



**MISSILE MASTER**—An electronic system to control and coordinate NIKÉ anti-aircraft missiles has been developed by the Army and Martin. Electronic consoles, similar to these radar entry consoles at Fort George G. Meade, Md., are the heart of the system. Here operators use photoelectric light guns placed against the screens to enter targets into the electronic tracking system.

## BIOCHEMISTRY

## Stress Makes Obese Eat

► **SADNESS** or other emotional upset makes some overweight people eat more because the emotional stress upsets the body mechanism for handling sugars and starches.

Apparently sugar is removed from the blood too fast after eating, and this lessens the feeling of having had enough to eat, which in turn leads to overeating.

Experiments showing this, including some in which hypnotism was used to bring on hunger contractions, were reported by Drs. Albert J. Stunkard and Harold G. Wolff of New York Hospital-Cornell Medical Center, New York, at the meeting of the American Psychosomatic Society in Boston.

When a measured amount of sugar solution was injected into the veins of obese persons, it disappeared from the blood at higher than normal rates. Further study of four very fat people over several months showed that, when they were under stress of an emotional sort, injected sugar was removed from their blood at abnormally fast rates. But when these people were going through relatively calm periods and feeling well, injected sugar was removed at the normal rate.

The changes did not seem to come from variations in the sugars and starches they ate.

Injecting sugar into the veins of fasting persons stopped the hunger contractions of the stomach, the scientists found. From this and other experiments they reported support for the theory that hunger comes when the sugar and starch stores of the body are depleted, and that the feeling of satiety, or having eaten enough, comes when these stores are replenished.

In these experiments, the results were the same for the obese people as for those of normal weight.

To test the possibility that in very fat persons the replenishment of sugar stores is not properly signalled to the brain centers regulating feeding behavior, the scientists used hypnotism.

By hypnotic suggestion, they induced the hunger contractions of fasting. This could be done satisfactorily. But when sugar was injected into the veins of the fasting persons, the hunger contractions stopped and could not be brought on by hypnotism.

This showed the power of the sugar depletion-sugar replenishment, hunger-stopping mechanism.

Science News Letter, April 7, 1956

Two important *vegetable diseases*—downy mildew of lima beans and late blight of tomatoes—have been controlled experimentally with streptomycin.

## BIOPHYSICS

## Small X-ray Doses Damaging to Unborn

► **RADIATION DAMAGE** to unborn offspring is greater when the radiation comes in small repeated doses than in a single dose of the same total amount.

This discovery, made by X-raying pregnant mice, is announced by Dr. Robert Auerbach at Oak Ridge National Laboratory, Oak Ridge, Tenn., in *Nature* (March 24). Dr. Auerbach is now at the National Cancer Institute, Bethesda, Md.

The finding "adds yet another factor calling for caution" in use of radiation for treatment, Dr. Auerbach points out.

Mice nine days pregnant were given either a single X-ray dose of 300 roentgens or three 100-roentgen fractions at 30-minute intervals. The animals were sacrificed three to six days later and the embryos examined.

Damage to the eyes and vertebrae and spinal cord were as frequent in one group of embryos as in the other. The damage was much more severe in the embryos that got divided doses of X-rays.

Science News Letter, April 7, 1956

## ANIMAL PHYSIOLOGY

## Measure Rat's Sense of Smell

► **AN APPARATUS** that makes it possible to measure the sense of smell in a rat was reported at the Eastern Psychological Association meeting in Atlantic City, N. J.

The rat's ability to discriminate odors is now being tested in a miniature wind tunnel equipped with a bar the rat can press to obtain a reward. The apparatus was developed by Drs. Carl Pfaffmann and W. R. Goff of Brown University, and Dr. J. K. Bare of the College of William and Mary.

It has been very difficult to measure the sense of smell in the lower animals, they explained. The first obstacle was the difficulty of providing odorous substances in known concentrations. The second difficulty was to provide some clear way for the animal to show he detected the odor.

To get around these difficulties, they put the rat in a miniature glass and metal wind tunnel. The tunnel was continually flushed by a large volume of dry, purified air. At the psychologist's decision, odors are added to this air stream from a bank of odor flasks. The concentrations of odor are specified in milligrams of odorous substance per liter of total air flow.

The rat is first trained to press the bar and get his reward when the air is fresh and odorless. At the first sniff of odor he learns to stop bar pressing because in the presence of odor he is not rewarded.

The concentrations are then varied until an exact measure of the animal's sensitivity is reached.

Science News Letter, April 7, 1956