RADIO

Station in Lipstick Tube

Broadcasts can now be made from the word's tiniest radio station, that will fit into a lipstick tube. Radio the size of calling card to make debut.

➤ WORLD'S SMALLEST radio station, complete with a tube and circuit which will fit in an empty lipstick container, broadcast for the first time recently in Columbus, Ohio.

A complete radio on a plastic card the size of a calling card will make its debut in New York next month to complete the vest-pocket radio transmitting and receiving unit.

Dr. Cledo Brunetti, an electrical engineer at the National Bureau of Standards in Washington, demonstrated his tiny but complete broadcasting station to the Columbus section of the Institute of Radio Engineers.

He predicts that the printed wire process which makes his midget radios possible can reduce the cost of wiring radios 30% to 60%. Wiring cost, he adds, is a big item in the price you pay for a radio.

Vest pocket radios even may come with the vest of the future. Dr. Brunetti says that complete radio circuits can be printed on cloth.

The inch-long broadcasting transmitter and the "calling card" radio have been developed from the wartime proximity fuze which had a complete radio sending and receiving station to explode shells accurately near enemy planes. This was made possible with printed wire.

Instead of the complicated copper wires in your home radio set, the proximity fuze and Dr. Brunetti's radios use lines of "silver ink," a solution of fine silver or silver oxide, painted over a stencil to form a two-dimensional circuit. The carbon resistors are painted in over another stencil with a carbon solution to complete the circuit.

To complete a radio set, tiny tubes are soldered onto the printed circuits. Dr. Brunetti's lipstick container-size radio station has the circuits painted on a small tube.Tiny batteries from a hearing aid and a small microphone round out the complete equipment for the world's smallest radio station.

In addition to the inch-long broadcasting unit, Dr. Brunetti demonstrated two other transmitters. His "larger" transmitters have the midget tubes mounted on small plates. One of the plates with the printed wire circuit is about the size of half dollar.

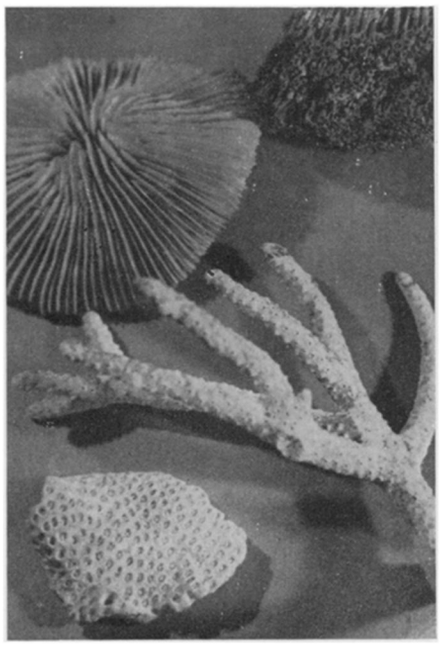
The first broadcasts were made with special permission from the Federal Communications Commission, the agency which may be faced with the problem of regulating broadcasts from pocket-size radio stations in the near future.

Dr. Brunetti was one of the pioneers in the work on printed wire for the proximity fuze. The process is now produced commercially by the Centralab division of Globe-Union, Inc., Milwaukee, Wis.

First large-scale peacetime use of printed wire may come for hearing aids. A hearing aid, with miniature tubes and ordinary batteries, has been produced with a circuit one inch high and two and one-half inches long. Dr. Brunetti expects these units to be on the market in a few months.

Wires without wires for the proximity fuze were produced with stencils on ceramic plates. Research at the National Bureau of Standards since the war ended has revealed new methods of applying the process on many different materials.

Science News Letter, February 22, 1947



PHOTOGRAPHY AID—Pictures help toward understanding of science, is the thesis advanced by Miss Robin Cooley, 17, of the Albany (N. Y.) Academy for Girls, Science Talent Search winner. She enforces her point in her winning essay with this picture of several forms of coral.

PLANT PHYSIOLOGY

Chlorophyll Retains Light

➤ ONE OF THE mysteries of photosynthesis has been solved by University of California chemists. They have shown how chlorophyll holds on to light energy long enough for it to be stored in plants as sugar, starches, and other substances.

Photosynthesis is the process whereby nature maintains all life on earth. In this process carbon dioxide and water are combined, with the help of chlorophyll, the green pigment in plants, into the energy substances such as sugar.

The Berkeley scientists have shown that chlorophyll has a phosphorescent quality. Earlier they had demonstrated that phosphorescing molecules are in a magnetic state. The shining of a light on these molecules literally boosts them up to this state, and they retain the light until they lose their magnetism.

This fundamental principle, one of the last scientific contributions of the late Prof. G. N. Lewis, was demonstrated by suspending a fluorescein-containing glass between the poles of an electro-magnet. A strong light thrown on half of the glass made it swing quickly toward one of the poles, showing the fluorescein molecules had been magnetized.

Dr. Melvin Calvin, associate professor of chemistry on the Berkeley campus, who had been collaborating with Prof. Lewis, carried the work over into photosynthesis. He found that the phosphorescent state in chlorophyll lasts for about a tenth of a second, about 10,000,000 times as long as the non-phosphorescent state retains light. Thus there is plenty of time for the conversion of this light energy into the many organic energy substances found in plants.

Dr. Michael Kasha, research fellow in chemistry, and Gus Dorouch, graduate student, assisted Dr. Calvin.

Science News Letter, February 22, 1947