

SCIENCE NEWS

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STEREOSCOPIC X-RAY DEVICE

A STEREOFLUOROSCOPE x-ray instrument that shows the inner workings of the human body as though it were a moving picture has been perfected at the California Institute of Technology and will be installed in the Henry Phipps Institute at Philadelphia, where practical medical experiments are to be conducted. Several months ago a rough experimental model was completed and caused great interest when introduced to the medical world. When it proved a success funds were secured from the Rockefeller Foundation for construction of a more elaborate instrument designed for use in hospitals.

The instrument was developed by Dr. Jeffe W. M. Dumont, research fellow in physics, Dr. Archer Hoyt, teaching fellow in physics, and Clarence Brandmyer, at the California Institute of Technology. Dr. Hoyt has left Pasadena to become an instructor at Cornell. These men worked out the details of the instrument, which was built during the last three months at the institute.

An announcement inviting the public to view the instrument reveals that the instrument consists of two x-ray tubes connected to a single transformer so that they are alternately caused to emit x-rays by alternations of a fifty-cycle alternating current. The alternate x-ray impulses emitted by the tubes project alternate shadow pictures of the object to be viewed on a single fluorescent screen. Since tubes are spaced apart at approximately the same distance as the distance between the two eyes, the shadow pictures projected on the screen differ slightly in the point of view in the same way that two images in the right and left eye differ respectively from each other when the eyes view any object in three dimensions.

To give the impression of a three-dimensional stereoscopic plastic relief, it is only necessary to arrange that each eye shall see one and only one of the two images formed by the two tubes. This is accomplished by means of a special rotating shutter placed before the eyes and driven by a synchronized motor in such a way that the right eye looks at the time the right-hand x-ray tube is emitting rays and the left eye looks at the time the left tube is emitting.

By observing certain geometrical relationships between parts it is possible to have the stereoscopic image appear in space in front of the screen as an exact scale reproduction. Calipers are provided that can be introduced into the image and brought into apparent contact with any two parts of the image whose separation or size is desired. Scale measurements on the inside of the human body can be made in height, breadth or depth, or, in fact, any direction whatever.

AMERICAN HOSPITAL STANDARDS

THE financial depression has not affected hospital standards, it appears from the report of Dr. Franklin A. Martin, director-general of the American College of Surgeons, at the opening session of the twenty-first

annual clinical congress of the college in New York City. More hospitals than ever before have this year met the high standards for personnel, management and equipment required by the college for a place on its list of approved institutions for the care of the sick. Of 3,319 hospitals surveyed in the United States and Canada, 2,158 won the official approval of the college. Sixty-six cancer clinics in general hospitals and medical services in eighty industries have also been approved by the American College of Surgeons, it was announced.

"The economic crisis seems to have acted as a challenge to these hospitals to keep their standards higher than ever in order to give safe care for the many persons needing medical aid in times of financial stress," said Dr. Martin. "The increase in the number of sick has placed a heavy burden upon approved hospitals, but they have borne it splendidly. This, I feel, has been due in part to the fact that the minimum standards which they must meet are based on sound economic principles."

The public must be educated to an appreciation of the great achievements of modern medicine, so that it may discriminate between reputable physicians and irregular practitioners of medicine, according to Dr. Allen B. Kanavel, of Chicago, president of the college and professor of surgery at Northwestern University Medical School. At present the public attributes any attack by physicians upon other forms of medical practice to jealousy and factional discord. "There are so many chiropractors, naturopaths, cancer quacks, faith healers, osteopaths, electropaths, Chinese herbalists, bonesetters, electric belt adherents, buckeye specialists, to say nothing of Lydia Pinkhams and devotees of patent medicine, that the trained physician must almost wear spurs on his elbows," declared Dr. Kanavel.

"Legal restriction can go no faster than public education," he said in discussing the situation. "We have had an example of this in our recent attempt to control by law the sale of intoxicants. We must therefore disabuse our minds of the vain hope of quick results and depend upon general education of the people." He urged hospitals to give intensive study to the possibility of reducing at least part of their charges, in order to meet the present public resentment at these items of medical care. The public's criticism is apt to be unjust, he admitted, because the public forgets the increased cost of service in all phases of economic life and is ignorant of such necessary adjuncts to hospital service as chemical and x-ray laboratories and social service and free beds. He also suggested that the private patient be freed from the overcharge incidental to the care of free patients and that the latter be supported exclusively by endowments.

Hospital physicians need to give more thought to the training of the internes, Dr. C. Jeff Miller, of New Orleans, retiring president of the college, urged. First-year internes should not be permitted to do surgery, independently, even under the strictest supervision, Dr.

