trating the tube. The penetrating ray rips the gas molecules and frees charged particles, called ions. This produces an electrical discharge.

When the discharge is amplified by the Geiger counter, you hear a click. Each time a ray penetrates the tube, it sets off the electrical discharge and you hear a click.

Even away from uranium and other well-known radioactive materials, there is some clicking. Powerful cosmic rays from outer space penetrate the tube and cause clicks. Some materials which are not thought of as radioactive may send out some radiation which can produce some clicking.

But normally, the clicking of the counter is irregular. You can count the clicks in a minute. When radioactive material is brought into the room near a counter, the clicks increase. They become a steady clicking, faster and faster as the material is brought closer. This is the atomic alarm system.

Lights rather than the audible clicks may indicate the counts. When the count is high enough to indicate danger from radiations to persons close to the counter a bell or other sound alarm may go off. Automatic counting devices can be installed to make a record of the rays counted.

Secret "Counting"

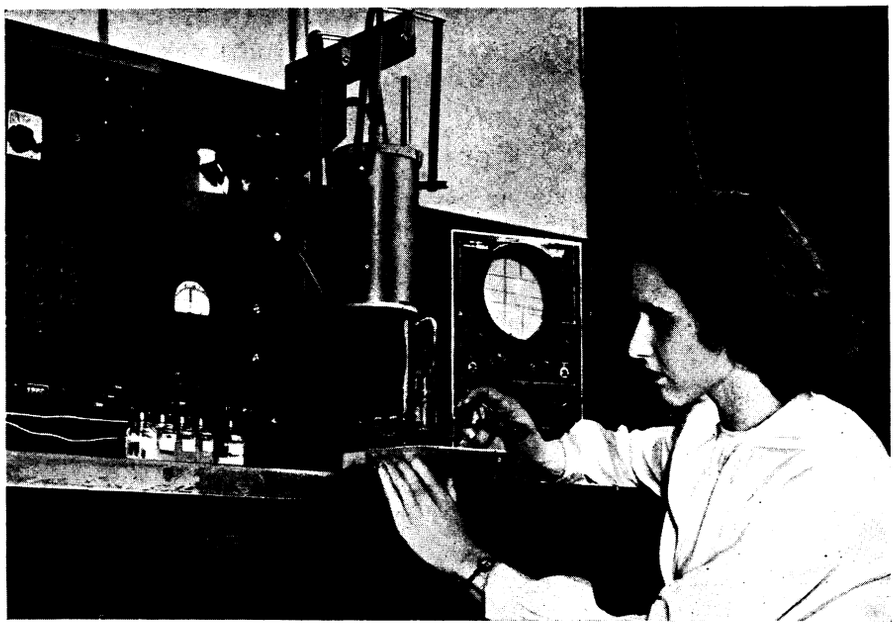
You may be "screened" for radioactivity without knowing it. Counters will probably be installed at some doors. The instrument could be camouflaged. If you walked through the door with a bit of uranium in a bag, the counter might set off a sound alarm system or a visual warning of radioactive material.

You will be "counted" many times for uranium in an age of atomic energy.

Geiger counters are used in nearly every stage of work with radioactive materials. Portable counters can be carried by prospectors searching for the stuff of the atomic bomb. A portable counter which weighs less than five pounds and has its own power from batteries is now on the market.

Science and industry use the counter in work with radioactive materials to help protect the health and lives of workers from the deadly rays.

The dangerous rays of radioactivity can be detected by equipment other than Geiger counters. But the Geiger counter is the most useful sleuth for tracking down the rays of uranium and other radioactive materials.



GEIGER COUNTER—This detector is being used to test for radioactivity in dust gathered after the Bikini aerial explosion last July.

A practical rival of the Geiger counter for some uses is the electroscope. It can indicate radioactivity and atomic bomb materials though it is rated less sensitive than the counter.

The simplest form of the electroscope has a gold leaf suspended from a vertical rod. When the rod is charged, the leaf stands out at an angle from the rod. As the charge of the leaf leaks away, the leaf swings down against the rod. The rate of swing indicates the conductivity of the air and can warn of the presence of radioactivity.

Electroscopes the shape and size of fountain pens were carried by workers on the atomic bomb project.

There are other detectors, which can warn of radioactivity, but they are chiefly useful to the scientist. He wants to know more than how many rays are counted. Science has other devices for research on how radioactive rays behave and other details from the life of an atom.

But for practical control of atomic energy—for locating uranium being transported illegally or warning of radioactivity attacks—the Geiger counter is our number one atomic sentry.

Science News Letter, June 14, 1947

METALLURGY

Oxygen, Man's Life-Breath, Speeds Steel Production

➤ OXYGEN, life-breath of man, can step up steel production, according to reports of the American Iron and Steel Institute.

The Institute reported that several plants for manufacturing oxygen are now under construction adjacent to steel plants. When the oxygen plants are in production, oxygen will find two important uses in steel production:

1. To increase the heat of the open hearth flame and save between 10% and 25% in fuel costs.

2. For stepping up the rate at which carbon is removed from the liquid metal.

Oxygen enriches the open hearth flame with increases in temperature of up to 500 degrees Fahrenheit. This can reduce the melt-down time as much as 30%.

Bubbling oxygen into the molten bath speeds the reaction which separates the carbon from the metal in liquid form. This can save from 17% to 30% of the time required for the process.

In addition to faster production of steel, better steel may result from the use of oxygen. Some metallurgists have reported better quality steel from the oxygen-enriched processes.

Science News Letter, June 14, 1947