fostered. For example, he created the electric power industry by inventing not only the lamp, but also meters, conductors, the power plant electric generators, fuses, etc., to distribute electricity over large areas through the streets of a city to individual homes, factories, and offices.

The energy unleashed by electric power was made a servant in the home through vacuum cleaners, electric stoves, washing machines, refrigerators. Radio, television and the phonograph added to the pleasure of millions of people.

Edison's invention, thus, not only created new industries and new jobs but made everyday living more comfortable and more enjoyable.

Edison invented the industrial research laboratory. His was the first one of the 4,000 in America today. From these research laboratories, and others that will be founded in the future, a whole new world of science and technology is emerging.

Science News Letter, February 9, 1957

TECHNOLOGY

World Going Down to Sea in Atomic Ships

➤ THE WORLD is going down to the sea in atomic ships.

The United States already has two seagoing atomic submarines, the Nautilus and the Seawolf. Thirteen more nuclear subs are planned. Plans are complete for an 85,000-ton atom-powered aircraft carrier to be built by the Navy. The largest ship in the world, it will be driven by eight atomic engines. Now, a joint AEC-Maritime Administration program calls for the development of nuclear powered merchant ships.

Japan has announced plans to build the world's largest submarine, an atomic-propelled oil tanker. Designed to cruise at 22 knots, the Japanese underwater cargo vessel will weigh 30,000 tons.

Russia is already building an atomic icebreaker and hopes to launch it from a Leningrad shipbuilding yard sometime this year. The first Russian ship to be atomic-powered, the ice breaker will displace 16,000 tons and, like the Japanese sub, will travel along at 22 knots.

Great Britain has jumped into the atomic ocean and is completing plans on the drawing board for the Royal Navy's first atomic submarine.

But like the slogan of the U. S. Naval hero, John Paul Jones, the world's ship designers and builders "have not yet begun to fight."

Experts foresee the atomic merchant fleet of tomorrow that includes fishing vessels that are floating factories, sending finished products from ship to market; mining ships for drilling underwater oil; and atomic ships that can "duck" under water in rough weather.

The experts point out that atomic ships will be faster, larger and more economical. They think the pioneer atomic ship may be either a large tanker, a dry cargo ship or a combined passenger-cargo ship.

Science News Letter, February 9, 1957

CHEMISTRY

Some Body Waste Is Reused by Body

➤ A SIGNIFICANT portion of one of the body's waste products, uric acid, is reused by the body.

Until recently it was generally believed that uric acid was strictly a waste product excreted in the urine. Then scientists found they could account for only about 85% of the daily uric acid output in the urine.

Using radioactive carbon as a tracer, a group of University of California scientists have found that 10% to 16% of uric acid output is channeled back into the body's metabolism.

The uric acid apparently takes part in normal body processes, the scientists found.

The researchers injected radioactive carbon dioxide into normal people and people with gout and polycythemia. In polycythemia, a blood disease, there is an increase in uric acid in the body, and it is lodged in the joints. Polycythemia patients, as a result, often have gout.

The radioactive carbon missing from the urine was found in exhaled carbon dioxide. This meant that 10% to 16% of the uric acid was broken down by the body, one product being radioactive carbon dioxide.

The findings were reported to the meeting of the American Federation for Clinical Research in Carmel, Calif., by Drs. M. Pollycove, B. M. Tolbert, J. H. Lawrence, and D. Harman of the University's Donner Laboratory.

Science News Letter, February 9, 1957

MEDICINE

Small Radiation Doses Cause Blood Changes

➤ RADIATION doses smaller than those officially permitted in atomic installations and research laboratories can produce detectable, although not necessarily harmful, changes in the blood.

This was reported to the American Federation for Clinical Medicine meeting in Carmel, Calif., by Dr. R. Lowry Dobson of the University of California's Donner Laboratory.

Dr. Dobson's results came from a more extensive investigation of an observation first made at the University of Rochester in 1949. Rochester scientists found that in researchers receiving permissible, although unmeasured, doses of radiation there was an increase in an anomalous type of lymphocyte, a kind of white cell.

The anomalous cells have two nuclei instead of the normal one, and are called binucleated cells. The binucleated variety occur in normal individuals at a rate of about one in 50,000.

Dr. Dobson found that an increase—to an average of six binucleated lymphocyte cells in 50,000—occurred in 17 scientists exposed to an average of 200 milliroentgens (mr) of gamma and X-radiation per week for short periods. The permissible dose is 300 mr per week.

This increase appears to be small, and can be detected only by elaborate statistical methods, Dr. Dobson said.

The scientist stated that there is no present evidence that this increase is a hazard to health.

The main object of the study is to determine the smallest amounts of radiation that can cause physiological changes, what these changes are, and whether over a long period of time small radiation exposures—such as those incurred by atomic workers and by people receiving X-rays—pose any hazard.

Binucleated cell increases are also observed in certain diseases, such as hepatitis and mononucleosis and possibly in carbon tetrachloride and other poisonings.

Hazards from the small increases in binucleated cells appear to be minor when compared to those incurred by smoking, dietary indiscretions, automobile travel, etc., Dr. Dobson said.

Science News Letter, February 9, 1957