Miller stated, but should be taught "not only the mechanical and material side of medical practice but the ethics of their calling and the ideals of their art. . . . It would profit us to remember that the internes we are training to-day are the physicians and surgeons of tomorrow. We can not take too deeply to heart the heavy responsibility that lies upon us for the type of practitioner they are going to become," he concluded.

RADIOACTIVE WATERS

WARNING against the use of radioactive waters and radium emanators, frequently promoted for the cure of a great variety of diseases and ailments, was contained in a report by Dr. Harrison S. Martland, medical examiner of Essex County, and physician at the City Hospital, Newark, N. J., to the *American Journal of Cancer Research* made public recently.

From long study of the effects of radium poisoning in the luminous watch dial painters, Dr. Martland has concluded that it is dangerous to increase the normal radioactivity of the human body, on the strong presumption that increased amounts of radioactivity over a number of years may produce cancer. "The drinking over long periods of time of radioactive waters containing radon may allow a small amount of active, long-lived deposit to enter the body, part of which may finally be deposited in the bones and other organs as more or less insoluble salts," he stated. Such deposits of insoluble salts of radium and other radioactive substances were responsible for the development of fatal cancer (sarcoma) in the watch dial painters, Dr. Martland showed in the report.

Some of the radioactive waters for sale, when taken according to directions of the promoters, would mean that there would be swallowed each day an amount of radioactive substance equal to that taken by some of the dial painters, he found. These substances are in soluble form in the water, but they are changed in the blood to the more insoluble carbonates, phosphates and even sulphates of radium and mesothorium and eventually reach the bones. Once deposited there in insoluble form, there is no way known now to eliminate them from the body or to protect it from their fatal bombardment of alpha particles, with the exception, possibly, of methods of treatment similar to those used in the treatment of chronic lead poisoning. Radium emanators and the waters of natural radioactive springs were objected to by Dr. Martland on the same grounds.

SCHOOL VENTILATING SYSTEMS

MORE than \$2,500,000 is being wasted annually by many cities throughout the country on unnecessary and even hazardous ventilating systems for schools, Dr. C.-E. A. Winslow, professor of public health at Yale University, estimated in a report published on October 19 by the New York Commission on Ventilation, of which Dr. Winslow is chairman.

Twenty states in the Union still have laws or other regulations concerning ventilating devices which are based on disproved or antiquated theories, the commission found, although scientific knowledge concerning the proper ventilation of buildings has been in the possession

of architects, hygienists and engineers for more than twenty-five years. For example, these twenty states require that there be an air supply of thirty cubic feet per minute per person, a condition which can only be obtained by mechanical ventilation involving the use of fans. This system is not only costly, but may in some circumstances be a menace to health, the commission reported, since it tends to produce drafts and overheating.

The evidence gathered during the investigation all showed unmistakably that the window-gravity method of ventilation, in the absence of specific unfavorable conditions, is generally more satisfactory than the fan system because it maintains more uniform temperature, humidity and air movement. Among other things the commission recommended maintenance of a room temperature of 65 degrees Fahrenheit in corridors, gymnasiums and shops; of 75 degrees in swimming pools and adjacent dressing rooms; and of 68 degrees in all other occupied rooms.

"The avoidance of overheating is of primary importance for the promotion of comfort and efficiency and the maintenance of resistance against disease," the report stated. "All classrooms shall have at least fifteen square feet of floor space and two hundred cubic feet of air space per pupil," was another recommendation for a model ventilation law. An accurate thermometer for each class, study, assembly and physical recreation room was a third recommendation.

"Existing ventilation regulations should be replaced by laws outlining the major objectives of schoolroom ventilation and delegating to some small expert official body the power to determine whether specific plans for school ventilation are adequate to attain these objectives," the report concluded.

ARTHRITIS

"MARKED improvement or even cure" in three fourths of all cases of arthritis, commonly called rheumatism, may be expected from modern methods of diagnosis and treatment of this ancient and wide-spread disease, Dr. Ralph Pemberton, associate professor of medicine at the Graduate School of the University of Pennsylvania, declared in a radio talk over station WCBS in New York City. Dr. Pemberton's talk was a part of the clinical congress of the American College of Surgeons.

"The word arthritis means inflammation of a joint and forms part of the larger topic of rheumatism in general," Dr. Pemberton explained. "Rheumatism can be divided into acute rheumatic fever and various sub-acute or chronic forms, of which arthritis is the chief example. Acute rheumatic fever chiefly affects young people and may damage the heart. It is a serious disease if not cared for, and requires long rest in bed, but it is not a great sociologic burden. Arthritis and chronic rheumatism, however, in their several forms constitute perhaps the greatest single economic burden which society bears and have been the cause of untold misery," he said.

