

Sun-Spot Tornado Disrupts Cables, Phones and Telegraph for 5 Hours

Electrical Disturbance Plays Havoc With the Short-Wave, 1,000,000 Easter Messages and Police and Press Teletypes

Something akin to a "great tornado" brought out huge spots on the surface of the sun yesterday, creating an electrical bombardment that played strange and devastating tricks on communications systems throughout the United States and disrupted radio and cable service between America and Europe.

There was nothing in the freak disturbance during the daytime hours, when the trouble was worst, that could be seen by human eye or felt by human hand, yet somewhere in celestial space a brilliant display of aurora borealis, or northern lights, was apparently in progress, and among the results down on earth were:

Disruption of a large part of long-distance telephone service throughout the country.

A virtually complete "blanking" of short-wave radio communication between the United States and Europe, and partial disturbance of service to South America.

A crippling blow to telegraph service for five hours on a day when the lines were bogged down with Easter messages.

Upsetting of normal communication service in many other fields, including teletype machines in newspaper offices, State police headquarters throughout New York and New Jersey, airports and railroads.

Interference with services generally was most serious for five hours, between 10:30 A. M. and 3:30 P. M., though intermittent disturbances were felt for several hours thereafter. Later in the evening re-

ports were received that the disturbances were starting up again.

Toward the end of an upsetting day a great many opinions had been voiced by engineers and astronomers concerning the effects of the sun spots upon the earth, 92,930,000 miles away. William H. Barton Jr., executive curator of the Hayden Planetarium, said he could not remember when sun spots had caused more serious disturbances, and veteran electrical engineers unhesitatingly pronounced it the worst thing of its kind within their memory.

A technical explanation of what had occurred was provided by Mr. Barton, who also went on the air over a nation-wide radio hook-up early last night to tell the entire country about it.

First, he explained, the "tornado" or "twister" occurs on the sun. Yesterday's disturbance, he said, brought out seven spots, one of which, located toward the center of the sun's face, was a particularly large one composed of five smaller clusters.

The disturbance then bombards the earth with a stream of electrical charges.

The earth's magnetic force deflects this stream of charges toward the North and South Poles, and the stream, on its course toward the poles, disrupts other electrical currents traveling at right angles, just as conflicting streams of traffic would disrupt one another.

This force is so strong that it is

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SUN-SPOT TORNADO UPSETS TELEGRAPH

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capable of reversing the direction of current in a circuit; that, Mr. Barton explained, is what happened yesterday to certain telephone and telegraph lines.

He added that the theory of the aurora borealis, which is a sort of natural "neon tube" sign, following sun spots is of tremendous interest to astronomers. Though it is generally believed that the aurora borealis follows sun spots, astronomers are constantly on the lookout for additional proof to support that theory. Hence, observers at Hayden Planetarium were on the lookout last night for signs of the Northern lights.

Shortly after 9 P. M. Mr. Barton reported that the aurora borealis was visible in the northwest in the form of green streaks of light. Overcast skies later in the evening prevented the demonstration from becoming more plainly visible, he said.

Captain Stanley T. Stanton, pilot of a Transcontinental and Western Air Lines plane from Kansas City that arrived at La Guardia Field shortly after 11 o'clock, reported having seen a display of lights in the northern sky just after he passed Columbus, Ohio, at 8 P. M. Whereas the usual display of northern lights is fan-like in shape and of constantly varying color, the display reported by Captain Stanton was pale green and seemed to be spherical in shape.

At about the same time that the aurora demonstration began, the Planetarium received information from the longlines department of the American Telephone and Telegraph Company that the interference to its service, which had died down since late afternoon, was beginning to be noticed again, Mr. Barton reported. Other sources also reported spasmodic late interference.

Yesterday's solar cyclone obligingly provided its own "tip" to newspaper offices that something upsetting was about to occur. At about 10:30 A. M. teletype machines in the offices, which bring in the news from all parts of the country, suddenly went "haywire." Instead of rational messages, reports would come in like this:

NTET UVITVETTETVIVM
MMVOTXGKMKVKKIE
U XVUMVVHXQQ: TLLL
DVL WMLOOO

Operators grew frantic; the situation would have been much worse, however, on a weekday, when afternoon newspapers, with early deadlines, would have been crippled.

About the same time at State police headquarters throughout New Jersey and New York State (the New York City Police Department reported that its teletype stayed in perfect order) began playing similar tricks. The interruptions would come in waves; first a message would come through and then the machine would begin jamming.

Long-Distance Lines Suffer

Finally, in one of the clear moments, the New Jersey police got an explanatory message through on its teletype system. It blamed everything on the aurora borealis. The message said:

"To all receivers—Teletype lines have been affected by the aurora borealis for the past several hours. This was a general condition throughout the State. Apparently cleared up at this time."

