

related these with the age of the unborn babies.

In cases where the head is deformed or cannot be measured by X-ray methods before birth, the length of the thigh is used to determine age. This measurement is possible as a result of research by Dr. Ruth Stocking in Dr. Hodges' laboratory. Dr. Stocking worked out a way of calculating the length of the thigh from measurement of the length of the shaft, since this is all that shows in X-ray pictures of unborn babies, the ends of whose thigh bones are not developed enough to show in X-ray pictures.

Knowing the age of the unborn child, the physician can tell not only when the child will be born, but also whether or not the child will be born alive. If the age based on the mother's record is 35 weeks, for example, and the age determined from X-ray measurements is only 25 weeks, it indicates that the child is dead.

Physicians have used other methods of determining these important facts about mothers and unborn babies, but the X-ray methods are more and more in demand, Dr. Hodges pointed out.

Science News Letter, October 10, 1936

MEDICINE

Tuberculosis Methods May Be Useful With Arthritis

SOME of the methods used in treating tuberculosis may in future be applied to treating arthritis, although the two diseases are not related, Dr. Robert M. Stecher of Western Reserve University told the meeting. He showed photographs and X-ray pictures of dozens of pairs of hands afflicted with various types of arthritis.

This exhibit looked like a fortune-teller's nightmare, except that the pictures show the backs instead of the palms of the hands. The photographs show the swellings, deformities, and crippling of the hands and the X-ray pictures show the underlying destruction of bones and joints. Some of the hands were crippled and painful and the bones roughened and worn away by infections, among them gonorrhea.

In these infectious conditions, fever treatment by the Kettering machine for inducing very high temperature in the patient is helpful.

In another type of arthritis the cause is not so well known. In these cases, Dr. Stecher pointed out, the patient is sick and not merely having trouble with his hands, though his general sickness

is not always considered in treating his arthritis. For such patients Dr. Stecher believes the treatment should be modelled after methods used in tuberculosis. The patient should be put to bed, given plenty of food and sunshine. It might help him to be sent west where the climate is dry and even. Too often, these patients insist on going to work and carrying on as many activities as their painful or crippled joints will allow.

Science News Letter, October 10, 1936

GENERAL SCIENCE

Scientific Methods Essential To Solution of Problems

THE future of mankind depends on man's learning to use the method the scientist uses in solving his problems.

This was the message of physics to medical X-ray science as conveyed by Prof. Robert A. Millikan, California Institute of Technology head and noted cosmic ray investigator, to the meeting of the American Roentgen Ray Society.

"Man must learn the scientific mode of approach before he will ever solve the worst of his social or governmental ills," Prof. Millikan declared.

The method of science, Prof. Millikan explained, is always to utilize the knowledge of the past as a platform from which to make advances into the future. In every single case the scientist starts with the accumulated knowledge of the past and pushes a little further along, and then from this slightly advanced platform builds still a little further, and so on and on, always pushing ahead from the last platform of all past knowledge.

Prof. Millikan sketched briefly the way in which this scientific method of approach was used in exploring the field of electromagnetic radiation from X-rays and ultraviolet rays to cosmic rays. The knowledge gained in this field is of tremendous importance and usefulness, but the method by which it was gained is even more important, Prof. Millikan emphasized.

He declared that this scientific method of approach is "vastly more important for the future of the race than any particular bread-and-butter application in the whole field of radiation, no matter how important that field as shown by the fact that enormous industries—the whole communications industry and sound pictures, for example—have come out of it."

Prof. Millikan surveyed the field of radiation and described the ranges of particular interest to medical men. Among these is the whole range of

X-ray and gamma ray frequency, the main use of which is "combating mankind's most terrible scourge, cancer." This runs from a frequency in electron volts of about 12,000 up to 1,200,000 electron volts, which is the highest frequency which has been generated by an X-ray tube and used continuously for cancer treatment.

These high potential X-rays are particularly appropriate for deep-seated cancers, Prof. Millikan reminded the doctors, the low potential tubes being successfully used to treat superficial cancers.

"It is not too much to say," Prof. Millikan continued, "that the best of medical authorities agree that radiation is the most potent agent we now have for combatting the scourge of cancer, not even excepting surgery."

Science News Letter, October 10, 1936

ROENTGENOLOGY

Doctors Warned of Danger In Use of Diagnosis Aid

Possible danger in the use of thorostrast, a radioactive substance, in diagnosis was pointed out by Dr. Robert B. Taft of Charleston, S. C. Thorostrast is injected to make visible on X-ray pictures parts of the body that could not otherwise be seen and thus helps the physician detect disease conditions. Because its radioactivity is slight it is considered harmless to the patient and so far no adverse effects have been reported.

Dr. Taft devised a method of determining the radioactivity of one dose of thorostrast in the patient's body and found it gives off gamma rays equivalent to 1.37 micrograms of radium. Small as this may seem, it is the amount found in the bodies of the girls who died of radium poisoning contracted when they painted radium on watch dials. Dr. Taft, in making his preliminary report, said he expected to continue his studies but he feels the evidence already obtained shows that those who use thorostrast are on "dangerous ground."

Science News Letter, October 10, 1936

ROENTGENOLOGY

New Type X-Ray Camera For Analysis of Movement

FIRST use in the United States of a new kind of X-ray camera called the kymograph was reported by Drs. Wendell G. Scott and Sherwood Moore of

Washington University School of Medicine, St. Louis, to the meeting.

With this machine physicians will be able to analyze the complex movements involved in breathing and get a better idea of what is wrong in various diseases of the chest such as pneumonia, tuberculosis, cysts, abscesses and tumors of the lungs and even some abdominal disorders. Kymograph pictures are taken through a lead grid arrangement which gives an effect equivalent to a photograph of a garden through a picket fence.