Among the causes of arthritis Dr. Pemberton listed hereditary tendencies, poor bodily make-up, over-fatigue, focal infections, faulty food habits and improper func-

tion of the digestive system. Women are affected about twice as often as men. "Treatment of arthritis, to be successful, must begin with a correct diagnosis of the type of the disease and must include an open-minded outlook on the many factors which produce it," Dr. Pemberton stated. "It is too frequently the custom to-day merely to give aspirin to the person affected and to treat the matter lightly. This is wholly wrong."

Dr. Pemberton stressed the need of rest in arthritis, saying that it is almost essential to any and all treatment. By this he meant complete bodily rest for several hours each day, often including confinement to bed. "Every arthritic should realize that the statistical possibilities of benefit are definitely in his favor under the best conditions of modern treatment and neither he nor his physician should cease until the maximum benefit is obtained. There are few chronic diseases for which more can be done," he concluded.

ITEMS

THE need for seeking early treatment in cancer of the stomach was stressed by Dr. Donald C. Balfour, of the Mayo Clinic, Rochester, Minnesota, at the recent meeting of the American College of Surgeons, in New York. In spite of the fact that this disease is curable when seen in the early stages, not even an attempt at cure can be made in three fourths of the cases when the patients are first seen, Dr. Balfour said. He reported a study of the case histories of 128 patients on whom an operation for this condition was done and who lived for ten years or more following the operation. The death rate in this operation when performed under good conditions is about 10 per cent., which is not high, considering that otherwise an early and distressing death is inevitable, Dr. Balfour pointed out.

THE director may shout and the camera grind loudly, but only the desired music and the voices of the actors will be heard in the talking movies being filmed, if the noisy director and camera are in the plane of zero reception of a new type of microphone that has been developed recently. The pressure type of microphone now in use in recording sound pictures has practically no sense of sound direction, picking up all sounds promiscuously. The result is that objectionable noises, such as those produced by the grinding of the camera, often cause great worry and inconvenience in making a talking film. But the new instrument, known as a ribbon microphone, has a marked directional characteristic.

"THE American College of Surgeons regards the education of the public as to scientific medicine an official duty and your personal obligation," Dr. Allen B. Kanavel, of Chicago, president of the college, told the newly initiated fellows of the college at its closing session in New York. "Charlatanism is not a modern evil," he said, in reviewing activities of the college to elevate the standards of surgical practice. "In the seventeenth century quacks pretended to remove stones from the head to cure insanity."

WORKING in an observatory in Cape Town, an astronomer has just learned the latest news concerning an explosion that occurred nearly 2,200 years ago, when ancient Carthage was at its height. The astronomer is Dr. H. Spencer Jones, His Majesty's astronomer at the Cape, and the explosion was in a star in the constellation of Pictor, the painter, which can not be seen from northern latitudes. So distant is the star, according to Dr. Jones' calculations, that its light takes about 2,173 years to reach the earth, so that the first word of this ancient explosion arrived in 1925, when a bright star was suddenly noticed where a faint one had been seen before.

BIRDS broke into the talkies, recently, in Detroit, Michigan, when Arthur R. Brand, of Cornell University, presented before the meeting of the American Ornithologists' Union a film, "illustrated" with sound, of a number of singing birds which he had successfully stalked with motion picture camera and sound recorder. This was a climax of a great display of bird movies, showing a total of nearly six miles of film before the largest gathering of American and Canadian ornithologists that has ever been assembled in one place.

THE sow-and-reap method so common to agriculture is on trial in the oyster industry. A company operating at Padilla Bay on Puget Sound will plant seed oysters from Japan about the first of each year and harvest them the following fall. Fifty million oysters are now growing in the Padilla beds and will be ready for cock-tails before long. Care will be taken not to let the oysters reach the gigantic, "beefsteak" size they would if allowed to attain their full growth.

AN apparatus that measures the temperatures preferred by cockroaches shows that the drier they are the cooler they like to be. In moist air they are content to be a little warmer. Cockroaches lose about 9 per cent. of their body weight a day, when they are in dry air at 86 degrees Fahrenheit. In four days they die. D. L. Gunn, zoologist at the University of Birmingham, has made these experiments. A German scientist found that beetles react in a similar way.

HARDENED metals become still harder if they are put in a rotating magnetic field. In a report to the American Society for Steel Treatment, Mr. C. H. Desch explained that the results obtained from this new method are of practical value. Not only are metals like iron and steel affected in this way, Mr. Desch pointed out, but those such as brass and duralumin as well. In an experiment with duralumin the degree of hardness normally attained in thirty-four hours was reached by the magnetic method in twelve hours. Working tools may be so treated, too, no matter how complicated their form. The effect of a magnetic field in hardening metals was discovered by the English metallurgist, E. G. Herbert.