

## TECHNOLOGY

# Make Radiation Measurer

A STAND-IN for the human body that can be used in experiments to determine the effects of radiation on vital body organs has been developed.

Called the "phantom" patient, it has the same mass density or atomic number as soft tissue, Frank Dreisinger, director of technical services of the Picker X-Ray Company, White Plains, N. Y., said.

This close imitation of the human body is said to make possible any number of investigations with X-rays and evaluations that would ordinarily require exposing humans to radiation.

The artificial stand-in human represents a section of the human body from the waist to the mid-thigh. Within this area, however, it has every bone structure of these regions: pelvis, thigh bones, sacrum and lower spine.

Now researchers have a "body" available

with known thicknesses and degrees of X-ray opacities. Tissue-absorption can be measured by placing an ionization detector in the mid-plane cavity in the "phantom's" body. Thus investigators will be able to determine how much radiation the organs in this area are receiving.

Formerly, the only method which could determine this same information was to open a human and place the detector inside.

The stand-in human will also enable makers of X-ray equipment and accessories to check their products and will enable doctors to study new techniques and products such as barium, tracing dyes, cassettes, or roentgenographic plate holders, film and film developing chemicals.

The "phantom" was developed by Alderson Research Laboratories, Inc., and is being distributed by Picker.

Science News Letter, June 13, 1959

ward into the outflow tract of the left ventricle" or pumping chamber of the heart. However, he pointed out that the development of satisfactory oxygenating pumps have made direct aortic valve surgery possible in some cases.

New evidence that hormone treatment intensifies blood vessel inflammation in rheumatoid arthritis patients was also presented to scientists attending the Congress.

Steroids are now the only known helpful treatment for reducing joint inflammation temporarily. Dr. J. Peter Kulka of Boston, Mass., explained they also tend to increase the pre-existing vessel inflammation.

Studies were made of some 12 rheumatoid arthritic patients.

Science News Letter, June 13, 1959

## SCIENCE NEWS LETTER

VOL. 75 JUNE 13, 1959 NO. 24

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., North 7-2255. Cable Address: SCIENSERV.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulation.



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## CHEMISTRY

# Fuel Cell Developed

AN IMPROVED FUEL CELL that produces electricity directly from oxygen and hydrogen has been developed.

The fuel cell generates electricity by means of a chemical reaction. In this cell, described by General Electric scientists, hydrogen and oxygen produce the electric current, giving water as a by-product.

The new device operates efficiently at room temperature and normal atmospheric pressure. Thermal efficiencies over 60% have been obtained.

"The fuel cell may find both civilian and military uses," Dr. Guy Suits, General Electric vice president and director of research, said, "despite the fact that it produces low-voltage direct current.

"We cannot yet determine how competitive it will be with other power sources," he said, "but its special characteristics may well fit it for a variety of uses . . . Military and space vehicle applications might make

use of the fuel cell's high reliability, simplicity, portability, light weight, and small volume."

The fuel cell consists of a round plastic disk about one-half inch thick and three inches in diameter. Its hollow interior is divided into two chambers by a special plastic membrane, which has an electrode in contact with each of its sides. Hydrogen is fed into one chamber, and oxygen into the other. At one electrode, the hydrogen molecules break up into electrons and positively charged hydrogen. The electrons travel through an external circuit to the other electrode, thus creating an electric current. The positively charged hydrogen moves through the membrane to the other electrode, where it combines with oxygen and the electrons from the external circuit to form water.

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## MEDICINE

# Study Spinal Arthritis

HEART DAMAGE and colitis may be important clues to a painful spinal disease.

Research reported at the Pan American Congress on Rheumatic Diseases meeting in Bethesda, Md., links "poker spine," or ankylosing spondylitis, an extreme form of a type of spinal arthritis, with damage to the aortic valve and to bowel inflammation.

Six cases of poker spine were discovered among 100 patients with ulcerative colitis, Drs. Nathan J. Zvaifler and W. Martel of Ann Arbor, Mich., said. X-rays of patients with this bowel condition should be carefully examined for the occasional case of

spinal arthritis that develops, they suggested.

The aortic valve which controls blood flow pumped by the heart to the main artery or aorta is uniquely affected in cases of poker spine (so called because it produces "a stiff, frozen back").

In this disease, Dr. Hugh A. Smythe of Toronto, Canada, explained, collagen, a soft supporting material of the body, is attacked.

In studying the heart in several cases of poker spine, Dr. Smythe found, "the whole valve mechanism is dilated and sags down-