

RADIO

Printed Wire for Radios

Commercial application of this wartime research is about to become a reality. Flat lines for easy production are development from proximity fuze.

► **FIRST COMMERCIAL** application of the revolutionary wartime development, printed wire, may soon find its way into new radios.

The flat, printed lines, which take the place of the complicated copper wires in your own radio, are now being used to form small, rugged interstage coupling plates. These plates connect the amplifying tubes of a radio.

Printed wire plates are being manufactured by the Centralab division of Globe-Union, Inc., Milwaukee, Wis. This firm produced printed wire circuits for the proximity fuze. At least one large radio manufacturer is understood to be planning to use the printed wire plates in home radios.

Claimed to be the first commercial application of printed wire, the coupling plates have only four soldering connections, compared with nine in standard wiring, and are smaller units, more easily incorporated in radios.

Printed wire is formed on a flat surface with a solution which dries to form lines. These lines are composed of silver in place of copper wires, and carbon is used for resistors in printed wire electronic circuits. Advantages claimed for printed wire are rapid, comparatively easy production, smallness of size and rugged construction, compared with wiring.

Printed wire was developed late in the war for use in some of the models of the proximity fuze. Since the war, scientists at the National Bureau of Standards have developed the "lipstick broadcasting station," the "calling card radio" and other tiny equipment utilizing printed wire, but the coupling plates are the first product to come on the market.

Meanwhile, scientists at the Bureau of Standards fear that America may be lagging behind the British in developing applications of printed wire. Sargrove, Ltd., of London, is reported to have produced an assembly-line type machine for turning out printed wire circuits.

Latest American achievement with printed wire is a complete radio transmitter smaller than a pack of cigarettes.

The broadcasting unit is seven-eighths of an inch by two inches by two and one-fourth inches. The tiny radio station was developed by Dr. Cleo Brunetti and his associates in the Ordnance Development Division of the Bureau of Standards.

Two-thirds of the midget station's size is due to batteries. Dr. Brunetti predicts even smaller batteries may be developed. The lipstick broadcasting unit, developed by Dr. Brunetti's group, had lines painted on the tube to replace wires, but it required separate batteries.

Dr. Brunetti reports that his office has received many reports from manufacturers working on printed wire developments. After components for radios, such as the coupling plates, he believes a personal radio with a broadcasting and receiving station, small enough for a coat pocket or handbag, will be put on the market.

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EVOLUTION

Man Owes Civilization To Adaptability of Mind

► **MAN IS MAN** because he is plastic—mentally.

Man owes his distinctive place in the world, his separation from all his animal kindred, to his inheritance of an adaptive mental pattern. Human beings do not have to respond to a situation in a rigidly predetermined way, as bees, wasps and ants do.

Dr. Th. Dobzhansky of Columbia University and Dr. M. F. Ashley Montagu of Hahnemann Medical College in Philadelphia explain this plasticity in human behavior in *Science* (June 6).

Man solves problems of life never before experienced. This ability is tied in with man's highly developed nervous system, and especially with his big brain. Organisms with "one-track" behavior patterns have far less complex nervous systems, the two scientists state.

Big brains came early in human development. Beetle-browed Neanderthal man had a brain somewhat larger than modern man's, though differently shaped.

ed. But more important than size or shape of brain is what can be done with this equipment. The two scientists point to the well-worked flint tools of half a million years ago which are specialized types intended for different jobs. They are evidence that the distinctively human trait of mental plasticity had already been well developed.

The scientists see no reason in man's evolution why various human races can't think the same way.

Just because different races have different skin colors and other structural traits that are not the same, Drs. Dobzhansky and Montagu contend that "it does not necessarily follow that they must also differ in mental ones."

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METEOROLOGY

Radio Waves to Give Facts About Air Masses Overhead

► **RADIO WAVES** may some day become probes used by weathermen in finding out what kinds of air masses are overhead and roundabout. From knowledge thus gained, they may be able to give more accurate forecasts of what's coming up next.

Newest thing in this field is the subject of U. S. patent 2,421,730, issued to Gilbert S. Wickizer of Riverhead, N. Y., and assigned by him to the Radio Corporation of America. Mr. Wickizer uses radio waves of high frequency—300,000 kilocycles and upward—sending them from stations at known distances apart, with the receiving station on a tall tower or even on a mountain.

High-frequency radio waves, of the so-called pseudo-optical group, are affected in their range primarily by the refractive qualities of the lower atmosphere, just as visible light waves are. Therefore by studying their signal strength on reception, Mr. Wickizer states, it will be possible to obtain data on the relative humidity, temperature and pressure gradients of the intervening air masses.

Some work in this field was done experimentally during the war by Army aerologists, but not all of their results have yet been made public.

Studies on the relations between lower-frequency radio waves and meteorological conditions have been under way for several years at the Blue Hill observatory of Harvard University, under the direction of Dr. Harlan T. Stetson.

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