

A TORNADO AT WATERTOWN, SOUTH DAKOTA, JUNE 23, 1914.

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A tornado occurred at Watertown, South Dakota, late in the afternoon of June 23, 1914. A large number of dwelling houses and barns were destroyed, telephone and telegraph poles were razed and many gardens ruined. More than a score of people were more or less seriously injured and a number of others were slightly hurt by flying debris. No one was killed outright, though one child was reported to have died of its injuries.

The writer was passing through the city on June 25th and spent the day collecting data relative to the storm. Had more time been available, further information could have been secured. However, it seems worth while to give a brief report of the tornado, notwithstanding the fact that the data are incomplete.

The Watertown Daily Public Opinion issued June 24th said: "People watched the approach of what looked like an ordinary thunder storm following a hot day* yesterday afternoon. Wind clouds formed about 6:30 o'clock and gradually developed into a heavy line to the north. The first indication of the formation of a cyclone was noticed in the continuous change of the light wind. Those watching next turned their attention to clouds forming fast in the northwest, and as a twister was developing the approach of the cyclone which went through the city was noticed.

"The path of the storm embraced an area about three blocks wide the entire length of the city east and west. The worst section in the south part of town was in the three blocks north and east of the corner of Seventh avenue and Maple street S. From there the cyclone took a course east and a little northerly sweeping everything in its path and wrecking homes and barns between Third and Fourth avenues and Fifth and Sixth streets almost entirely. It continued across Seventh, Eighth, Ninth and Tenth streets E. and between Ninth and Tenth streets reached as far

*Mr. R. Q. Wood cooperative observer at Watertown reported the maximum temperature for June 23, 1914, as 83° and the minimum temperature 54°.

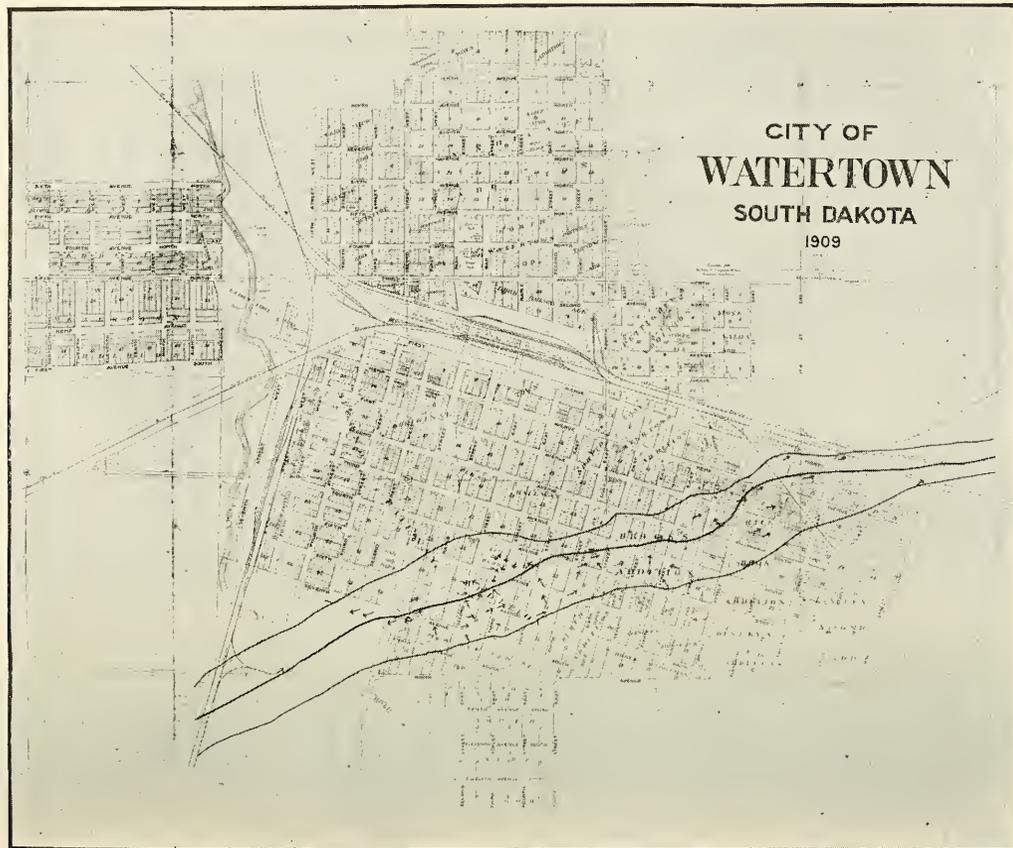


FIG. 1. Map of Watertown; S. D., showing path of tornado of June 23, 1914. See text for explanation.

north as First avenue N., badly wrecking homes on First avenue and Kemp avenue E."

