

## CHEMISTRY

**Preservatives Make Soft Plastics Better**

► A WIDE VARIETY of plastic products in common use will be better and last longer as a result of new plastic preservatives reported at the American Chemical Society meeting in New York.

Bell Telephone Laboratories scientists have overcome the oxidizing, or weakening, effects of carbon black coloration in polyethylene plastics by modifying antioxidants that perform well in the clear plastic, but are not satisfactory in the black product.

Polyethylenes are relatively soft plastics that have gained fame as "squeeze bottle" materials and are widely used in electrical insulation, flexible tubing and refrigerator bags. Normally polyethylenes are colorless, but small amounts of powdered carbon black are added to impart coloration and weather resistance.

In the presence of carbon black ordinary antioxidant preservatives, aromatic amines or phenols, are effective for less than 200 hours in high-speed tests at 284 degrees Fahrenheit.

Drs. W. L. Hawkins, V. L. Lanza, B. B. Loeffler and F. H. Winslow altered these antioxidants with sulfur dichloride to produce substituted thioether preservatives that are effective for more than 2,000 hours under the same accelerated conditions.

The Bell scientists reported that the new antioxidants appear to take advantage of the carbon black in the course of preserving the plastics.

Science News Letter, September 21, 1957

## SURGERY

**Brain Cooling Gives More Time for Heart Surgery**

► A BRAIN-COOLING technique that allows heart surgeons almost twice as much time as they now have for surgery inside a stopped heart was reported by a Japanese surgeon, Dr. Kazumi Taguchi, to the International College of Surgeons meeting in Chicago.

The brain-cooling method allowed heart action to be successfully stopped for periods up to 14 minutes. Without it, the brain would have been damaged from lack of oxygen after only four minutes.

The brain is cooled by short circuiting its blood supply from the common carotid artery out of the body and into two plastic tubes. There, the blood is cooled down and then pumped back into the head. In this way, the brain's temperature is lowered to 65 degrees Fahrenheit while the rest of the body remains much warmer.

The technique was first used on a ten-year-old-girl suffering from a defect in the upper chamber of her heart. Blood circulation was completely stopped for more than 14 minutes while the defect was corrected.

For several years, surgeons have performed delicate heart operations with the heat of the body lowered ten degrees or more by the technique of hypothermia, but this allows the doctor only about eight

minutes to work before the circulation must be started again.

Two drawbacks to hypothermia have been brain damage from too little oxygen in some cases and fibrillation, a rapid and erratic beating of the heart that sometimes develops at lowered temperatures.

The brain-cooling method eliminates both, since the rectal temperature is kept rather high to protect the heart against the fibrillation, while the brain itself is cooled down. It has been used successfully on three heart cases.

Dr. Taguchi is a Japanese Government scholar now at the University of Minnesota Medical School.

Science News Letter, September 21, 1957

## BOTANY

**White Jungle in Brazil May Have New Genus**

► THE "WHITE JUNGLE" in southern Brazil contains a paradox, a small tree with white, bell-shaped flowers that may represent a new plant genus.

Dr. Lyman B. Smith, Smithsonian Institution botanist, and Padre Raulino Reitz, director of the state herbarium of Santa Catarina, Brazil, have reported that they discovered the strange tree while making a botanic exploration of the white jungle. The tree has characters unique to two major plant families that, it is believed, have never before been found in combination.

"Golden rain," a Chinese plant with immense sprays of golden blossoms that has been introduced into American gardens, is typical of the first family, the *Sapindaceae*. The second family, not even remotely related, is the tea family.

The white jungle, in which the tree was found, probably gets its name, the scientists reported, because of two kinds of forget-me-not trees growing there. They have great crowns of white blossoms. Seen from above, the forest would look like a pale green sea with large white caps.

Science News Letter, September 21, 1957

## PSYCHOLOGY

**Harder to Type From Dictated Record**

► IT is harder to type from a dictated record than it is to work from plain typewritten copy, an experiment conducted by scientists at the U. S. Civil Service Commission has shown.

The Commission does not ordinarily give an examination for typists who work from recordings, but when a blind typist applies the test is given in this way.

Now, a test of sighted typists who transcribed from recordings and also from plain typewritten copy shows that it would be conservative to give the blind applicants a 15-point advantage on the speed score over sighted typists who work from plain copy.

