COMMUNICATION OF THE FUTURE?

Dr. G. C. Southworth, Bell Telephone Laboratories, New York City, stands beside the new experimental "piped" radio waves which travel inside the long tubes free from outside static and without interference to nearby receivers. In his hand Dr. Southworth holds a receiving unit which detects the electric waves after they race through the guide tubes with velocities near that of light. The electric waves used with the guide tube systems are only six inches long and are of the frequency that might possibly be used for television.

PHYSICS

Scientist Predicts Nature of Communication of Future

A BRIEF but amazing glance at scientific experiments which foreshadow what communication of the future may be like with radio waves only six inches long was presented before radio engineers and physicists by Dr. G. C. Southworth, Bell Telephone Laboratories, New York City.

Speaking, by invitation, before a joint meeting of the American Physical Society and the Institute of Radio Engineers holding their spring meetings in Washington, D. C., Dr. Southworth described his studies of a new form of wave propagation along guide lines. The electric waves used were of extremely high frequency and, indeed, beyond any wave frequencies used for communication today. The fundamental nature of Dr. Southworth's waves makes them akin, in one sense, to radio waves but instead of being broadcast in all directions through space they travel along specially constructed guides from point to point.

But before jumping to the assumption that the guiding system is like a telephone or telegraph wire, warned Dr. Southworth, it should be realized that the wave guides are like nothing so far used for the purpose in communication. Instead of consisting of electrically-conducting wires, the wave guides are composed of hollow metal tubes. The waves travel along inside nine-tenths as fast as light on insulating material which will not conduct an ordinary electrical current.

The waves, being inside what is essentially a metal shield, have little external effect on nearby instruments and in turn are almost completely free from static and other noise troubles caused by outside interference. These two points alone indicate the difference between the present system and ordinary radio where interference between stations and annoyance from static are a major problem.

In his lecture, Dr. Southworth was wary of too-enthusiastic predictions about the immediate practical importance of the new system as a means of communication.

The following possibilities, even though in the future perhaps, cannot be overlooked:

1. The electric waves used are in the range of frequencies higher than television now uses.
2. With a decrease in the size of the guiding tubes the system should be practical for long distance transmission of the waves (communication).
3. A communication electric wave system free from static and outside interference, which conceivably could be "piped" from place to place and interlace in a fashion not greatly different from the network of telephone wires now in use, might be built.

For Short Distances

"The situation at present," declared Dr. Southworth, "is that the art at these extreme frequencies is not yet at a point which permits a satisfactory evaluation of practical use. However, for short distance transmission or for use as antennas or projectors of radio waves or for selective elements analogous in nature to the tuning elements so commonly used in radio, there are not the same economic conditions limiting the size of the structure. For such uses, then, structures of this type (wave guide tubes) deserve serious consideration."

The electric waves used in the Bell Laboratory experiments were 15 cm. in length, or about six inches. Special types of radio oscillators, known as Barkhausen tubes, are used to generate the short waves.

For detecting elements at the other end of the experimental guide tracks, Dr. Southworth used a trap-like chamber in which was inserted a variation of the old-fashioned crystal and "cat's whisker" detector. The tiny current picked up by this detector was led to a sensitive galvanometer which measured the intensity of the current.

What surprised the physicists and radio engineers who listened to the lecture was Dr. Southworth's statement that "there is no return current path, at least of the kind that is commonly assumed in ordinary transmission."

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Lateral curvature of the spine occurs in eight girls to one boy.

Experiments indicate that cured cheese can be fast-frozen and defrosted without injuring the quality.