

EXPERTS PUZZLED BY EFFECT OF SUN'S ECLIPSE ON RADIO

WGY'S Short Waves Vanished When Eclipse Dimmed the Sunlight—3 Days Later KDKA Sent 63-Meter Signals in Daylight to Australia.

RADIO research engineers hoped that the delicate instruments in tune with the ether during the eclipse of the sun would solve some of their problems, but instead new complications have arisen.

During the eclipse, from 8:45 to 9:51 A. M., the seventy-five meter signals broadcast by 2XI, Schenectady, faded to inaudibility in the laboratory of the Radio Corporation of America, located in Van Cortlandt Park. An examination of the chart made of the incoming signals seemed to show that the low waves traveling 180 miles from Schenectady to New York are entirely dependent upon sunlight.

Three days after the eclipse the short wave transmitter of KDKA, Pittsburgh, flashed sixty-three meter signals through bands of daylight and darkness over 2,000 miles to Australia. This would make it appear that the low waves are not entirely dependent upon daylight. Further tests will be made and it is understood that attempts will be made to determine from which direction the short waves traveled from Pittsburgh to the other side of the globe. It is explained that they may have followed an indirect route in which daylight predominated.

Marconi's Observations.

Marconi in one of his lectures said: "The question as to whether it would or would not be possible to send radio signals around the earth as far as the antipodes has always fascinated me."

He explained that he thought signals from great distances do not always retain their direction in one great circle, but reach the receiving station from various ways around the earth. He called attention to the fact that observations made by means of a loop antenna (direction finder) near the antipodes indicated that wireless waves from England and Germany arrived from all directions. Similar experiments made in New Zealand showed that the messages from station POZ, Nauen, Germany, traveled by way of the South Pole, while signals radiated from the aeriads of Hanover, Germany, appeared to arrive by way of the North Pole.

A French experimenter cruising about the ocean near Australia made observations to determine the strength of European radio signals and he found that the waves from Lyons, France, were much stronger when the receiving station was exactly on the opposite side of the globe from Lyons. The same was true of signals from Nantes, France, when the receiving set was exactly at the antipodes of Nantes.

The conclusion was that the waves curve around the earth in all directions from the transmitting station, so the French signals reaching Australia came across the American Continent and also over Europe. At the antipodes they seemed to meet and reinforce each other, making signals stronger at that point. It is believed that this may have happened to the short waves radiated by KDKA.

Dr. Alfred N. Goldsmith, chief broadcast engineer of the Radio Corporation of America, who was in charge of the experiments at Van Cortlandt Park during the eclipse, explained that it was clearly apparent that the seventy-five-meter signals traveling the distance from Schenectady to New York followed the sun. He pointed out that the performance of short waves is very erratic and a different wave length might be effected differently by sunlight and also by distance. A sixty-three-meter wave might not be absorbed by the sun's rays and therefore it would be capable of traveling much further, as did the signals of KDKA.

The 350-meter wave length used regularly for broadcasting from WGY did not fade during the eclipse, but became as steady as a typical daylight signal.

Dawn has a greater effect upon radio waves than any other period of the day, because of the rapidly changing conditions of the atmosphere. Everything seems to "go dead" for an hour at dawn. Signals fade and swing more at that time than at any other time of day or night. During the eclipse tests WGY's 250-meter signals were put on the air at 8 A. M., and they faded, as they are accustomed to do daily. At 8:30 A. M. the signals became steady and continued that way until 9:15, when the sun appeared again over New York. Then they waxed and waned as they did before the darkened effect of the eclipse was noticeable. The fading continued until 10 o'clock, when the waves again became steady as they do daily.

Cause Of Fading.

Fading is thought to be caused by the meeting of a sky wave and a ground wave which causes an interaction. If some force, such as the eclipse, hinders one of the waves from meeting the other, there is no interaction and the fading stops. That is what is thought to have happened during the eclipse. The sky wave from WGY, believed to travel along a Heaviside layer of rarefied air about sixty miles above the earth's surface, may have been affected because the absence of sunlight had an effect upon the mirror-like layer. The ground wave is calculated to travel about ten miles above the earth's surface, and it is not influenced by the Heaviside layer. It is thought that the interaction of sky and ground waves from WGY, KDKA

WOC CHANGES SCHEDULE.

SEVERAL changes will be made in the broadcasting schedules at WOC, Davenport, in the near future. All forenoon schedules and broadcasting of market reports will be discontinued. Those in charge of the Davenport station feel that the complete market service offered by Chicago and other Midwest broadcasters justifies this change, and WOC will devote its efforts to broadcasting of educational material and home-making hints, and evening programs of an entertaining and instructive nature.

It is quite probable that one of the contemplated afternoon schedules will include a weather forecast and Standard Time signals. Another of the contemplated changes is on the daily chimes concerts. It is proposed to broadcast these concerts in the evening at 5:45 o'clock, Central Time, instead of at noon, as has been the custom in the past.

Cincinnati claims to have become the largest city in radio production in the formation of the Kodol Radio Corporation through the consolidation of the Automatic Electric Devices Company and the Kodol Manufacturing Company.

and WEZ, three stations that swing in and out of New York more than any other stations, is the cause of the fading during regular broadcasts.

Some believe there is a "wireless screen" around the earth formed by solar dust far up in the earth's atmosphere. This is based on the theory of Sir Oliver Heaviside, an English scientist.

Fading is seldom noticed unless the transmitting station is over 100 miles away. The Heaviside theory suggests that the layer of electrified and rarefied air acts as a reflector of ether waves. Dr. Alfred N. Goldsmith has likened this layer to a copper sheet suspended above the earth. Owing to natural causes the reflecting power of the conductive sheet varies from time to time, in the same way a mirror reflects well at one minute and then becomes dim, when a person

breathes upon it. The mist or layer of air formed over the face of the earth, and also sunlight, seems to mar the reflecting power of the Heaviside layer. Fading is more apparent on short wave lengths. As the Heaviside layer becomes an excellent reflector at night the signals become louder, and that is why programs from long distance stations are often as loud as those of local broadcasters.

Radio receiving tests conducted by the General Electric Company during the period of the sun's eclipse have been compiled and reveal that there was no change in signal strength on either long or short waves broadcast over the band of darkness.

A signal on a 50-meter wave with an antenna output of two kilowatts was transmitted from an experimental laboratory at Schenectady before, during and after the eclipse. This was received at the Radio Corporation's station at Riverhead, L. I., on the opposite side of the belt of darkness, and no change in the intensity was noticed, even when the sun was totally eclipsed.

Long wave signals were received by General Electric engineers across the belt of darkness from WOR in Newark, which transmitted on 405 meters. No change in the intensity was noted at any time Saturday morning.



RECORDING RADIO SIGNALS DURING THE ECLIPSE OF THE SUN. Instructors of New York University, A. O. Busse and Robert Borden, made permanent records of Major Hensley's description of the eclipse as seen from an airplane, which was rebroadcast by WJZ.