PHYSICS

Mothballs Have New Use

Crystals of the chemical give promise of a new method of detecting radioactivity. In some respects it is superior to the Geiger counter.

➤ MOTHBALLS promise to become important in giving warnings against dangerous radioactivity from exploding atoms or the detection of new facts about the composition of matter. They are competing with the famous Geiger counter, familiar detecting device of radioactivity.

The stuff of ordinary mothballs is finding a use in the detection and counting of speeding subatomic particles and gamma rays. Naphthalene (mothballs), anthracene, and alkali halides such as sodium iodide have all been successfully tested as detectors, according to recent investigations reported to the PHYSICAL REVIEW (July 1, Aug. 15), journal of the American Physical Society.

Counters using crystals of these compounds are called scintillation counters, and have characteristics superior in some respects to the familiar Geiger counter.

The scintillation counter is constructed by placing the sensitive crystals in front of the light-sensitive aperture of a conventional photo-multiplier electron tube. A high energy particle or gamma ray in passing through one of the crystals produces a tiny flash or scintillation of light. These flashes are seen by the photomultiplier tube and are converted to tiny electrical impulses. These tiny impulses are then in turn amplified nearly a million times in the photo-multiplier tube to give a usable output voltage pulse.

The advantage of the new scintillation counter over the more familiar Geiger counter lies in its very high speed of response. The slower Geiger counter has a dead time for a few thousandths of a second after each count before it recovers its sensitivity and is able to detect another particle. The scintillation counter, on the other hand, is so speedy in response that it can make several counts within a millionth of a second.

With the new counter such rapidly occurring events as the decay of a meson or of the energy transitions of a nucleus can be accurately observed and timed in order to supply important new information about the energy spectra of these processes.

Some of the latest reported researches on the new scintillation counters have been done at the University of California Radiation Laboratory, Oak Ridge National Laboratory, and Princeton University.

Science News Letter, November 13, 1948

MEDICINE

Boys' Heads Are Bigger

➤ WORRIED about the size of the baby's head? Does it seem too large or too small?

Usually there is no foundation for such worries, but physicians now have a simple new technique to make sure. A simple chart on head size has just been devised by two University of California Medical School physicians, Drs. Henry K. Silver and William C. Deamer, and published in the JOURNAL OF PEDIATRICS.

In most cases what appears to be an abnormally large or small head may be simply a hereditary characteristic. A few measurements over a period of time, using the chart, will determine if the head is growing at a normal rate, in which case there is no need for worry.

However, in a very few cases an abnormally small head may indicate mental retardation or on oversize head may warn of a dangerous increase in cerebral fluid and possible atrophy of the brain.

In these cases "changes in the growth pattern of the head, as compared to normal, may indicate the seriousness of the condition before marked abnormality of shape, loss of vision, retardation of mental growth or other sequelae have occurred," the physicians write. In many cases serious consequences may be averted.

The physicians point out that in the past it has been difficult for the average physician to take routine measurements of head size, because the data on head size have been buried in lengthy and complex tables, the interpretation of which is difficult and time-consuming.

Their chart is a graphic simplification of these tables, which makes it possible for the practicing physician to compare head size in an infant up to two years with that of the average child.

The chart indicates that boys have larger heads than girls at all ages. At birth the head size for girls ranges from 12.75 to 14 inches, while for boys the range is 13 to 14.25 inches. At two years the normal for girls is 18.25 to 19.5, and for boys, from 18.75 to 20 inches. In all cases 20% of all children will have head circumferences which fall on either side of these sizes without being abnormal.

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STREET LIGHTS GET "BRAIN"—The electronic "brain" which turns street lights on and off automatically at dusk or dawn is in the center transparent tube being demonstrated by a GE engineer.

ENGINEERING

Individual Street Lamps Lighted Automatically

➤ INDIVIDUAL street lights may now be turned on and off automatically as dusk and dawn approach by means of a small photoelectric cell unit which is designed so that it may be plugged into the top of a properly adapted lamp. The device was revealed by General Electric.

The use of photoelectric cells to turn lights on and off is not new and has been applied for some time with classroom lights in schools and also in other types of buildings. Another application is in the revolving beacon lights placed on aviation routes. This new application, with a specially designed equipment, should result in economy because the individual lamps are in operation only when it is dark enough to need them.

A gas-filled phototube, an electronic device sensitive to red light, is used as the brain of this automatic lamplighter. The type sensitive to red light was selected because the light of the setting sun in early evening is nearer the red end of the spectrum.

A little window in the housing over the photocell unit faces north and so is shielded from the direct rays of the sun. The phototube will operate when outdoor light intensity reaches a point at twilight when objects some 500 feet away become hazy to an observer.

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