



ATTACKING CANCER—Prof. Mitchel Weissbluth handles the controls of a new "cancer gun" at Stanford Medical School, San Francisco. Patricia Steed is visible in the patient's chair through a three-inch window of lead glass. At right is the gun, a six-million-volt linear electron accelerator, which provides high energy X-rays for treating deep-seated tumors. The accelerator and its housing were built with funds from the American Cancer Society, the U. S. Public Health Service and the James Irvine Foundation.

BIOCHEMISTRY

Birth Shock Absorbers

► **BABIES** are helped to survive the birth shock of change to a new environment by a system of chemical shock absorbers. These are normally supplied by each infant's liver.

In the future, scientists may be able to provide some of the chemical birth shock absorbers for babies who have trouble breathing for a few hours after birth.

Discovery of the chemical birth shock absorber system was announced by Dr. Claude A. Villee and associates of Harvard Medical School and Boston Lying-In Hospital, Boston, at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

"During the birth process," Dr. Villee pointed out, "the infant needs a large amount of energy, and needs it in a hurry, to keep him going. He is not feeding in these early hours as there is no way he can get food from his mother and the nourishment he received through the placenta has been cut off."

Just a few days before birth, a sudden increase in chemical activity is noted in the liver. Enzymes that have been relatively quiet until then suddenly spring into action. The enzymes enter into a series of 12 chemi-

cal reactions with body sugars to form pyruvic acid, a building block of fat.

This activity of sugar storage continues until birth. At that point, the process is reversed as other enzymes go to work in a series of six additional reactions to release the stored energy and convert the sugars to fats in the process.

The stored sugar material, or glycogen, is rapidly used up in the first few hours after birth and provides the energy demands in the absence of food. When the adjustment has been completed the glycogen level returns to normal and production of fats resumes in an orderly fashion.

"It is at this point," Dr. Villee said, "the liver starts an aging process which will continue for the duration of life. But the system of chemical shock absorbers it has produced has enabled the infant to adjust to his new surroundings and survive."

Although rats were used in the research, Dr. Villee described the process as being identical to that experienced in humans. Associated with Dr. Villee were Drs. D. D. Hagerman, R. Kimmelstiel, J. M. Loring and F. M. Wellington.

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VIROLOGY

Attack Virus Before It Forms New Particles

► **TO STOP INFLUENZA**, mumps or other virus disease, you have to attack it chemically before the virus reproduces, Dr. Frank L. Horsfall Jr. of the Rockefeller Institute for Medical Research, New York, has discovered.

The cellular process leading to reproduction of viruses starts in a latent period considerably before new virus particles emerge. Chemicals stop the virus reproduction when given at this stage, Dr. Horsfall found in laboratory experiments, but they do not stop reproduction given after this point, he reported to the National Academy of Sciences meeting in Washington.

The rate at which viruses reproduce varies considerably. New particles of mumps virus do not appear before 24 hours when growing in the laboratory. Influenza A and B viruses and Newcastle virus, a poultry disease that humans can get, produce new particles in less than three hours.

Virus particles move from the inside of the cell to the surrounding fluid in about one hour. The cell wall is not a serious barrier to new particles once they are formed.

When virus particles are adsorbed, or attached, to red blood cells, the red cells drop to the bottom of a tube in a kind of sandwich, or in doublets, as Dr. Horsfall called it, with the virus particle between each two red blood cells.

Non-infectious virus particles can accumulate as well as infectious ones, and by their very numbers can affect the cell they are in, even if they do not cause infection.

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AGRICULTURE

Hot Water Bath Makes Cotton Seeds Sprout

► **HOT WATER BATHS** have solved an agricultural problem in California.

High-yielding Pima S-1 cotton seeds are covered with a hard covering. As a consequence, germination has been slow and irregular.

Studies in the University of California at Los Angeles botany department by V. T. Walhood, U. S. Department of Agriculture agronomist, have demonstrated that a one-minute immersion in water at 185 degrees Fahrenheit does the trick. Most of the hard seeds of this extra-long-staple cotton germinate within two or three days following this treatment.

Irregularity in germination has been a particularly serious problem on cotton-planted land under irrigation in the arid Southwest, where most of the nation's extra-long-staple cotton is grown. Slow sprouting of seeds meant extra irrigation, so growers overseeded at considerable extra cost to insure adequate stands.

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