SCIENCE NEWS

Science Service, Washington, D. C.

NEWSPAPERS BY RADIO

NEWSPAPERS printed in your own home may be a reality in the postwar world if new transmitting and receiving equipment now being offered to newspaper publishers comes into widespread use. Known for many years to engineers as facsimile, the system transmits eight full pages of tabloid-sized newspapers in one hour by radio from the newspaper office to receivers in the home.

Before the war, facsimile receivers cost about $75. Research, engineering and manufacturing studies made during the war should make it possible to offer these receivers, with wartime improvements, at an even lower cost.

At the newspaper office, news, maps, cartoons, advertisements, feature columns and other items that make up a newspaper are mounted on a sheet of paper, so that the end result looks the same as a page from a regular newspaper. This sheet of paper is fed into a machine, where is it scanned, line by line, by a photoelectric eye.

The scanning process does the same thing mechanically that you are doing right now as you read this story. It starts at one line, moving from left to right, then jumps to the next line and repeats the procedure, continuing until all the copy has been scanned.

Everything that the photo-eye sees is converted into electric impulses, then into radio waves by electronic tubes similar to those in a radio set. These tubes break up the picture seen by the electric eye into a series of dots, which are received in your home receiver approximately facsimile in size and at the same speed at which they are transmitted.

The printing is done by a swinging arm that moves back and forth across a roll of special white printing paper in the facsimile receiver, synchronized with the movement of the electric eye in the transmitter. A stylus at the tip of the moving arm sweeps across the paper, and by means of small electrical impulses oxidizes a series of dots in their proper sequence, just as the electric eye transmits them. The coating on the paper turns black on being oxidized, leaving a permanent record of the copy fed into the transmitter at the newspaper office.

The receiver can be turned on at a predetermined time, and after the printing is completed, it will go off, leaving the completed newspaper. All this can be done in the early morning hours while the subscriber sleeps, leaving the morning paper ready to be read at breakfast.

Several industrial companies are now actively engaged in postwar planning for facsimile. One of these concerns, Finch Telecommunications, of Passaic, N. J., has just secured the services of a consultant to advise newspaper publishers interested in the development of facsimile as a part of their activities.

In addition to daily newspapers, weather maps, flash news, pictures, police reports showing descriptions and pictures of criminals, reports to and from planes in the air, data for ships at sea and many other types of material may be transmitted and received by facsimile equipment. Facsimile makes use of the same radio frequencies as FM (frequency modulation) broadcasting. This means that the area over which transmission is practical is more or less confined to the area visible from a transmitter antenna. Therefore, unless networks for fascimile are developed, this service will be limited to local areas.

ITEMS

COPIES of diffraction gratings, glass or metal with closely spaced parallel lines ruled on it, used in many types of spectrographs, are even better than the original gratings from which they were made, as reported by Dr. R. W. Wood, of the Johns Hopkins University, in the *Journal* of the Optical Society of America. Coarse gratings of 1,000 to 7,000 lines to the inch, which are especially useful for analyzing infra-red light, are first ruled on copper plates which have been polished as well as possible but can not be made as flat as polished glass. The collodion cast or copy of the original grating will reproduce faithfully both the carefully ruled lines and the small irregularities of the surface of the copper plate. But when this replica is pressed into contact with a piece of optically flat plate glass, the imperfections on the surface are "ironed out," leaving the replica with better optical properties than the original. Studies of light spectra with these gratings not only extend our knowledge of the behavior of atoms, but also have practical applications such as the identification of impurities in chemicals and metals.

A HEAT-RESISTANT plastic or synthetic rubber can now be made from a new chemical compound developed by the Mathieson Alkali Works. The new resulting material is expected to be of particular importance in electronics and, in general, wherever electrical insulation at high temperatures is required. It is under test in heavy duty tires on motor vehicles. The new compound is known as dichlorostyrene. The Mathieson rubber is made from it and butadiene. Tires made from this rubber are being tested on trucks and buses, and seem to be highly satisfactory. Dichlorostyrene is a chlorinated product. Its monomers are highly active and polymerize readily. The polydichlorostyrene resembles polysterene in chemical resistance, solubility and general appearance. It differs chiefly by its resistance to heat, and it is more resistant to water. It is stable and shows no tendency to lose hydrochloric acid.

ANTHRAX, for which no completely satisfactory treatment has yet been developed, may yield to penicillin, it appears from a report by Dr. F. R. Heilman and Dr. W. E. Herrell, of the Mayo Clinic at Rochester, Minn. In trials with mice, they found that slightly more than half the animals treated with penicillin could be protected against 10,000 times the lethal dose of anthrax germs even when treatment was not started until 16 hours after the mice had been inoculated with the germs. In other trials, starting treatment within an hour and inoculating fewer germs, all the treated mice survived and all the untreated ones died.