Far more serious consequences, however, were taking place elsewhere. The American Telephone and Telegraph Company, largest owner of land lines in the country, reported through local officials that all of its long-distance connection to parts of the United States as far west and south as San Francisco, Denver, Omaha, Kansas City and Dallas were disrupted; that all transatlantic radio-telephonic connections, including those with London, Amsterdam, Paris, Rome, and with steamships, were out, and transpacific radio telephonic service from San Francisco also was suffering. Seattle and Portland were cut off during part of the day; radio-telephone service to South America was cut off for about two hours during the afternoon, and service to Honolulu was still out late last night, officials reported.

Telegraph circuits were "very badly" hit, and a few points, such as Fargo and, in Canada, Winnipeg, were completely cut off, company officials said.

The disruption of the service did not mean complete shutting off of long-distance telephonic and telegraphic service, officials explained, as not all of the lines were affected. However, they said, "practically every long-lines office in the country was doing repair work."

"The disruption undoubtedly was one of the worst in history, though, fortunately, the effects were not too bad," an official commented. "If this disturbance had come on a weekday, when traffic was heavier, it would have been almost catastrophic."

Damage in City Unknown

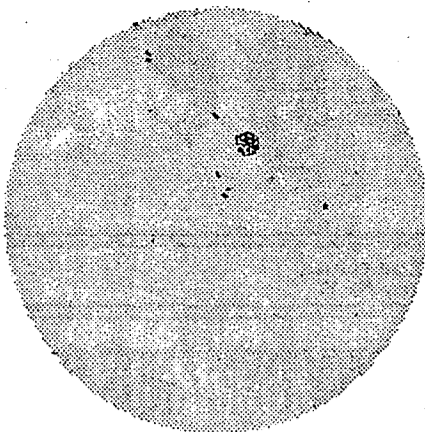
Telephone service in New York City, however, did not suffer, according to the New York Telephone Company. A spokesman said that a few of the teletype machines that it services were reported out of order. Most of the telephone company's teletype machines, however, are in business offices, the spokesman pointed out, and consequently the full extent of the disruption of service will not be known until this morning.

The Associated Press and the United Press were among those reporting serious consequences from the sun's tantrum. The Associated Press said its network of 185,000 miles of leased wires was out of use—except in a 500-mile radius around New York City—for four hours and ten minutes, while the United Press reported similar intermittent disruptions.

The Associated Press' 10,000-mile wirephoto network, over which pictures are transmitted on telephone wires, went out of order at 2 P. M. and still was not functioning normally three hours later. The special high-fidelity lines were clear for speaking, but on the sensitive picture transmission work the results were blurred.

Western Union reported that only the fact that many of its trunk lines are protected by metallic circuits, which are not grounded, saved it from a complete breakdown. As it was, many telegraphic trunk lines were disabled until crews of engineers were able to "build up" the affected circuits. The trouble came when the lines were clogged with 1,000,000 Easter greetings, thus creating something like pandemonium in the Western Union offices. Its Atlantic cables were cut off completely.

"This was the worst experience within the memory of our oldest



GENERATOR OF TROUBLE

Spots on the sun as they appeared yesterday afternoon at 3:30 o'clock when observed through a telescope by William H. Barton Jr., executive curator of the Hayden Planetarium, who made this sketch in scale.

traffic people," a Western Union spokesman said. "They are divided in their theories on what caused it. Some accept the aurora borealis theory, while others call that idea a lot of baloney. Some call it an 'act of God.'"

Measured 200 to 400 Volts

Postal Telegraph officials said they had not "seen anything like this in twenty-five years." The current of the electrical disturbance in the earth measured from 200 to 400 volts, they said. Their service, too, was protected in part by metallic circuits on some of the lines, but approximately 50 per cent of the circuits were affected at one time or another.

Most of the telegraph company engineers agreed that the disturbance had spent its full force by about 3:30 P. M., though intermittent, milder disturbances were noted occasionally after that time.

In the radio field Press Wireless, which receives short-wave news broadcast from Europe, reported that it was unable to make contact with Europe from 11 o'clock until 5:15 P. M., when it began to receive faint messages from Amsterdam. Mackay Radio and Telegraph Company said "all Europe has been 'out' since 11 A. M." R. C. A. Communications, Inc. said its short-wave connections with Europe were subject to fading and static, while South American connections, though not completely interrupted, were somewhat disturbed.

Long-wave radio was hardly affected. Engineers explained that in long wave transmission the wave follows the surface of the earth and does not encounter the electrical resistance found in the higher atmosphere.

The Columbia Broadcasting System said its early broadcasts of the Pope's message from the Vatican and a news round-up at 9 A. M. got through all right, but that short-wave reception during the rest of the day was halted. The National Broadcasting Company said it had to cancel its European broadcast at 3:30 P. M. The regular domestic programs were not interfered with, except in cases where telephonic hook-ups via landlines were disturbed, thus causing unusual static and interference. Both networks had to cancel 7 P. M. news broadcasts from Europe.