The research was reported to the American Psychological Association meeting in New York by Meyer Shultz and Miss Marcia Boynton.

Science News Letter, September 21, 1957



## PSYCHOLOGY

**Chemical Can Undo Learning of Single Act**

► A CHEMICAL injected directly into a cat's brain undoes the learning of a single act without affecting other similar behavior.

This discovery throws new light on exactly how and where in the brain learning takes place, Dr. E. Roy John of the University of California at Los Angeles reported to the American Psychological Association meeting in New York.

The cats were trained to avoid a mild electric shock by jumping when they heard a tone of a certain frequency. They also learned to avoid the shock when their box was darkened.

Then chemicals were injected into the cats' brains. This wiped out the learning to avoid shock at the darkening of the box but left intact the response to the tone.

The particular learning that was blocked depended on which chemicals were injected, their concentration, and the place in the brain chosen for the injection.

The chemicals used for the brain injections included reserpine, serotonin, atropine, epinephrine, potassium and calcium.

Science News Letter, September 21, 1957

## VIROLOGY

**Orphan Viruses Found in Animals as Well as Man**

► "ORPHAN" VIRUSES have now been found in the intestines of different animals, as well as in man.

In humans, these intestinal viruses are called orphans because the diseases to which they belong are unknown, and they will not produce illness when injected in laboratory animals.

The new animal viruses have been named Ecmo, Ecto and Esco, and are found in the intestines of monkeys, cows and pigs respectively.

This was reported by Drs. G. D. Hsiung and Joseph L. Melnick, Yale University School of Medicine, to a conference on animal disease and human health at the New York Academy of Sciences.

The now well-known Echo group of human viruses contains at least 19 different types that have been isolated from normal children as well as from patients with aseptic meningitis. The Echo name stands for enteric cytopathogenic human orphan virus.

Families of viruses like the herpes and pox virus have been known to exist both in animals and man, but up to now the intestinal or enteric viruses had not been found outside the human body.

Science News Letter, September 21, 1957

# CE FIELDS

## MEDICINE

### Leukemia, Mongolism Believed Related

► CHILDHOOD leukemia and mongolism may be related by a "common denominator," Drs. William Krivit and Robert A. Good, Variety Club Heart Hospital, University of Minnesota, report in the *Journal of Diseases of Children* (Sept.), an official publication of the American Medical Association.

The possibility of a link between the two appears so strong that the scientists have asked all doctors noting the two conditions in the same child to report them immediately.

Leukemia is the usually fatal cancer-like disease characterized by the body's production of too many white blood cells. Mongolism is an extreme form of mental deficiency with such physical signs as a flattened skull and slanted eyes. The cause of both conditions is unknown.

Mongolism is thought to be caused by some physical, chemical or infectious stress that affects an unborn child between the sixth and ninth week of life. A similar cause has been suggested for leukemia, which is thought to be a type of virus infection or cancer.

The nationwide survey was prompted by scattered reports that between 1952 and 1955 there were 34 cases of simultaneous occurrence of the conditions in children four years old or younger.

The highest number that could be expected by chance alone is 12.3 cases, the authors report.

Six cases have already been reported for the first half of 1956 and this is almost half of the theoretical total of 12.3 expected in a four-year period.

Drs. Krivit and Good hope to obtain figures for the last part of 1956 and all of 1957. If these are similar, the findings of the study will be even more convincing, they said.

Science News Letter, September 21, 1957

## DEMOGRAPHY

### Population to Grow Most In Big States and Cities

► POPULATION will increase in all parts of the United States between now and 1970, but the lion's share of the increase will go to the Pacific and Mountain states. This is the estimate made by Dr. Jacob S. Siegel, chief of the population estimates and projections branch of the Bureau of the Census.

The western part of the nation will also have an increased proportion of the total population. In 1955, the Pacific states had 10.5% of our total population. By 1970, 12% or more of Americans will live there.

Our largest states will become even bigger, Dr. Siegel foresees. In 1955, more than

half of our people (53.9%) lived in our 10 largest states. By 1970, 56% will live there.

Our cities are expected to grow even faster than the country as a whole.

