium are divided into 25 two-gram capsules of radium in the form of an insoluble sulfate salt. The 25 beams converge to give the patient increased effective radiation in deep-seated cancers with a minimum of skin damage as the gamma rays of the radium pass through the patient's body.

The structure for the unit was designed by Dr. Gioacchino Failla, physicist of Columbia University College of Physicians and Surgeons. Dr. Douglas Quick is director of the Roosevelt Hospital's new underground Henry Harrington Janeway Clinic where patients will be treated with the new unit.

The world's only other 50-gram radium unit is in the Institute of Cancer in Louvain, Belgium. The radium for the American unit has been loaned to Roosevelt Hospital by the Union Miniere du Haut Katanga of Brussels.

Science News Letter, April 5, 1952

is greatly wanted. Many blood tests for this purpose have been developed. So far none has stood up as practical for mass screening of large numbers of people, the way chest X-ray pictures can be used to detect unsuspected tuberculosis by mass screening. But these chest X-ray screenings, started as part of the fight against tuberculosis, are actually helping to find unsuspected cancer, too. Of course in these cases it is cancer of the lung that is detected.

Science News Letter, April 5, 1952

Next Week: New Recruits Aid Old Guard to Halt Cancer.

METEOROLOGY

Find Raindrop Size On Mt. Washington Peak

➤ A DIFFERENT kind of poll is being taken in New Hampshire, this one with the help of a lady's nylon stocking, some oil and confectioners' sugar.

Meteorologists stationed atop Mount Washington, Gorham, N. H., are using this bizarre equipment to measure the size of raindrops. It is important to know raindrop and snowflake sizes to evaluate theoretically the strength of the echoes from radar returned by sheets of rain or snow.

The stockings are slightly oiled and then dusted with confectioners' sugar. When raindrops fall on this screen they cut neat holes in the oil-sugar mixture which consistently are 20% to 25% larger than the diameters of the raindrops making them.

Science News Letter, April 5, 1952

MEDICINE

Cancer Pain Attacked

➤ PAIN, GREAT fear of cancer victims, is being attacked along with efforts to find remedies for the various kinds of cancer.

Dr. Stanley Cobb, neuropathologist at the Massachusetts General Hospital, Boston, recently discussed the psychological aspects of cancer and what having cancer does to a patient's mental and emotional outlook.

Fear of pain from cancer sometimes even delays early diagnosis of the dread disease.

The medical profession now has a battery of methods for combating pain in the cancer victim. Drugs, nerve and brain operations, alcohol injections, hypnosis and psychology are used.

Newest drug is Dromoran, more powerful and longer acting than morphine. It is almost a synthetic morphine. It can cause drug addiction, like morphine, and therefore is kept under control of the Federal narcotics act.

Another synthetic drug, hailed as the best of all back in 1948, is methadon. One advantage it has over the opiates is that it does not produce a false sense of well-being, or euphoria.

A wash of radioactive gold produces relief in certain kinds of cancer. When cancer spreads to the sac encasing the lungs, the sac becomes pimpled with many little new cancers. Enormous amounts of fluid form as a result. A wash of radioactive gold sloshing around between the lungs and the sac kills many of these little cancers, thus reducing the amounts of fluid.

Metapon is still another of the pain-relieving drugs. Like morphine, patients develop a tolerance to it, so it must be used judiciously.

When fear is eliminated, the pain is less. Methods used to teach mothers not to fear childbirth are being tried on cancer patients with some success.

The operation known as lobotomy, where the surgeon cuts the nerve connections with the front part of the brain, sometimes relieves the patient of worries about his pain. He still feels the pain, but it doesn't bother him any more.

Injecting alcohol into the nerves which carry the pain sensations from the cancer areas to the brain has helped in some cases. Also cutting the same nerves has been tried.

Science News Letter, April 5, 1952

INVENTION

Combine Pajama and Crib Sheet for Child

➤ A CHILD'S pajama and crib sheet have been combined into one unit. The inventor is Bessie Jane Auer, Ossining, N. Y., and she received patent number 2,589,596. An object of the invention is to provide complete covering at all times, regardless of the position the child assumes.

Science News Letter, April 5, 1952