Railroads operating out of New York City also reported that telegraphic communication service was hampered during the "trouble period," but railroad service was not affected, because wire chiefs were able to build up other lines to facilitate traffic movement.

Planes Operated Safely Here

Teletype and radio communications at La Guardia Field, North Beach, Queens, also were affected between 11:20 A. M. and 5:30 P. M., airport officials reported. Radio messages faded out while being received in the control room. However, there was no interference with plane operations, since the control tower was able to maintain its short-wave radio within a radius of thirty miles, which was sufficient to keep normal contact with planes.

Some pilots on landing said that they had relayed messages from one plane to another; thus a plane some distance away from the airport would make contact with another plane near the airport and ask it to notify the field that the farther plane was coming in.

Discussing the sun spots, Mr. Barton explained further last night that he has seen larger spots, particularly during an electrical disturbance in January, 1933, when there was a spot large enough to be seen without the aid of a telescope. However, yesterday's spots were unusually violent in their manifestations, he added. An effort will be made at the planetarium today to obtain photographs of the spots if they are still visible, he stated.

The United Press reported that at Boston the earth current was measured at 400 volts; at Milwaukee, 450, and between St. Louis and Springfield, Mo., at 750 or more. Minneapolis reported that 90 to 95 per cent of its telephone circuits went out of service, and considerable trouble was reported in Chicago.

Physical damage to equipment in-

cluded burned-out insulation in many areas.

Services Crippled in Britain

Special Cable to THE NEW YORK TIMES.
LONDON, March 24—Unusually severe electrical disturbances, described as the worst in more than a year, badly crippled wireless and cable communication between Great Britain and North America for many hours this afternoon and evening.

The interruption in communications was caused entirely by electrical interference, not by government order, it was stressed by officials here. It was the worst communication jam of its kind since more than a year ago, when the aurora borealis played havoc with wireless and cables.

All services were affected. The wireless station went dead at 6 P. M. and remained completely out of contact with North America for several hours. Western Union officials said conditions were the worst in two years, with only one of seven cables functioning. Transmission was interrupted at intervals all afternoon. Earth currents at the sea bottom were believed to be the cause.

The Commercial Cables Company reported similar difficulties. One of its two cables was working only spasmodically.

Aurora Seen in Britain

LONDON, March 24 (UP)—Watchers on cliffs near Cromer saw the northern lights between 9 and 10 o'clock tonight. The sky turned scarlet, alternating with streaks of white, against a rising moon.

FLAKES ARE CRUCIFORM

Snow in North Carolina Takes Rare Shapes on Easter

Special to THE NEW YORK TIMES.
RALEIGH, N. C., March 24—The Easter snow here, which reached a depth of 7 inches by 6 o'clock tonight, was composed of an abundance of unusually rare crystals, Professor Charles M. Heck, head of the Physics Department of the North Carolina State College, reported. Some of the crystals were cruciform in keeping with the holiday, he said.

Mixed with the profusion of plates in this snow are long spicules characteristic of cold northern snows, Professor Heck said.

"But today so many of these

spicules have the rarer crossbar formation near one or both ends that one looking for a coincidence can find hundreds of perfect crosses, significant on this Easter Day," he declared.

Beautifully lined plates, joined together accurately and symmetrically by a short column, like those depicted by W. A. Bentley, the pioneer photomicrographer of snow crystals, are to be found in profusion, Professor Heck asserted. He said he had never seen them before in the South, where ordinarily fine, feathery, tree-like forms make up the bulk of the snows.

"Today, where a plate form tended to have at its edges the tree form, the branches are wide," he said. "Early tonight many of the plate forms are showing superdecoration, having tiny white balls formed along their edges and along the symmetrical pattern of ridges over the face of the plate. Among Bentley's published photographs I can find no such decorated plate."

The cause of the excess of peculiar forms in this snow cannot be explained, as the physics of the formation of so many and so beautiful forms in snow crystals is unknown, he pointed out. However, the fact that Raleigh has, as late as the Spring, a snow characteristic of the coldest snows of the Far North probably can be explained by the condition of the upper atmosphere, Professor Heck said.

"From the information reported by the Weather Bureau through the Civil Aeronautics Authority, very strong winds have brought air at high elevations from the Gulf at an angle that caused them to be deflected to an even higher altitude in crossing the Appalachians," he explained.

"Here they overran cold, moist air from the North. The snow formed at the high altitudes from the moist Southern air was of the Northern type on account of its low temperature at altitude. As they fell through air from the North, which also was cold, they maintained the characteristics of a Northern snow."

Professor Heck presented a paper yesterday at the Charleston meeting of the American Physical Society reporting the completion of the first year's continuous record, by means of the gigantic reflector system for sky radiation, of the rate of loss of the earth's heat to space.