Total population increase for the United States between 1956 and 1965 is expected to be about 12% to 16%, but meantime the population of metropolitan areas will probably increase 16% to 20% and may even go up 23%. Counties outside the cities may grow 6% to 10% but possibly the increase may be as little as 2%.

Even without allowing for the fact that new cities may spring up, it is probable that by 1965 between 60% and 62% of our people will live in big metropolitan areas.

The biggest part of this growth of metropolitan areas will not be in the central city, however. Central city growth between 1956 and 1965 is expected to amount to between 9% and 13%, but the suburbs are expected to increase as much as one-fourth to one-third. The suburban counties are expected to outdistance the rural counties by a ratio of three to one.

Science News Letter, September 21, 1957

## PSYCHOLOGY

### X-Rays of Mother May Harm Unborn Child

► X-RAY treatment or examination of a pregnant woman as well as exposure to atomic radiation can make the unborn child mentally defective or emotionally disturbed. This was reported to the American Psychological Association meeting in New York by Dr. Ernest Furchtgott of the University of Tennessee.

Even the amount of radiation received during a standard gastrointestinal series is more than enough to do harm to the unborn child.

Studies by the Atomic Bomb Casualty Commission indicate that when unborn children were exposed to atomic radiation, it caused a decrease in size of the head and mental retardation.

Dr. Furchtgott reported experiments on the effects on rats of X-radiation before birth.

A dose of 50 roentgens is enough to produce loss of locomotor coordination. The irradiated rats were unable to run along a one-eighth inch rod as do normal animals. Their ability to jump was also adversely affected.

The radiated rats are more fearful and timid. They are unwilling to leave their home cage to explore the environment, hesitate to eat in a strange situation and either "freeze" or run around wildly when put in an unfamiliar place.

High doses of X-rays early in the developmental period produce abnormally active rats but radiation soon after birth has the opposite effect.

Radiated animals are mentally retarded—that is, they are retarded in their ability to learn to find their way through mazes. The greater the dose of X-rays, the greater is the retardation and the earlier the exposure to X-rays, the greater the retardation.

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## PHYSICS

### Bombard Meteorite Iron To Find Its "Handedness"

► IRON FROM a meteorite that fell to earth from somewhere in the solar system has the same kind of nuclear forces as iron found naturally on earth.

Physicists suspected this, but were not sure until they learned the results of experiments reported by Drs. N. S. Wall and Roy Weinstein of the Massachusetts Institute of Technology. They told the American Physical Society meeting in Boulder, Colo., how they bombarded the meteoritic and terrestrial iron with protons in the M. I. T. atom smasher, then measured the number of protons bounced back from the two iron samples.

The scientists were investigating whether "handedness" differs in other parts of the solar system from that predominant on earth. The fact that atomic particles seem to prefer one "handedness," either right or left, was proved only early this year when it was shown that parity is not conserved in weak interactions. (See SNL, Jan. 26, p. 51.)

Atomic particles can be considered as tiny, spinning tops. Until this year, scientists believed the assignment of right and left to the spinning particle was entirely arbitrary and their laws would hold if the assignment were reversed. Crucial experiments at Columbia University and the National Bureau of Standards showed there is a favored direction associated with the spin, that is, a preferred "handedness."

Science News Letter, September 21, 1957

## TECHNOLOGY

### New Steel Permits Flight At 2,700 Miles Per Hour

► AIRPLANES and missiles will be able to travel up to 2,700 miles per hour without suffering heat and friction damage to structural materials, thanks to the development of a new steel.

Major structural problems of flight at four times the speed of sound can be overcome by the use of a lightweight, ultra-high strength stainless steel developed by Armco Steel Corporation, Middletown, Ohio.

The inexpensive steel, PH 15-7 Mo, can withstand air friction heat of 1,000 degrees Fahrenheit in laboratory tests, Armco president R. L. Gray said. An experimental X-2 rocket plane holds the record of withstanding 700 degrees Fahrenheit at 2,260 miles per hour.

In addition to high strength at supersonic speed and a production cost just one-tenth that of high-strength titanium alloys, Armco claims other outstanding qualities for its steel, including ease of fabrication, corrosion-resistance, and assured production in volume.

The PH 15-7 Mo identification of the steel means that it is a precipitation hardened steel containing 15% chromium, seven percent nickel and a small amount of molybdenum.

Science News Letter, September 21, 1957