

PHYSICS

Very Short Radio Waves Travel Record Distances

Warm Air Over Colder Masses Called Cause of Unusual Transmission at Harvard of Waves Under 3 Yards Long

VERY short radio waves, only a few feet in length, have traveled record distances in Harvard experiments and warm air currents riding above colder air masses are believed to be responsible.

Using a $1\frac{1}{4}$ meter wavelength, signals have been exchanged between a Cambridge experimental station and one at Mt. Wachusett, Mass., a distance of 68 miles and probably a record for $1\frac{1}{4}$ meter transmission.

Another record for $2\frac{1}{2}$ meter transmission, is believed to have been established in the exchange of signals by the Blue Hill observatory and a station on Mt. Washington, N. H., a distance of 142 miles.

These unusually successful results are probably due to temperature inversions, according to Prof. Charles F. Brooks, director of Harvard's Blue Hill meteorological observatory, who has had a leading part in the university's ultra-high frequency radio research.

Ordinarily, air temperature drops with increase in altitude, temperature inversion occurring when the regularity of this fall in temperature is interrupted. Inversions are common at night, when the lower air is chilled. They are also caused by a warm current of air flowing above cold air near the earth or by a unusually cold current flowing close to the ground under warmer air at a moderate height.

There is a possibility of temperature inversion at four levels, says Prof. Brooks; in the Kennelly-Heaviside region; at the base of the stratosphere; in the middle of the troposphere; and near the ground. Only the last two, however, seem to be of consequence in ultra-high-frequency transmission.

It is Prof. Brooks' theory that when a temperature inversion occurs, the radio waves which spread horizontally through the atmosphere are refracted in passing from cold or relatively dense air into a layer of warm or light air. This refraction is similar to, but very much less than, the refraction of a

beam of light which passes from water into air.

Additional observations by G. W. Pickard, research associate at Blue Hill, on transmission and reception of 5 meter wave signals, showed that there is a well defined daily change in signal strength, with good reception during the night, best reception during morning and evening, and poorest reception near noon. His automatic records also indicate that there is probably a seasonal fluctuation, with best transmission during the summer.

The usual summertime inversion of temperature over the cold waters off the coast of Maine is believed to have been responsible for two exceptionally long distance transmissions of 5-meter signals last summer.

One was a signal sent from Blue Hill and picked up in a boat off Mount Desert Island, Me., more than 200

miles away. Later in the summer, 5-meter signals from West Hartford, Conn., were received on Mt. Cadillac, Mount Desert Island, Me., a distance of almost 300 miles.

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PHYSIOLOGY

Boy With Hairy Coat Studied in Kharkov

A SO-CALLED "dog-boy" like the famous Jo-Jo exhibited by Barnum many years ago is living in the city of Kharkov, U. S. S. R.

The child is entirely covered, face and body, with long blond hair having somewhat the texture of goat hair, coarse and a little wavy. He is being studied in the children's hospital and clinic in Kharkov.

The child is now four years old and according to the last report is in good health except for a case of rickets for which he is being treated. He is normal mentally as well as physically. Both parents and the boy's older sister are normal in every respect and no similar condition has occurred in any member of the family on either side, so far as the parents know.

The condition is known to scientists as hypertrichosis universalis. It is a con-



RARE DEFECT

This little lad, like Barnum's famous Jo-Jo, suffers from an inherited defect.