reaction to the rays as they pass through to the cancer in the patient's throat.

This same redness is produced by X-rays and, as you know, by the ultraviolet rays of the sun. An important and hopeful difference between X-rays and neutron rays for cancer treatment is in their quality. As an example, Prof. Lawrence explained that physicians cannot safely give much more of an X-ray dosage than will just produce this skin reddening, but considerably more than the skin reddening dosage of neutron rays can be safely given. Perhaps this difference will make all the difference needed for cure of cancer.

Science News Letter, May 13, 1939

CHEMISTRY

Plasticized Sulfur Now Serving as Road-Binder

PLASTICIZED sulfur, first cousin to the elemental material from which potent industrial chemicals such as sulfuric acid is made, is finding its way into industry as a binder for brick roads, glass skylights and parts of washing machine tubs, as well as in wood to prevent swelling from water, and in other fields.

These new uses are the result of laboratory research conducted at the Mellon Institute in Pittsburgh, the institute, one of the largest industrial research foundations in the world, announced in its annual report, published in *Industrial and Engineering Chemistry*.

The institute spent $1,104,405 during the year ended last March 1 in furthering research carried out through 86 fellowships, according to the report.

An improved raw material for ceramic products; a superior and safer dry cleaning solvent to replace dangerous explosive "Stoddard solvent"; cheap paper X-ray plates, useful for sorting out tuberculars from healthy people in early diagnosis; and synthetic oils for lubricating watches are among the new products now announced in the report. Discoveries previously reported—such as the promising quinine-derivative treatment for pneumonia and a special treatment for rapid tenderization of meat—are also set forth among the Mellon foundation's accomplishments.

The institute has generally broadened out its work recently, the report points out. "Especially prominent among the institute's recent undertakings has been the inception of researches along a broader front for greater service to science, industry and humanity."

Science News Letter, May 13, 1939

AERONAUTICS

New Wing Design Promises 500-Mile-an-Hour Speeds

Product of National Advisory Council for Aeronautics Laboratory at Langley Field Hailed as Major Contribution

A NEW TYPE of wing, which makes possible a considerable increase in airplane speeds was announced as the outstanding contribution of the National Advisory Committee for Aeronautics to aviation this year. With other developments, it brings the 500-mile-an-hour airplane within range of the next year or two.

It was developed by a team of half-a-dozen or more staff members of the N.A.C.A. at its Langley Memorial Aeronautical Laboratory during the past year. Worth untold millions to national defense, commercial aviation and private flying, it means not only that high speeds can be gained with the same size of engine, but also that equal speeds are attainable with smaller engines and less fuel—in other words, less money.

Control of the boundary layer of air closest to the skin of the wing, one of the most baffling problems hitherto faced by the science of aerodynamics, has been achieved in the new wing, whose speed-killing and power-consuming drag is thus reduced, Dr. George W. Lewis, the Committee's research director explained.

In conventional wings, the boundary layer close to the leading edge soon becomes turbulent and as a result slows the wing and the entire plane. The transition point between smooth and turbulent air has been moved back on the new wing to a point nearly two-thirds the distance from leading to trailing edge. This is gained by altering the shape of the conventional type of wing, Dr. Lewis said.

No gadgets of any kind are used. At the same time, Venetian blind flaps and some other high lift devices can be adapted for use with it.

No further information concerning the wing, either descriptive or concerning its performance, is available, for it will remain for the time being a closely guarded military secret.

In importance, the conservatively inclined Dr. Lewis rated it with the N.A.C.A. cowling which, ten years ago, added 20 or 25 miles an hour to the speed of every airplane using a radial engine by reducing the drag of the motors' projecting air-cooled cylinders.

Science News Letter, May 13, 1939

PSYCHOLOGY

Father's Favorite Child Finds Life Worth Living

THE CHILD who is Father's favorite, whether boy or girl, faces a life worth living, Dr. Ross Stagner, of the University of Akron, told the meeting of the Eastern Psychological Association in Bryn Mawr. But being Mother's favorite does not insure such a happy lot.

Intimate revelations from more than 150 boys and girls aged 18 to 25, collected for Dr. Stagner by Dr. Maurice Krout, of Chicago City Junior Colleges, showed how parents mold the personality of youth.

Girls who are Father's favorite daydream often. Boys who are Mother's favorite are forgetful.

When Father prefers a son, the sister is likely to have feelings of suffocation. When Mother prefers a son, however, sister is suspicious of others.

Boys whose fathers prefer a daughter believe they have enemies. Boys, so rejected by their mothers, may report an unreasoning impulsion to take things.

Boys whose fathers are distant toward them may have thoughts of suicide; if their mothers are distant, they are more likely to develop neurotic pains and dizzy spells.

Girls kept distant by their fathers often report feelings of suffocation, dizzy spells and headaches. Kept distant by

their mothers, they have difficulty in expressing affection, have a feeling of unpardonable sin, and are careful with their language. They may also have an impulse to take things and think of suicide.

Boys should want to emulate their fathers, but not their mothers, this inquiry seems to indicate. Boys who want to be like father have few worries, few feelings of remorse and no thoughts of suicide.

