

detrimental to the potato plants themselves. When mixed with lead arsenate and lime, however, the preparation had no damaging effects on the plant, and it gave very good results against the beetles.

Mr. Rippon is president of the physics and chemistry clubs at Burnham High School. He hopes to go to the University of Michigan to prepare for a career as a parasitologist.

### Tick-Tack-Toe Machine

Noel Elliott, 18, has designed and built an electronic machine that plays tick-tack-toe.

The human player gets the first move and the machine counters with a scientifically calculated move. These were set after the young designer had studied thousands of possible moves.

The machine, using a simplified version of the principles on which the large electronic computers are based, is not designed to win. Chances for man vs. robot are even but whenever its obstructive move goes into a winning square the machine is the victor.

Although tick-tack-toe is a very simple game, it was no simple matter to design a machine which would make all the correct moves. There are 362,882 possible games, and the circuits had to be so designed that the machine gives the correct reply in any situation.

The machine's moves are signaled by a light after the man has made his move by throwing a switch.

This device is not the first original machine Mr. Elliott has to his credit. The Kellogg, Idaho senior, who plans a career in electronics, has been building various kinds of machines since age 13.

*(To be continued next week)*

Science News Letter, February 25, 1950

### CHEMISTRY

## New Fire Extinguishing Chemical Gives Promise

➤ A NEW fire-extinguishing chemical under test at Fort Belvoir, Va., by Army engineers gives promise of being more effective than those generally used. It is a chemical of the bromo-fluorocarbon group.

Tests already made indicate that several compounds of the bromo-fluorocarbon group easily put out gasoline and electrical fires against which identical quantities of carbon dioxide or carbon tetrachloride were not effective.

The initial laboratory work on these compounds in fire-extinguishing was carried on at Purdue University, Lafayette, Ind. Tests are to verify laboratory data and to screen the candidate compounds. The final selection will have to be one that is not poisonous because the new agent will be used to fight fires in vehicles and other confined locations. Preliminary work indicates that several of them are not toxic.

The fluorocarbons constitute a relatively

new family of organic chemical compounds. They are similar to the hydrocarbons of petroleum but differ in that the hydrogen is replaced by fluorine. Bromo-fluorocarbons contain both bromine and fluorine.

Science News Letter, February 25, 1950

### ASTRONOMY

## Northern and Republican Irish Share Telescope

➤ NORTHERN Ireland and the Irish republic do not always see eye-to-eye but they are both part owners now of a new eyeglass that will soon be peering at the "hub of the universe" from the Harvard Observatory station in South Africa.

The new Baker-Schmidt type of telescope with the world's largest (33 inch) prism was accepted from Perkin-Elmer Corporation, Glenbrook, Conn., by Dr. Harlow Shapley, director, and Dr. Bart J. Bok, expedition leader, who will use it to explore the Milky Way more thoroughly than ever before.

Stars a hundred thousandth of the brightness of the faintest star visible to the naked eye will be captured photographically in 20 minutes with the new ADH telescope (A for Armagh Observatory, Northern Ireland, D for Dunsink in Eire, and H for Harvard.)

The program of Harvard astronomers using the new telescope is the first step in a five-year program to map and discover the center of the universe.

Science News Letter, February 25, 1950

### ENGINEERING

## Narrow Strips of Soils Test New Mine Detectors

➤ NARROW parallel strips of different types of soil are used in testing new mine detectors at the Army Engineer Research and Development Laboratories, Ft. Belvoir, Va., it is now revealed. The objective is detectors that will be usable on all types of soil.

Mine detectors may react differently with different soils. Most of the detectors are electric devices that are swept over the path of an advancing army to locate buried mines that explode when trodden upon. The detector sets up an electric field and this field is affected by any magnetic material over which it passes.

The most common mines are in an iron or steel container. When passed over by the detector, the electric field is altered enough to send a warning signal to the earphones of the operator. The detector, however, has little value if the soil contains iron ores, particularly magnetite, found in volcanic regions.

The narrow, side by side testing lanes of soil used contain many kinds of soil. They represent all the soils of the world, at least in type. They contain sand, clay, gravel, sandy loam, and many other soils. Mines, test disks and test blocks are buried in them at given depths.

Science News Letter, February 25, 1950



**VERSATILE DETECTORS**—New mine detectors are tested on narrow parallel strips of different types of soil. The aim is the perfection of a detector usable on different types of soil.