

## MEDICINE

## Cancer of the Kidneys Diagnosed by New Method

► **CANCER** of the kidneys, bladder, prostate and other organs of the urinary tract may be diagnosed by a simple method recently developed for diagnosing cancer of the uterus, Dr. George N. Papanicolaou and Dr. Victor F. Marshall of Cornell University Medical College and New York Hospital, report in *Science*, (May 18).

The method depends on the fact that cancers of the uterus and of the urinary tract shed superficial cells which can be obtained for examination almost as easily as if the cancers were located on the outside of the body.

Of 83 cases in which this diagnostic method was tried, 27 were reported as positive for cancer. Of these 27, clinical diagnosis was positive in 21.

The method is simple, easy for the patient and inexpensive. If further study shows it lives up to its present promise, it might be valuable, the doctors point out, in periodic health examinations such as those conducted in public health clinics for detecting early or unsuspected cancer. It should also be useful in cases when repeated examinations are necessary to clear up an obscure diagnosis or to follow results of operations or other treatment.

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## PHYSICS-GENERAL SCIENCE

## Astronomer Offers Theory Linking Mind and Matter

► **A THEORY** which offers new light on many phenomena hitherto not explained, such as the relationship between mind and matter and the connection between the will and muscular activity, has recently been published by Dr. Gustaf Stromberg of the Mt. Wilson Observatory staff. (*Journal of the Franklin Institute*)

Dr. Stromberg's article, entitled *The Autonomous Field*, is an outgrowth of ideas from Einstein's general theory of relativity and modern wave mechanics, concepts which are now included in our present theory of the atom. From the popular point of view, the most interesting feature of the autonomous field theory is that it is applicable not merely to inanimate objects such as stars and radiation, but to living tissues as well—in particular, to the actual development of an embryo within the human body.

Of special interest also is the fact that the theory is in striking agreement with experimental results obtained by Dr. H. S. Burr of the Yale Medical School on the oscillations of electric fields surrounding plants and animals.

It was the desire to understand the organization in the living world and the origin of consciousness which first gave impulse to Dr. Stromberg's study.

"The autonomous field theory is applicable to both the organic and inorganic world," Dr. Stromberg stated. "The novel idea introduced by Faraday more than a century ago, that fields have properties of their own, is thus vindicated by recent developments in physics and biology, and can serve as a starting point for a deeper understanding of nature, including the workings of the human mind."

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## ENGINEERING-AERONAUTICS

## Glass Fiber Blankets Absorb Sound in Planes

► **SOUND** insulation on multi-engined bombers is accomplished with blankets composed of down-like glass fibers as thin as five hundred-thousandths of an inch in diameter, reported Willis M. Rees and Robert B. Taylor of Fiberglas Research Laboratories at the meeting of the Society of Motion Picture Engineers. These blankets, weighing 2½ ounces to the square foot will be the basis for products that will meet the sound-control requirements of motion picture, television and radio industries after the war, they predicted.

Friction of pulsating air molecules against the walls of crevices in porous materials dissipates sound energy into heat, and it is in this way that most sound absorption is provided, Mr. Rees pointed out. Within limitations, the greater surface area provided by these crevice walls, the greater the sound absorption. There is a great increase in the total surface area of a pound of glass fiber as the fiber diameter decreases.

"Further research may demonstrate that acoustical values are functions of the fiber diameter and of the surface area of the fibers that make up the material," Mr. Rees stated.

He pointed out that glass fiber materials provide a group of non-burning products apparently subject to more complete control than has ever been possible in acoustical research, although there are not enough data at present on which to base scientific conclusions.

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# IN SCIENCE

## ASTRONOMY

## May 4 Meteoric Fireball Burst Near Chester, Pa.

► **THE FIREBALL** seen in the early morning hours of May 4 burst southwest of Philadelphia, probably near Chester, at a low altitude, preliminary study of nearly a hundred reports sent in by newspaper readers indicates to Dr. Charles P. Olivier, director of the Flower Observatory, who is president of the American Meteor Society.

Reports from housewives, workers on night shifts, invalids, policemen and others who were awake at 3:30 a.m. when the meteor plunged earthward were collected through the cooperation of newspapers publishing Science Service dispatches.

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## CHEMISTRY

## Diatomaceous Earth Used In Filtering Water

► **DIATOMACEOUS** earth will be used to filter water in all new purification units shipped to the armed forces in the Pacific as a result of tests conducted by the Engineer Board, Fort Belvoir, Va. The new filter, experiments showed, not only removes the cysts of amoebic dysentery but also filters out the blood flukes prevalent in Philippine waters.

Another improvement featured by the new purification units is the glass-fiber tank which, coated with Buna S rubber, replaces the old canvas type. It will not mildew and is little affected by climatic changes. Whereas the canvas tank loses a considerable quantity of water before the fibers swell to waterproof proportions, the new type is waterproof and fills at once.

It is presumed that U. S. troops going directly to the Pacific field from Europe will take their old-style purification units with them, and plans are being made to equip them with the newer type. The procurement division has ordered several thousand of the new units of 15 and 50 gallons per minute capacity. There are now in the field about 20,000 of the small, half-gallon per minute units.

