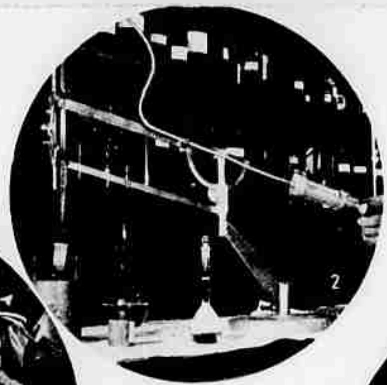
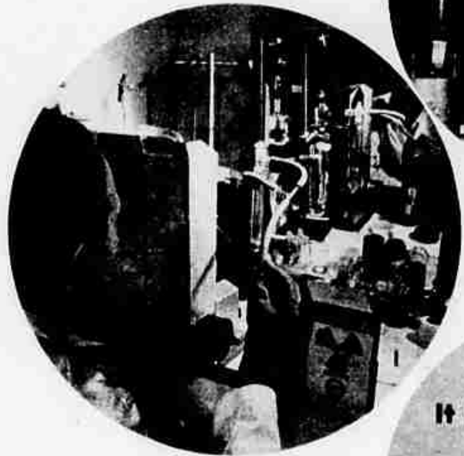
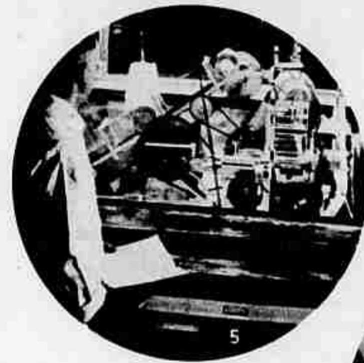
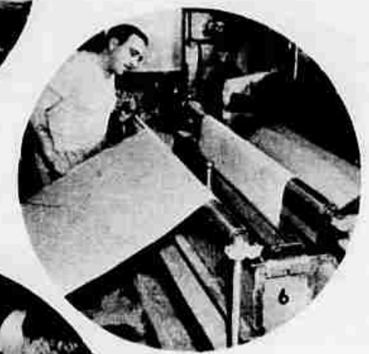




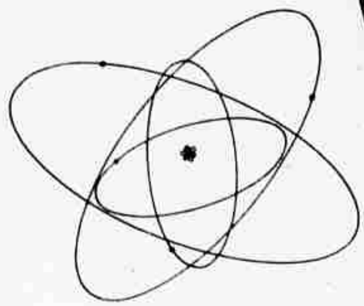
It is already working in countless ways to enrich and lengthen your life.





Examples of the peaceful uses of the atom are: (picture 1) Oak Ridge laboratory worker uses protective shield in processing radioisotope; (2) Vial of radioactive drug is placed in a lead container to protect against radiation; (3) Worker in lab shows how to handle radioactive iodine in New York's Columbia-Presbyterian Medical Center; (4) In diagnosing thyroid growth, physician measures radiation after iodine dose; (5) Canned foods are checked by radiation in conveyor system at University of Utah; (6) Uranium is used in textile dyeing process, one of first successful industrial applications of atomic energy; (7) Chemist seeks rustproof quality in metals with radioactive liquid; (8) Downtown Pittsburgh aglow with a symbolic demonstration of atomic-electric generation.

What the ATOM is doing for you



by Lillian Pompian

Most of us think of the atom in connection with the bomb—as something destructive. Though we've all heard about "peaceful uses" of atomic energy, they have seemed experimental and largely a hope for the future. Actually, nothing could be farther from the truth. Every day, in countless ways you are already benefiting from the "peaceful atom."

A few months ago a 40-year-old man lay near death from a brain tumor the doctors could not locate. Radioactive phosphorus, which tends to concentrate in tumors, was injected into the brain. It sent out rays revealing the size and position of the growth.

A city in the East was troubled by leaks in the water mains that led to its industrial area. Radioactive sodium was introduced into the lines and the path of radiation followed with a Geiger counter. Wherever the clicks of the counter slowed, it was clear that both water and radiation were seeping out. Thus, leaks were located and repaired without the necessity of tearing up the streets.

An appliance manufacturer was besieged with complaints about his dishwashing machine. He knew that dried stains of fried egg yolk are difficult to remove from dishes and cutlery. He therefore decided to test his machine with radioactive eggs. These are produced by putting an isotope, radiophosphorus, in harmless amounts in the feed of hens. The eggs laid by these hens were fried, and smeared on dishes and forks. Then radiation was accurately measured.

The manufacturer then ran a series of tests using different agitators in his dishwasher and varying the detergents and water temperature. After each test he was able to measure the invisible yet radioactive traces of egg left on the dishes: Result: a much improved dishwasher.

