

## CHEMISTRY

## Fluorine-Chlorine Plastic Very Inert to Chemicals

► FLUORINE AND CHLORINE make up by weight four-fifths of a new plastic which is an unusually stable, high-temperature material of the thermoplastic type, extremely resistant to chemical action. It is not brittle although strong and hard, and while particularly suitable for use at relatively high temperatures, gives satisfactory performance at low temperatures.

The new plastic is chemically a polymer of trifluorochloroethylene. That is, it is a form of this chemical in which many molecules are linked together to form giant molecules. It is a product of the M. W. Kellogg Company, and will be known as Kel-F. Commercial production is yet only in limited quantities. It was developed by Kellogg scientists in consultation with Dr. W. T. Miller of Cornell University who was the leader in the early work on the reactions of this fluorine-chlorine-ethylene chemical.

Kel-F is closely related to the interesting new family of organic compounds known as the fluorocarbons. In it, however, some of the fluorine is replaced by chlorine. Fluorocarbons are similar in structure to the hydrocarbons of petroleum, but differ in that all of the hydrogen is replaced by fluorine. The hydrogen is the point of chemical attack in the hydrocarbons. The absence of hydrogen gives the fluorocarbons, and Kel-F, extraordinary chemical inertness.

Science News Letter, September 11, 1948

## PUBLIC HEALTH

## Ten-Year Health Program Revealed by Government

► THE administration has just unfolded a ten-year national health program under which the federal, state and local governments would spend \$4,107,000,000 a year—more than twice current outlays—on health services by 1960.

The program set forth nine basic goals as targets for 1960 in a campaign "to promote the highest possible level of national health."

At the core of the program was a system of national health insurance which was not covered by the cost estimates. President Truman has urged a health insurance program in the past but opposition in Congress and the medical profession has blocked action.

Federal Security Administrator, Oscar V. Ewing, submitted the program to Mr. Truman in a printed report of 186 pages. It was prepared in response to a request made by the President last Jan. 30.

The report listed these basic goals:

1. Increasing the annual output of "medical manpower" by 40 to 50% in 1960.

2. A national health insurance program to assure that all people have needed health

and medical services.

3. An increase of 600,000 in hospital beds (now 900,000) by 1960 and a doubling of the present number within 15 years and the building of new health centers.

4. Federal help to establish adequate local health units "everywhere" and to set up citizen health councils in every state and community.

5. A federal non-military medical research program costing \$80,000,000 to \$100,000,000 a year by 1960.

6. Focusing attention on mental health.

7. Increased research in and control of chronic diseases to insure better adult health.

8. Rehabilitation services for 250,000 disabled persons.

9. Assuring the "utmost degree of health" for every child.

Mr. Ewing estimated that the proposed program would cost the federal government \$2,312,000,000 and state and local units \$1,795,000,000 in 1960, a total of \$4,107,000,000. The comparable total for last year was \$1,962,000,000.

Those estimates did not include the proposed health insurance program, which presumably would be financed from payroll taxes.

Science News Letter, September 11, 1948

## ENGINEERING

## Giant Mars Flying Boat Is Valuable Navy Cargo Ship

► CAROLINE MARS is now the name of the largest flying boat in active service. Details of this 82.5-ton giant were revealed by the Glenn L. Martin Company, its designer and builder. It is the Navy's JRM-2, which can carry a payload of 35,000 pounds.

This giant flying boat was delivered to the Navy a year ago and since has been undergoing rigorous flight testing and experimental work. Its first long-distance non-stop flight was made this summer in a trip from the Naval Air Station, Patuxent River, Md., to Alameda, Calif. Since then it has been flown to Honolulu, and from there made a notable flight to Chicago to receive its new name.

The Caroline Mars is powered with four Pratt and Whitney engines, each of which develop 3,000 horsepower for take-off and landing. Each engine operates a four-bladed Curtiss electric propeller nearly 17 feet long. The boat has a cruising speed of 173 miles an hour with a maximum speed of 238 miles.