If they want to be like mother, they are likely to be remorseful, have dizzy spells and forgetfulness, and to think they have enemies.

Girls can want to emulate father, however. They have no headaches or dizzy spells, and they are conservative, they claim, with money. If they want to be like mother, they are affectionate and get along well with the boys, but they may be forgetful and believe they have enemies.

Science News Letter, May 13, 1939

PHYSICS—PSYCHOLOGY

Alcohol Quicker Pain Killer Than Any Drug, Even Morphine

Physics Experiments Giving Definite Quantitative Results Show That One Aspirin Is as Good as Six

ALCOHOL is a quicker pain-killer than any drug, even morphine, and six aspirin tablets are no better than one, it has been found in studies on the human body's tolerance to pain reported to the meeting of the American Physical Society.

Describing the first exact physical measurements on the threshhold of pain in the human body, Drs. J. D. Hardy, H. G. Wolff and H. Goodell of the Russell Sage Institute of Pathology, Cornell University Medical College, New York, said that the pain produced over a large area of the body is no greater than is the pain produced over a small area.

Thus there is no summation of pain as there is with the sense of touch, sight or the body's detection of heat and cold.

"This finding," Dr. Hardy declared, "may represent a wise provision of nature which wants the body to be very sensitive to heat but which warns the body as much for the destructive stimulus on a small area as on a large one."

By injection of drugs it was found the total effect obtained by aspirin is secured after the first tablet is taken. Six tablets do no better.

Rating intolerable pain as 100 per cent., the scientists reported aspirin's relative effectiveness as 35 per cent. At the same time they found that injections of alcohol rated 40 per cent. And they found that the alcohol acted within 15 minutes instead of hours required by other drugs.

To fool the test subjects dummy injections were sometimes given. It was possible, with these, to demonstrate the psychological effect of will-power on deadening pain.

One pain was found to deaden another. A tight clamping of the arm to produce pain dulled pain produced on the forehead by radiation. This is a scientific demonstration of the well-known habit of biting the lips when pain is experienced elsewhere.

Morphine, the master pain-killer, was found to act on the brain and to create pain tolerance all over the body in equal amounts. This finding means that morphine sufficient to dull pain from one tooth extraction would be equally good if two or three teeth were all pulled at once.

To produce pain without heating or by contact the Russell Sage scientists used radiation from a brilliant 1,000-watt electric light whose rays were focussed on the blackened foreheads of the subjects under test.

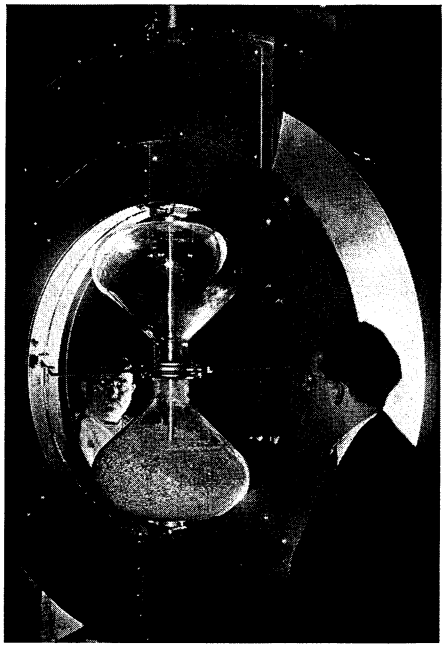
A shutter exposed the forehead for short intervals which were gradually lengthened until a sensation of pain was just detected at the end of the exposure. At this point a sensitive thermocouple was used to measure the amount of radiation present. By these measurements a threshold of pain could be calculated.

To show that they were measuring only pain and not severe heating, the scientists gave the subjects aspirin to raise the pain threshold (give greater tolerance to pain before the ability to detect it.) It was then found that the pain threshold went up but the heat threshold went down. This indicates that pain, alone, was being measured.

Varying areas of the forehead were exposed to the radiation and the pain threshold remained the same. This means that the pain sensation in the body is not an additive one.

Studies of the time it took various amounts of radiation to produce pain showed that not only was the amount of temperature rise important but also the rate of rise of temperature.

Thus the scientists were able to produce severe sensations of pain with only a two-degree rise in the skin temperature if they made this rise occur fast enough. In contrast a slow rise in skin temperature produced only minor sensations of pain until much higher skin temperatures were attained.



TWO LARGEST

Installed within the bob of the world's largest pendulum is the world's largest hourglass, in which the finely crushed shells of 2,000 eggs are used instead of the much heavier sand. The pendulum itself, a part of the Westinghouse exhibit at the New York World's Fair, requires 30 minutes to swing its full arc of 60 degrees. The bob weighs half a ton.

New Evidence of Neutrino

LIKE detectives hunting a ghost, scientists have been searching for the neutrino—a hypothetical, elusive atomic particle, long-sought but never found.

At the meeting of the American Physical Society, University of Michigan researchers reported that the search is "warm." Still missing—and perhaps ever to remain so—is the neutrino itself, but