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# CE FIELDS

## AERONAUTICS

### Army's C-82 Cruises At 200-Miles-an-Hour

► THE ARMY'S newest twin-engine air cargo transport, the C-82 "Packet," can cruise through the air at 200 miles an hour, 20 miles an hour faster than was expected, flight tests at Hagerstown, Md., and Miami, Fla., reveal. It can fly as high as 22,000 feet on two engines, or to 8,000 feet on a single engine with a full load. The plane could fly non-stop from New York to Los Angeles and part of the way back if necessary, since it has a maximum range of 4,000 miles.

Powered by two Pratt and Whitney 2,100 horsepower engines, the Packet can carry 18,000 pounds of cargo on a 500-mile trip or 13,000 pounds on a trip of 1,500 miles. It is expected that 1,500 miles will be about the longest single hop that cargo planes will be called on to make in practical use on overland air routes.

Built by Fairchild Aircraft, the C-82 shoots up at a steep slant in take-off. After a run of 800 feet from a dead stop, it clears the ground and gains more than 50 feet of altitude in the next 1,800 feet.

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## CHEMISTRY

### Study of Biogeochemistry Undertaken by Museum

► A THREE-year preliminary survey of biogeochemistry has been initiated under the auspices of the American Museum of Natural History. In charge of the work will be Prof. G. Evelyn Hutchinson of Yale University; associated with him are Prof. Paul F. Kerr of Columbia University, Prof. W. A. Albrecht of the University of Missouri, Dr. Martin D. Kamen of the University of California, and Prof. Edward J. Conway of University College, Dublin.

Biogeochemistry is the investigation of the effects of earth chemicals of various regions on the life of plants, animals and human beings that inhabit them. Everyone has heard of such isolated instances as prevalence of goiter in areas lacking in iodine, of mottled teeth where there is too much fluorine in the water, of sick and crippled farm animals in regions

where the soil contains an excess of selenium. Oceanographers make chemical analyses of water from all the earth's oceans and seas as a matter of routine; but with the exception of pioneer work done some time ago in Russia by the late W. I. Vernadsky nothing comparable has been done for the chemistry of the land areas.

The present survey will undertake to assemble and evaluate all obtainable existing data, as well as to initiate new researches in fields where results appear promising.

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## PHOTOGRAPHY

### Simple Paint-brush Method For Applying Emulsions

► A NEW simple paintbrush method of applying photographic gelatin-silver-halide emulsions to metal sheets, so that patterns can be photographed on the metal to guide workers in building airplanes, has been described by Faurest Davis of Ansco. Although there are several methods now in use, including silk screen and stencil devices, the photographic method of transferring engineering drawings to the work itself by photographic means has proved highly satisfactory in a number of aircraft plants.

The process described by Mr. Davis begins with heating a bulk emulsion gel to a temperature of 110 degrees Fahrenheit in a double boiler or water jacket. These and other operations must be carried out in a darkroom, under proper safelight conditions. A homogenizer or stirrer with stainless steel fittings, running at 5,000 revolutions a minute, is next used to blend glycol-monobutyl-ether with the liquefied emulsion. The substance acts as a gelatin leveling agent. After about two minutes of stirring, considerable foaming occurs and a few drops of another substance are added to prevent air bubbles. The mixture is then ready to be spread on the metal. Materials to be sensitized are usually coated with a flat white lacquer free of sulfides and other contaminants, and heated to about 100 degrees Fahrenheit to allow the emulsion to level out before becoming stiff.

The warm, liquefied emulsion is applied with a soft paintbrush. Up to 1500 square feet can be covered with a gallon of the mixture. This brings the cost of the sensitizing material down to about one cent a square foot.

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## CHEMISTRY

### X-rays Now Used to Make Chemical Analysis

► CHEMICAL analysis of gases, liquids and solids by shooting a beam of X-rays through them, is a new and rapid means of identifying the chemical elements in the material, developed by Dr. Herman A. Liebhafsky and Dr. E. H. Winslow in the General Electric research laboratory. Another scientist in the laboratory, H. Millard Smith, has found a practical way of measuring the X-ray absorption, on which the new method depends, by a photoelectric X-ray intensity meter.

X-rays are intimately related to the inner atom, so they furnish a means of counting the numbers and indicating the kinds of atoms by which they are absorbed. The count is unaffected by whether the atoms are free or have combined to form molecules of any sort whatsoever. An oxygen atom, Dr. Liebhafsky explains, will have the same absorption for X-rays, whether it is free or in the oxygen molecule, or in liquid water, ice or steam, or in sugar or in sand.

In the X-ray absorption method developed by Mr. Smith, the invisible rays fall on fluorescent material which becomes luminous where they strike. This material, called a phosphor, is painted on the glass envelope of a phototube of the multiplier type.

With such a tube the light from the phosphor falls first on a sensitized surface within the tube, and electrons are emitted from it. These electrons are multiplied by electronic amplifiers, producing a current that can be measured.

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## CHEMISTRY

### Fumes Endanger Health In Silver Soldering

► FUMES given off in silver soldering contained such a high concentration of cadmium that exhaust ventilation was installed in a Kansas City silver manufacturing plant to protect the health of the workers by collecting the fumes at their source.

Analysis of a solder sample revealed it was 18% cadmium, while further investigation showed that silver solders sometimes contain as high as 70% cadmium. The plant laboratory, upon recommendation of the Industrial Hygiene Service, is trying to develop a satisfactory solder not containing cadmium.

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