This airship is now joining forces with four other Mars in the 72.5-ton class. They are the Marshall, the Marianas, the Philippines and the Hawaii Mars. All are in use carrying cargo on Pacific routes. All are "descendants" of the original giant Mars that made many round trips between California and Hawaii carrying supplies to American service men during the last year of the war.

Science News Letter, September 11, 1948

# IN SCIEN

## MEDICINE

## Drug Reaction Causes Paralysis of Vocal Cord

► SENSITIVITY to the antibiotic, streptomycin, has taken many forms in different patients. A doctor in Los Angeles reported the case of a woman who developed paralysis of the left vocal cord after treatment with the drug.

This woman was treated for pain in her back at the Queen of the Angels Hospital, Dr. Lawrence K. Gundrum said in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 4). Following treatment for the condition she received injections of streptomycin and penicillin in her muscles. In about two weeks she noticed a lump in her throat and had difficulty in swallowing liquids.

Gradually she became worse and hoarseness developed. Examination showed complete paralysis of the left vocal cord. Although tests for sensitivity to streptomycin were negative, Dr. Gundrum feels that the nerve injury was probably caused by sensitivity to the drug.

Science News Letter, September 11, 1948

## DENTISTRY

## Majority of Toothbrushes Found Defective by Survey

► MOST Americans are pretty faithful about brushing their teeth but they neglect their toothbrushes. This was discovered in a survey reported in the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (Sept.).

Four out of five of the toothbrushes now in use in American families were found to be so badly worn or in such an unsanitary condition that they were no longer useful for oral hygiene, two Chicago dentists, Drs. Allen O. Gruebbel and J. M. Wisan, found.

A group of 1,929 families were selected as representing a cross section of the American public. They submitted 8,176 toothbrushes. Of these, 1,580 were found to be in satisfactory condition, while 6,596 were found unsuitable because of bent and broken bristles, matted bristles, unsanitary condition or a combination of these conditions.

It is evident from the study, the dentists concluded, that few Americans follow the oral hygiene practices recommended by dentists.

"The remedy for this situation can be found only in an aggressive campaign to inform every individual of the value of the frequent use and renewal of the toothbrush," they declared.

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# ICE FIELDS

## PHYSICS

### World's Most Powerful Linear Accelerator Planned

► A GIGANTIC ATOM SMASHER, hurling electrons with a billion volts of energy, will be built by Stanford University within the next three years, financed by the Office of Naval Research.

This new machine will be the world's most powerful linear accelerator, a high voltage apparatus that works on a principle different from the cyclotrons, now largest of the atom smashers.

Instead of speeding heavy atomic particles in a merry-go-round whirl as in the cyclotron, the linear accelerator shoots electrons in a straight line, giving them a dizzy ride down the tube on the crest of radio microwaves, such as used in radar (*See SNL*, July 20, 1946; Oct. 4, 1947).

Dr. William W. Hansen, director of the Stanford Microwave Laboratory, who will direct the building of the 160-foot accelerator, was co-inventor of the klystron, important in wartime microwave radar.

A 12-foot pilot model of the accelerator has already produced electrons of 6,000,000 volts.

Experiments upon the fundamental nature of matter and creation of artificial cosmic rays are possibilities through use of the billion electron volt energies to be reached by the new accelerator. Dr. Hansen believes that it may be possible to create protons and neutrons, the components of the atomic nucleus, through the use of such high energies.

Largest atom smasher operating now is 184-inch cyclotron at the University of California whose 400,000,000 electron volt particles recently produced for the first time man-made mesons (fleeting atomic particles in cosmic rays).

Two large cyclotrons, financed by the Atomic Energy Commission, one of 10,000,000,000 electron volts at the University of California, and another of 3,000,000,000 at Brookhaven National Laboratory, were announced earlier this year (*See SNL*, May 8, p. 291).

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## GEOLOGY

### Scientists Certain World Is Not Going To Tip Over

► SCIENTISTS are not worried about the world tipping over—physically and literally, at least.

A publicized theory suggests that the weight of the Antarctic ice cap may be enough to roll the world over. Such a drastic event would presumably flood most of the lands of the earth. To prevent this,

it is proposed that atomic bombs be used to break up the ice at the South Pole.