In the issue of the same paper for June 25th there is a brief account of the storm at Goodwin, fourteen or fifteen miles a little south of east of Watertown where houses and barns were damaged. Some damage was also reported at Altamont, about ten miles south of east of Goodwin.

Mr. Ray stated that a thunder storm was approaching against a light east wind. At about 6:30 p.m. some hail fell, after which the temperature rose and a light east wind was blowing. About thirty minutes after the hail ceased falling, he noticed a great turmoil in the clouds and a funnel formed which struck the earth near the South Dakota Central roundhouse. (From this point the course of the tornado is indicated on the map shown in Fig. 1.)

When the tornado passed through the city Mr. Ray was at the Elks' Hall, four blocks north of the path of the storm. He stated that there was no wind where he was standing. After the tornado passed the wind changed to the northwest and blew hard. Fifteen minutes later a heavy shower occurred. The tornado passed through the city in ten or fifteen minutes. Mr. Ray had previously witnessed storms of this kind in Iowa.

Mr. Mitchell, agent for the Rock Island Railroad, stated that he first observed the storm over Pelican Lake, about one mile southwest of Watertown. It was traveling in a northeasterly direction and was drawing up water from the lake. Rock Island train No. 417 was pulling into town from the east at 7:05 p.m. The engineer saw the funnel and backed his train hoping to miss it. The train, however, was caught in the storm and had twenty-five panes of glass broken and the coaches were unroofed. One passenger who jumped from the train was injured by flying debris. The storm struck the city at 6:50 p.m. and was twenty minutes in passing through the city, a distance of one and one-fourth miles.

A number of persons corroborated these statements as to the length of time required for the tornado to pass through the city. Mr. H. Dietz stated that the hail came while a gentle southeast breeze was blowing and that there was little or no wind just before the tornado appeared. He saw the twister coming like a black smoke and it appeared to be about ten feet in diameter at the bottom. There was no rain or thunder or lightning accompanying the storm according to his testimony and this statement was verified by other persons questioned concerning it.

There were varying statements as to the presence of more than one

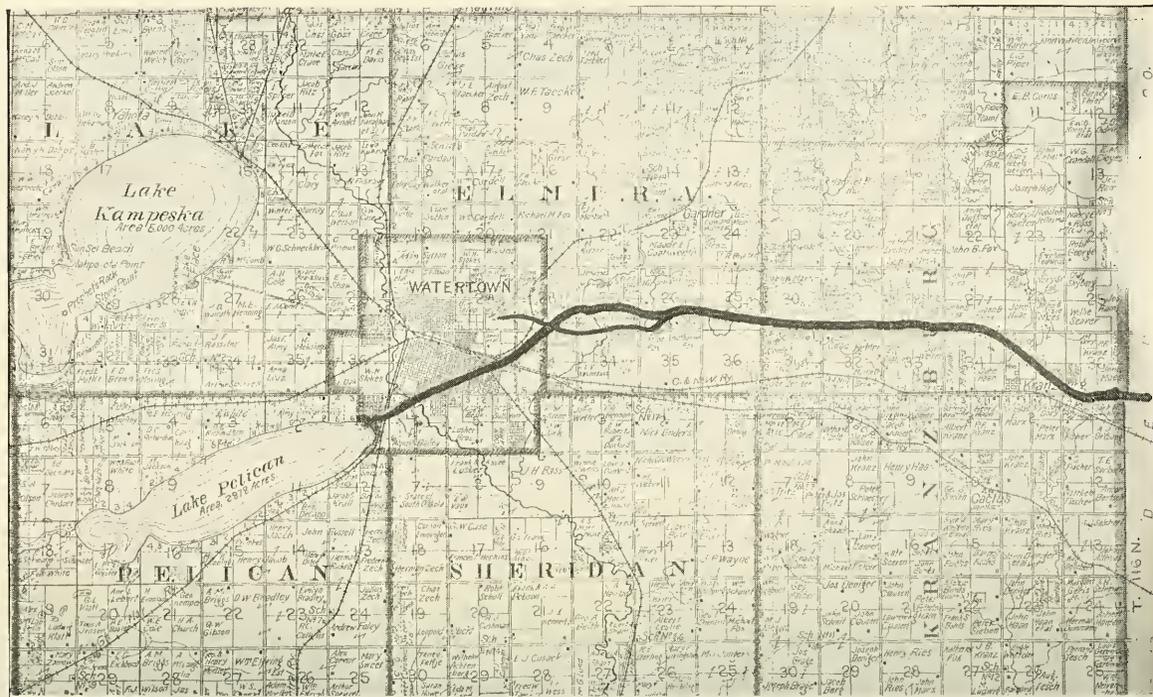


FIG. 2. Map of eastern Codrington County, S. D., showing path of tornado. The heavy dark line beginning at the northeast end of Lake Pelican indicates the path of the principal tornado. A lighter line crossing the heavy line at the eastern boundary of the city represents the path of the second funnel referred to in the text. Mapped for the writer by Mr. H. Mathiesen.

funnel, though a number of people said they observed one or more funnels which did not reach the earth. Mr. Dietz said that after the funnel left the city there was another one southeast of it which was white instead of black and that it dipped up and down but did not reach the earth. Mr. Mathiesen, who prepared the map of the storm's path through Codington County (Fig. 2), said that there were two funnels and his map shows the path of the second one, which, peculiarly, seems to have crossed the path of the main storm. He was at his farm about three miles east of Watertown and witnessed the storm as it passed by.