Kymograph pictures look like badly blurred films because they are long exposures and the movements of breathing cause the blurs. The grid arrangement, however, throws lines on the film which are used to measure the amount of blurring and thus the amount of movement. The movements are made by the lungs, diaphragm, heart and spine during breathing. When disease causes a change in any of these movements, the kymograph records it and thus helps the physician diagnose the condition.

Science News Letter, October 10, 1936

A young woman astronomer at the Harvard Observatory, Miss Henrietta Swope, reported on the behavior of one of the strangest stars ever studied in the sky. Until about 1928, it was a "steady" star, but then it turned into what is called a Cepheid variable, increasing and decreasing its brilliancy at regular intervals. There are many variable stars of this type, but none like this one; for in the first place no star has ever been known to change from a steady, to a variable before, and in the second place no Cepheid variable has ever been known to change its period. And Miss Swope's unique star has done just that. In 1928, when it first began "acting up," its period from bright through dim and back to bright again was fourteen days. Now it is twenty-one. Nobody has any explanation for this strange behavior.

Miss Swope is a daughter of Gerald Swope of the General Electric Company.

Science News Letter, October 10, 1936

GEOLOGY

Earth Gains Pound an Hour On Diet of Shooting Stars

OLD Mother Earth is putting on weight at the rate of nearly a pound an hour, on a diet consisting of stone and iron. She makes no secret of it either, for at least the larger mouthfuls are signalled by shooting stars.

How fast the earth receives new matter from interstellar space was worked out from the reports presented by Dr. F. G. Watson and Dr. J. L. Greenstein, both of Harvard College Observatory, to the American Astronomical Society.

Dr. Watson made a special study of the rate of fall of what might be called micro-meteors, which are bits of cosmic dust gathered in by the earth as it speeds through space, but which are so small that they do not make the brilliant flashes that mark the capture of their larger brethren, the meteors or shooting stars.

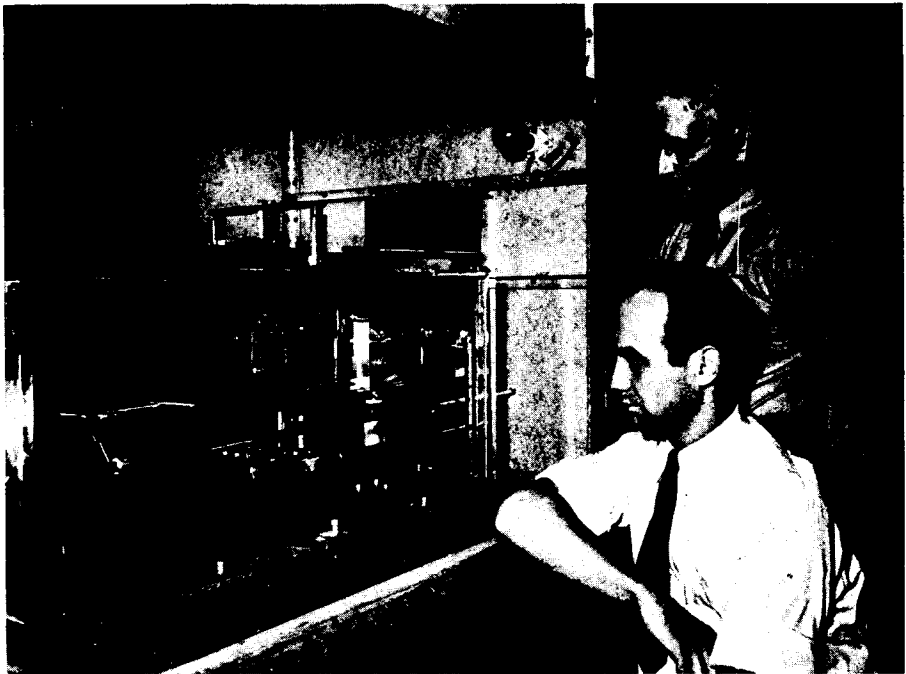
The brilliant shooting stars on which young people "make a wish" are caused by the evaporation in the high upper atmosphere of bits of stone or iron, the biggest about the size of a pinhead. Dr. Watson's micro-meteors are much smaller than that, the smallest detected with his special instruments being about a hundredth of a millimeter in diameter. That is about the size of a yeast cell, or a good, fat, outsize germ.

Dr. Watson's studies showed that every day the earth's atmosphere receives approximately one hundred thousand million meteors and micro-meteors. Their total mass comes to an estimated ten kilograms daily. A kilogram is a little over two pounds, so that the hourly rate is somewhere around one pound.

Dr. Greenstein conducted his research on similar drifting solid particles as

they exist in the far interstellar spaces, for they seem to be everywhere in the astronomically explorable universe. Particularly thick masses of them cut off light from distant stars, making the dark nebulae, or "coal sacks," that have proved so puzzling to astronomers.

Most babies are well when they are born, says the United States Children's Bureau.



STUDY OIL FILMS

Oil films so thin that a mere ounce of oil would cover a 15- to 20-acre pond have been produced with this new polymolecular apparatus devised by Dr. W. D. Harkins (standing) and Dr. Robert J. Myers (sitting) of the University of Chicago. These chemists have discovered that the molecules that make up films can stand on end. Or they can lie over more and take up more room. Or they can lie down completely. "Lying-down" molecules of an ounce of oil will cover the 15 to 20 acres, while the upright molecular films will cover only 3½ acres of water surface. The experiments are expected to throw new light on the films for lubrication and other uses. (See SNL, Sept. 19.)