These are only a few of the ways in which atoms are working for you. The newsprint in your paper, the cigarettes you smoke, the gasoline and oil in your car, the tires you ride on, the detergents you use in your washing machine, the linoleum on your floor and the wax on it—all may have been produced or tested with the assistance of isotopes.

What are isotopes? They are simply the radioactive form of the various elements such as gold, phosphorus, iodine, cobalt, and sodium. They are made by placing a small pellet of gold, for example, in an atomic reactor at Oak Ridge where it is bombarded with neutrons. The atoms of gold begin to split, giving off energy in the form of rays which can be detected by a Geiger counter. Such atoms are then called either radioactive isotopes or radioisotopes.

Isotopes represent one of the great extensions in man's ability *to see.* Any substance can be "tagged" with an isotope and its path followed through the human body, a plant, a piece of machinery, or whatever is tested.

Medical investigators are tagging food substances and drugs with radioactive atoms and following their path to see how and where they are utilized in the body. Radiosodium injected into the bloodstream is probing the mystery of heart and circulatory diseases. Cobalt-60 is being used against certain types of cancer; radiophosphorus, to control excess of red cells in the blood and in treating certain types of leukemia; iodine-131, to destroy cells in overactive thyroid glands.

More than 60,000 persons have already been treated with isotopes, and more than a half-million have had ailments diagnosed with their aid.

There have been some spectacular uses of isotopes in agriculture, too. Scientists added radioactive phosphorus to fertilizer and followed its progress through the plant. They were able to tell how much moves into the plant, how much fertilizer a plant can use, at what stages of growth the plant makes use of it, and how it can be applied so it is absorbed without waste. As a result, fine new plant varieties such as rust-resistant oats and plants yielding 30 percent more per acre have been produced successfully.

A pioneer oil company discovered the value of radioisotopes in developing lubricating oils that give longer life and efficiency to your car. Engineers fitted the engines with piston rings that had been made radioactive, added lubricating oil, and started the motor, testing the oil's performance.

Radioactive iron atoms were worn off the rings along with others and were easily detected in the oil with the aid of a Geiger counter.

Formerly, it was necessary to run an engine the equivalent of 20,000 miles, then take it apart and measure the pistons. The sensitivity of the radioisotope method was so high that the wear of the rings could be detected in the first few minutes of running time.

Your tires are being checked with isotopes. Radioactive material is added to a new tread. After test runs, Geiger counters measure the radioactivity left, and that tells them how much of the rubber has been worn off.

A homey example of the use of isotopes is in the production of wax for your floors and linoleum. A radioactive substance is mixed in with wax and radiation counts are taken regularly to see how rapidly the wax is wearing off.

The ability of radiation to penetrate matter has led to extensive industrial use of isotopes. A part of the radiation is always stopped by the material being irradiated. A piece of steel, for example, runs through the jaws of a radiation machine. On the upper jaw is a pellet of radioactive metal. On the lower jaw is a radiation detector which measures the amount of radiation getting through the moving sheet. The thicker the steel, the fewer the rays that get through. If a thin spot is reached, more radiation gets through. Thus deeply hidden flaws in the metal can be discovered and corrected before they cause harm.

In many cases, the signal caused by the radiation transmitted through the material is used to make automatic corrections in the production process. As a result, more uniform steel, copper, aluminum, paper, tin plate, plastics, rubber, and other materials are being produced.

This same principle has worked to improve the cigarettes you smoke. A lightweight cigarette burns both fast and hot, whereas cigarettes that contain more tobacco than necessary are hard to draw through and costly, since tobacco represents 90 percent of the production cost. The isotope strontium-90 is used to measure the density of the tobacco in each cigarette and to permit automatic adjustment of tobacco feed, contributing to the uniformity of the product.

Commissioner Willard F. Libby of the Atomic Energy Commission predicts that in the next five years sharply rising application of radioactive isotopes will lead to industrial savings of about five billion dollars a year. He adds that potential savings from their use in agriculture would come to about 200 million a year; and there is no financial yardstick to assess their value in saving and extending human life.

Lewis L. Strauss, chairman of the AEC, says, "We have every reason to expect that atomic energy will yield many more and far greater benefits to all mankind."

New uses for isotopes are being found constantly. AEC reactors have created some 900 different radioisotopes, and research indicates an ever-widening potential for their application in medicine, industry, and agriculture. Radiation sterilization offers the first promising new principle of food sterilization since discovery of the art of canning. And eventually we will get our power and light from nuclear fuels.

All of this adds up to the fact that the "peaceful atom" is not a mere dream for the future, but a reality in our time.