

highest honors to a member of the veterinary profession were conferred on Dr. Gerard Dikmans, who came to this country as a 19-year-old immigrant from the Nether-

lands in 1905. A graduate in veterinary medicine from Michigan State College, he has made a life-time study of animal parasites and the diseases they cause.

Science News Letter, July 23, 1949

#### ENGINEERING

## Long-Lived Crystals

➤ QUARTZ crystals, essential in radio and television, will have practically unlimited frequency-control life without deteriorating as a result of a heat-treatment process revealed at the laboratories of the U. S. Army Signal Corps, Fort Monmouth, N. J., where it was discovered.

The process involves superheating the crystal to approximately 900 degrees Fahrenheit, followed by slow cooling. Finished blank crystals are placed on a conveyor belt and passed through an electrically heated oven for a period of from two to three hours, then subjected to cooling through a 24-hour period.

The job of the quartz crystal in all types of radio transmission, and in other electronics, is to keep the emitted signals on their assigned radio-wave frequency. But these crystals age in use, permitting the

signal to slide or "drift" away from the desired frequency. They must then be replaced. A crystal which has been subjected to the new Signal Corps process, however, will hold to the desired channel indefinitely, and probably will never have to be replaced.

The discovery, made by Arthur C. Prichard, Maurice A. A. Druesne and Dr. David G. McCaa of the Signal Corps laboratories, is of vast importance not only to the armed forces but to civilian radio, television and communications, in all of which great quantities of quartz crystals are now used. They are imported products, because few satisfactory crystals have ever been found in United States. Had this new method been available during the recent war, many millions of dollars spent for replacements would have been saved.

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#### ENGINEERING

## Steel-Making in Russia

➤ SOVIET RUSSIA is reported to be spending two billion dollars, the estimated cost of the American development work on the atomic bomb, on a new method of making steel. This huge expenditure is listed in the ANNALS OF THE AMERICAN ACADEMY OF POLITICAL SCIENCE (May).

Dr. Gerald Oster, physical chemist at the University of London, says that the huge sum is being spent by the Soviet government on steel plants in the Donbas and Soviet Asia. The process, which uses pure oxygen or oxygen-enriched air in the blast used to make steel, is being used more or less widely in this country.

U.S.S.R. development of the use of oxygen in steel making is based on the work of Russia's best known atomic scientist, the English-educated Dr. Peter Kapitza, the report explains. Dr. Kapitza has developed a turbine for producing large quantities of pure oxygen more quickly and cheaply than previous methods.

In the new oxygen process, cost of making steel is said to be reduced 25% to 30%.

Another important industrial use of oxygen in the Soviet, Dr. Oster states, is in work on burning coal underground to produce gas. Proposed by famed Russian chemist, Mendeleev, in 1888, underground gasification of coal was first experimented with by the Soviets in 1931, Dr. Oster says. American scientists also are working on this.

Dr. Oster, who was formerly a research associate at the Massachusetts Institute of Technology and Princeton University and was on the staff of the Rockefeller Institute for Medical Research, praises Soviet planning of scientific research. The way research is organized in the U.S.S.R., he terms "comparable" to the program of American and British work which produced the atomic bomb.

Soviet mathematics is lauded in the same publication by a Princeton University mathematician.

Mathematical developments in the U.S.S.R., comments Dr. Solomon Lefschetz, "parallel those in the United States with equal energy and vigor in research."

Importance of Soviet mathematical work is indicated by the fact that many young American mathematicians are learning scientific Russian just to read of work done by the Soviets. Dr. Lefschetz declares.

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#### NUCLEAR PHYSICS

## Plastic Balloons To Carry Instruments Higher

➤ SUPERBALLOONS of thin, tough plastic will soon carry scientific apparatus weighing as much as two men to greater heights above the earth than now achieved,

it was learned at the University of Denver International Cosmic Ray Symposium in Idaho Springs, Colo.

Much information about cosmic rays from outer space has been obtained from recorders and photographic plates hung from balloons that rise 18 to 20 miles upward in the Office of Naval Research "Operation Skyhook." At their highest altitude these bags filled with helium gas are about 75 feet in diameter and scores have been launched from Camp Ripley, north of Minneapolis.

Some of the flying saucers that have been reported were undoubtedly these high-flying balloons shimmering in the sky. The unaided human eye can see these balloons even 20 miles high.

The new balloons are made bigger and better by use of a process of welding the very thin film of polyethylene plastic of which they are composed. Ordinary Scotch tape was used in the beginning to put the balloons together, and while special adhesives are now available, the welded seams will make possible hundred-foot-diameter balloons. Several miles higher will be reached with these new balloons, and this is expected to capture incoming cosmic particles, less impeded because of the even rarer atmosphere at such great heights.

With a lift of about 300 pounds provided by three balloons, larger loads of cosmic ray counters and photographic plates will be sent upward to regions that man cannot visit. Usually only one balloon carrying less weight will be used.

This apparatus is parachuted back to earth when the balloons reach their greatest heights, and the messages they carry help explain the mysteries of how matter is put together.

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#### BIOLOGY

## Chart on Mammals Lists Biologic Characteristics

➤ IF YOU know the weight of an elephant's brain, you can get at a glance such data as his water intake and body weight. Or you can spot the weight of a mouse's liver, if you know his heart beat.

These are some of the possibilities with a chart developed by Dr. E. F. Adolph of the University of Rochester. Dr. Adolph's chart, published in the journal, SCIENCE (June 10), listed 34 properties of mammals including man. The relationships between these 34 biological characteristics have been established so that with the chart, a ruler and any one of the measurements, you can immediately read off any of the other 33 for a particular mammal.

Relationships on which the chart is based apply to physiological processes, sizes of organs, numbers of reduplicated structures and biochemical compositions.

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