

of increased power output, shorter pulses, directional antenna systems, and many other practical aspects of the problem.

Robert M. Page, of the U. S. Naval Research Laboratory, was assigned in 1934 to work on these problems. During the next few years he materially assisted in solving in quick succession the difficult problems of generating pulses of the proper length and shape, of building a receiver which would not be blocked by the transmitter pulses and therefore would pick up those extremely short pulses after they are reflected, and of designing cathode ray tube displays for the received pulses.

"The Army's first pulse radar was designed as a complete system at the Signal Corps Laboratories early in 1936," this report states. "By the end of 1936, echoes had been seen from radio pulses directed at commercial planes flying on a regular airway in New Jersey. By May, 1937, a successful demonstration against test bombers was carried on at Fort Monmouth. . . . The equipment not only detected the aircraft but passed an information about their direction, elevation, and range so that searchlights were pointing at precisely the right point when the aircraft came within range."

*Science News Letter, August 18, 1945*

#### CHEMISTRY

### Toothpaste Tubes Used To Measure Beta Rays

► TOOTHPASTE tubes, just beginning to reappear on drug store shelves since their war absence, have been put to a new and unusual use by Burrell W. Brown and L. F. Curtiss of the National Bureau of Standards.

The tubes have been converted by these scientists into Geiger-Muller tube counters for measuring beta rays, one of the three types of rays constantly emitted from radium and other radioactive substances.

This use was not responsible for the war shortage of toothpaste tubes, however. The Bureau of Standards scientists used the thin-walled, collapsible aluminum tubes now commercially available, not the prewar type usually made of tin and lead.

The Geiger-Muller tube counter consists of an insulated wire mounted axially in a metal tube maintained at a potential several hundred volts from that of the wire. Sensitive to very low intensities of beta radiation, it records each beta particle that passes through it by producing an electrical pulse which can be amplified and registered. Since beta

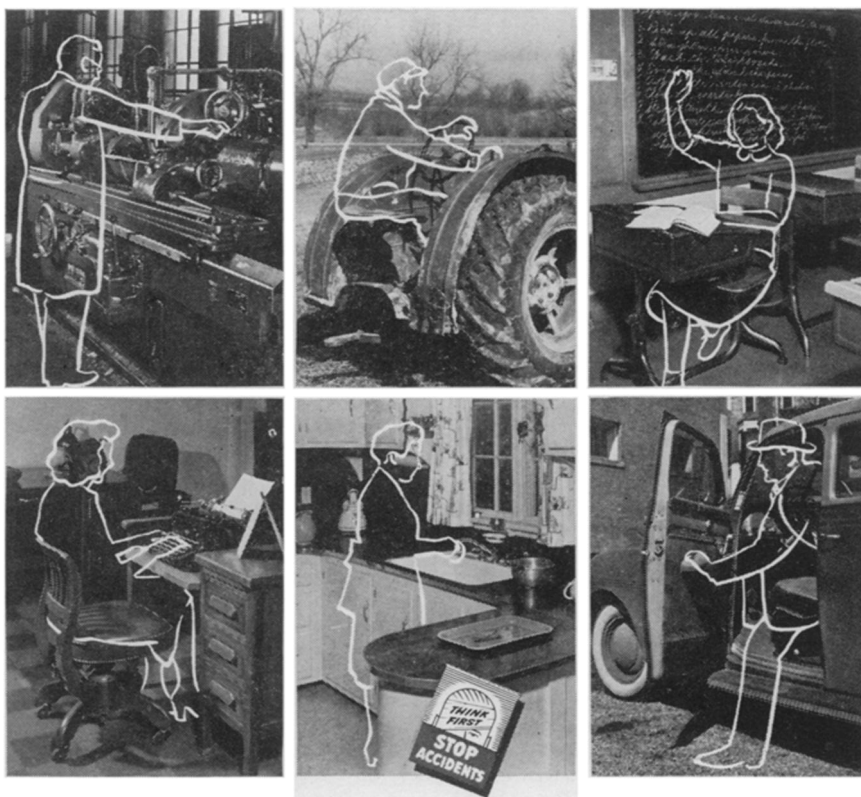
rays with energies as high as 1,000,000 volts can penetrate only a fraction of an inch of ordinary materials, the counter tubes must have walls which are very thin and of low density.

Most previous attempts to develop a suitable thin-walled tube counter have been laborious and expensive since the tube container must be gas-tight. The scientists have been successful in making excellent and relatively inexpensive counters by plating thin layers of copper on commercially available aluminum

tubes, and soldering metal plugs in the open ends of the tubes. These plugs support the insulators and glass tube for filling and sealing. The walls are only 4/1000 of an inch in thickness, which permits most beta rays to pass through and be recorded.

*Science News Letter, August 18, 1945*

The suckers of a *squid* are pneumatic in action, though in some species the hold is strengthened by a ring of horn-like teeth.



### Out of action...because they didn't see



More than 350,000 deaths, 1,300,000 permanent disabilities suffered since Pearl Harbor—more than the total of all casualties caused by enemy action—are due to accidents in traffic, at home, on the farm, at work. One reason for this appalling toll on needed manpower is faulty eyesight.

You may have visual handicaps of which you are not aware; or you may have vision ideally suited to certain tasks but not to others. Modern optical science has proved these facts, and has developed scientific techniques for correction of almost all visual defects.

"I didn't see" is a poor excuse for anguish to you or your family. Don't take a chance! Only a professional visual check-up can reveal the true condition of your eyesight.

Think first—stop accidents! Play safe—be sure your vision is right. Bausch & Lomb Optical Co., Rochester 2, New York.

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