Mr. J. B. Kintsley saw the cloud just before it reached the city and he said that it seemed to be about the size of a box car and looked like a



FIG. 3. View showing wreckage of house in southwest part of Watertown, S. D. General character of houses indicated.

whirling column of mud. After the tornado passed by all of the clouds in the sky seemed to be rushing after it.

The writer carefully examined the path of the storm from the point where it entered the city to the point where it left the city and passed out into the open prairie. The two outside lines shown in Figure 1 indicate the boundaries of the zone of damage, while the middle line is the locus of points where the greatest destruction occurred. The small arrows indicate the direction in which objects moved as assumed from their position before and after the storm. The writer is aware of the fact that in cases where objects were moved for some distance the arrows may not indicate the direction of movement, but where houses were only moved slightly

from their foundations, and in similar cases, the arrows indicate the actual direction of movement. On the right of the axis of the path objects seem to have moved forward and to the left, while on the left side of the path they moved generally backward and to the right with reference to the advance of the tornado, although there are exceptions to this general statement.

Houses on the edges of the path had their chimneys damaged. In fact the outside lines might be designated the chimney lines. Inside the chimney lines, shingles were removed in patches and usually on the side of the house nearest the axis of the storm. Farther in more shingles were removed, porches were blown away, roofs entirely removed and in

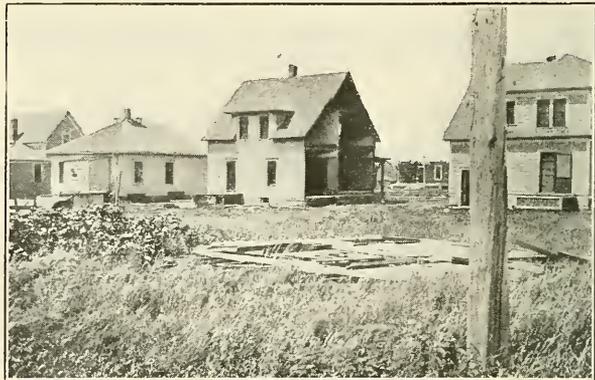


FIG. 4. House with end blown outward.

the middle of the path total destruction occurred, though not at all points. Greater destruction seems to have occurred on the right side of the storm path than on the left, and at some points the axis lies to the left of the middle of the path. The destruction seems to have been greatest where the storm entered the city and where it left it. The light construction of many of the houses in the part of the city traversed seems partly responsible for the damage. (See Fig. 3.)

The following incidents are of interest and may be briefly noted: The violent expansion of air in closed buildings was observed everywhere. Shingles were blown from roofs by the sudden expansion of air in the garrets. Windows were blown outward. Mr. Kintsley, who was in a cellar, said that the southwest window was the first one to blow outward.

Hollow cylindrical porch posts were split in at least one instance. Walls or foundations made of hollow cement blocks or hollow tile failed in many instances. (See Figures 9 and 10.)

The entire end of the house shown in Figure 4 was blown outward. The end of the house may be seen lying in the foreground.

Figure 5 shows a similar condition, though the house was greatly damaged otherwise.

Two boys who were in Oak Park in the southwest part of the city just outside the path of the storm said that when the funnel passed by it

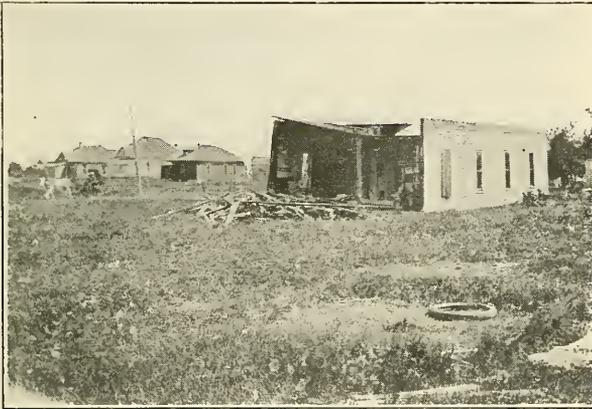


FIG. 5. House in east Watertown, S. D., showing explosive effect of air during passage of tornado.

looked like an elephant's trunk and that hot and cold blasts of air passed over them "sometimes hot enough to roast them and sometimes cold enough to freeze them."