But the scientists who study the development of the earth are not concerned. U. S. Geological Survey scientists doubt that any existing polar ice masses are capable of tipping over the globe. One argument against it, they explain, is this:

During the Ice Age, much greater quantities of ice were found at the North Pole than are now found on the earth. It is known that this ice did not tip over the world.

Even if there were such a threat, some scientists pointed out, atomic bombings would not make much of a dent in the ice.

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## ASTRONOMY

### Seventh New Comet Of Year Is Found

► ANOTHER NEW COMET, the seventh to be discovered so far this year, has been found in the constellation of Aquarius, the water carrier.

Of the 12th magnitude and thus far too faint to be seen without the aid of a good telescope, comet Ashbrook was spotted at Lowell Observatory of Flagstaff, Ariz., according to Dr. V. M. Slipher, its director. News of its discovery has just reached Harvard College Observatory, clearing house for such astronomical information in the western hemisphere.

The comet, which has a relatively short tail, was discovered by Joseph Ashbrook of Yale University Observatory, who was visiting at Lowell Observatory. It is heading southeast, moving fairly slowly.

When discovered Aug. 26, the comet's right ascension was 23 hours, 11.9 minutes; its declination minus 14 degrees, 50 minutes. Its daily motion was minus 49 seconds in right ascension; minus two minutes in declination.

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## CHEMISTRY

### Lack of Plant Nutrients May Bring Crop Failures

► WIDESPREAD crop failures are a danger in the future unless American farmers feed their plants manganese, copper, boron and zinc as well as the conventional nitrogen, phosphorus and potassium fertilizers.

America's high crop yields are removing from the soil plant nutrients needed in small but essential quantity, George H. Serviss, Ithaca, N. Y., chemist, told the American Chemical Society.

While farmers are fertilizing their fields heavier and heavier with relatively pure salts of the three basic fertilizers, nitrogen, phosphoric acid and potassium, they are not replacing in most cases the chemical elements needed in small amount that large crops remove from the land.

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## BIOCHEMISTRY

### Protein Building Blocks As Good Food as Protein

► PROOF that the building blocks of proteins (most familiar to you in meat) are just as valuable as food as the protein itself has been obtained by experiments reported to the American Chemical Society meeting in Washington.

Dr. Erwin Brand of Columbia University and Dr. David K. Bosshardt of Sharp and Dohme, Glenolden, Pa., showed in tests on mice that it made no difference whether the protein fed them was a natural one extracted from milk or a mixture of the natural amino acids of which it is composed chemically. The protein used was crystalline beta-lactoglobulin, extracted from fresh milk.

Although this research has no immediate application to actual food problems directly, it is considered fundamental in understanding how food is used by the body. It was financed by the Navy's Office of Naval Research.

Science News Letter, September 11, 1948

## MEDICINE

### Needless "Shots" Will Eliminate Pain of Jab

► THE PAINFUL JAB of the hypodermic needle will soon become obsolete. Commercial introduction some time next year of a jet method of spraying medicines into the body by a very fine stream under high pressure, was promised in a report to the American Chemical Society.

Thousands of injections by the new needless "hypospray" method have shown it therapeutically effective, Dr. James M. McKibbin and Robert P. Scherer of the R. P. Scherer Corporation, Detroit, declared. Changes suggested by the clinical investigators are being incorporated in the commercial production.

Diabetics who have to take injections of insulin daily are expected to benefit from the new almost painless injections.

The new device forces medicine through the skin in so thin a stream that it causes only slight pain, a mild prickling sensation or no pain at all. The hole through which medicine is forced into the body measures only three-thousandths of an inch, about the size of an average human hair or a mosquito's stinger. As a result scarcely any pain fibers in the skin are stimulated.

Since the medicine never comes in contact with moving parts, there is no need for repeated sterilization. Hazards of dull needles and infection are eliminated.

Material to be injected is put in a new-type metal ampule and a spring-activated plunger exerts the pressure for the spray.

Doctors expect it to be helpful in giving immunizing injections to children who create scenes because of the pain of the usual hypos.

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