At Goodwin, east of Watertown, clouds of soot rushed from the chimneys "as if everyone had a roaring fire." Here "the storm appeared to stay higher up in the air, though chimneys toppled and smaller buildings were overturned."

Figure 6 is from a photograph taken by Mr. Ward Carr who was at a farm house three miles west of Watertown. The tornado is moving toward the left and seems to be at the forward point of a crescent-shaped cloud. The writer does not know whether this is the squall cloud of the thunder storm or not. The hour-glass shape of the tornado is notable.

Figure 7 is from a photograph said to have been taken by a traveling salesman at the corner of Maple street and Second avenue south. This point is about four blocks north of the axis of the storm path. The other photographs were made by the writer.

The weather map of June 23, 1914, reproduced herewith (Fig. 8), shows the weather conditions prevailing on the morning preceding the storm. A trough of low pressure extends toward the southwest from a low central in Canada between an area of high pressure central in southern Alabama and an area of high pressure on the South Pacific States.



FIG. 6. View of tornado Watertown, S. D., June 23, 1914. Photo by Ward Carr.

All students of meteorology are familiar with the atmospheric conditions which prevail when tornadoes occur as well as with the usual freakish behavior of storms of this type. The writer has not discussed these points for this reason, nor does he wish to make a comparative study of this storm in this report. He has aimed only to state as many of the facts concerning this one meteorological event as he was able to ascertain in the brief time at his disposal, trusting that they may add a small part to the great fund of information already recorded concerning these small but violent atmospheric disturbances.

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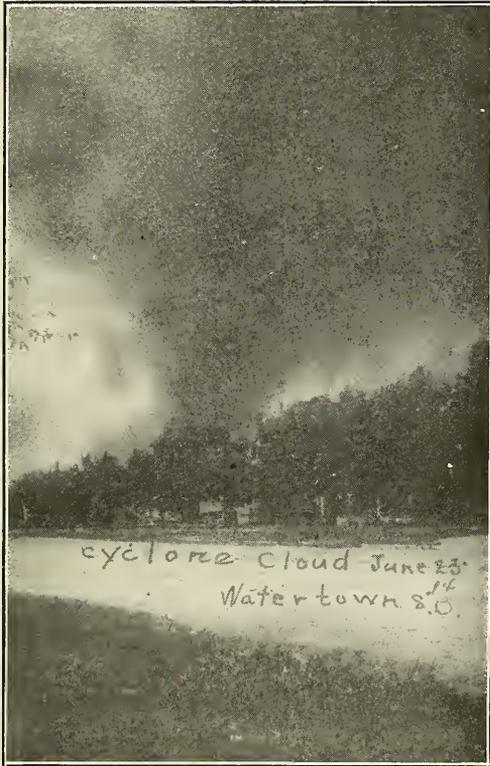


FIG. 7. View of tornado cloud, Watertown, S. D., June 23, 1914. Name of photographer unknown



FIG. 9. Collapse of hollow tile structure. Watertown, S. D., June 23, 1914.



Fig. 10. The house from the foundation in the foreground was carried bodily across the street and then dropped to the earth and broken to bits. Wreckage may be seen in front of cottage on the right.



FIG. 11. General view of wreckage where destruction was greatest.
Watertown, S. D., June 23, 1914.



FIG. 12. House moved from foundation. Watertown, S. D., June 23, 1914.



FIG. 13. House moved from foundation. Watertown, S. D., June 23, 1914.

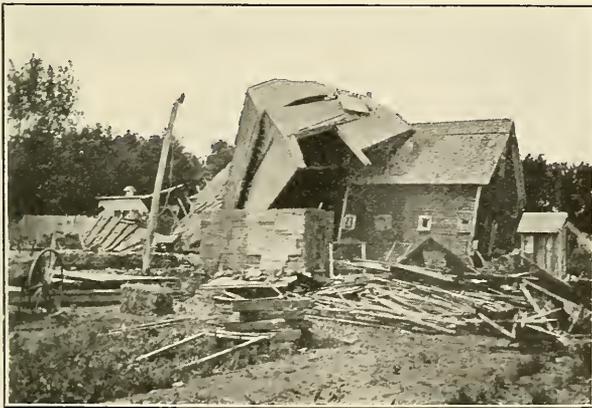


FIG. 14. Effects of tornado, Watertown, S. D., June 23, 1914.



FIG. 15. The tornado passed to the left of this house moving toward the reader. The porch was torn away and deposited in the rear of the house. Watertown, S. D., June 23, 1914.



FIG. 16. House moved from its foundation. Shingles stripped from roof. Tornado passed to the right of it. Watertown, S. D., June 23, 1914.