How a Zephyr Becomes a Tornado Strong Enough to Wreck a City.

An unusual number of disastrous atmospheric disturbances is predicted for 1906 by some scientists, who read of coming tornadoes, hurricanes and cyclones from the existing peculiar condition of sun spots.

February and March have already brought two destructive storms. Nineteen lives and property worth a million and a quarter dollars paid the tribute at Meridan, Miss. Smaller loss of life, but a greater destruction of property, marked the South Sea Island visitation.

Twenty-five tornadoes a year, three of them, at least, of tremendous violence, is about the average in America. In 1884 there were over sixty. During the closing decade of the last century nearly 3700 lives were lost and property worth over $25,000,000 was reduced to kindling wood.

These terrific outbursts of nature's fury grow from a zephyr that can scarcely stir a lily upon its stem. With all his inventive ingenuity and his triumph over the elements, man is not yet able to switch a tornado from its deadly course.

After the fearful destruction of life and property at Snyder, O. T., last year, the inhabitants "throughout that country roundabout" set to work providing "cyclone cellars" against the coming of a similar storm in the future.

It was stated that at least 5000 of these "cyclone cellars" were constructed. Some towns passed ordinances requiring them.

As is very often the case, a wrong name was given the atmospheric agency that aroused such fear. It was a tornado, not a cyclone, that destroyed Snyder. Almost all such damage, in whatever part of the world, is done by tornadoes and hurricanes, not by cyclones.

The name tornado has been appropriated from the Spanish. It means "twisted," which characterizes the shape and movement of the funnel-like cloud.

A tornado is the most violent wind disturbance known. In certain parts of the Pacific and Indian Oceans—in the neighborhood of the Philippines, for insance—such a storm is called a typhoon.

Cyclones, to correctly apply the term, are the general, ordinary storms—revolving discs of air — almost continually moving in the upperper circles of the atmosphere. They sweep in great circles, hence the term; but these circles may have vortices some hundreds of miles in diameter.

Hurricanes in America plow up the Atlantic coast, as a rule, originating in the Caribbean Sea, and leaving the continent about the Gulf of St. Lawrence. They blow straight ahead and their greatest damage is usually to shipping and water-front property.

The diameter of a cyclone may be a thousand miles, while a hurricane may sweep a path several hundred miles wide, and roar along for days.

The tornado, on the other hand, is of short duration and of local violence.

Usually, it is only a mile or so in breadth at the top, and, probably, only a few hundred yards wide at the bottom of its funnel.

OFFSPRING OF THE CYCLONE.

The tornado is the offspring of the cyclone. Sometimes a cyclone, in its great sweeping movement over a country, will drop half a dozen or more of these unruly children to earth, where they soon expend their passionate energy.

Professor Willis L. Moore, Chief of the United States Weather Bureau, states that four conditions are usually precedent to the formation of a tornado.

These are: An area of low pressure, or a cyclone, with its centre to the north or northwest; a temperature of about 70 degrees in the morning; great humidity, and the season generally between the middle of March and the middle of June.

A tornado is distinguished by its funnel-shaped cloud that droops to the earth, swaying and swinging as it advances. The rotary motion of the wind is always in a direction contrary to the hands of a clock.

On the inner side of this whirling funnel, the wind revolves much faster than on the outer edge, sometimes reaching 200 miles an hour.

A strong upward draught, or suction, marks this centre, and this is what causes so many of the peculiar phenomena of such storms.

It can exert against the side of a house a pressure of over 200 pounds to the square foot. Often this suction, operating upon houses that have the windows and doors closed, will, through the vacuum brought to bear, cause the upper stories to explode from the pressure of air within.

Frequently, one reads of a person, animal or object being picked up and carried some distance by the power of this suction, which grasps anything in its path like a giant hand.

Houses have been picked up bodily and whirled away, leaving the amazed and terrified inmates sitting in on the lower floors, which still adhere to their foundations.

The recent tornado at Meridan picked up and carried some distance the baby of James Stewart. The child was let down again so gently that it was not injured, and went to sleep on the ground where it dropped.

HAS TERRIFIC FORCE.

At the top the outer edge revolves at the rate of seven ar eight miles an hour, while the bottom whirls at the rate of nearly 200. This force has been strong enough at times to drive straws and cards deep into the bark of trees.

As a rule, tornadoes move from the southwest toward the northwest. Their patway along the ground being narrow, it is possible frequently, to run outside the limits of destructive force. One should always run toward the north or the northwest of its apparent track.

Among the localities visited in the United States last year by tornadoes were; Herrick, S. D., which town was literally blown away, with three persons killed and a number injured; Fort Worth, Tex., where one man was killed; Winnipeg, Manitoba, with a death list of four; Grand Forks, N. D., two killed; Overbrook, Kan.; Randolph County, Virginia, nine killed; Appleton, Minn., one killed, several injured; Salisbury, N. C., two churches and wing of a college building blown down.

The American areas most frequently visited are the Ohio and Mississppi Valleys, the plains of the Southwest and Northwest and the Gulf States. Few States east of the Rocky Mountains, however, have escaped these unwelcomed visitations.

SAVED BY HIS DEFORMITY.

To the fact that he is a cripple, Charles Harris probably owes his life. He was in the depot building, which was wrecked. Being unable to escape when other inmates ran out, Harris sat upon the floor, and, although the upper part of the structure was whisked away, he escaped without a scratch.

Tornadoes usually occur late in the afternoon or in the early night hours. They are formed by cold, dry currents of air, coming down from the northwest, meeting the warm, moist currents traveling northward from the tropico.

It must be remembered that, at the surface of the earth, the atmosphere is able to absorb only a small proportion of the heat waves from the sun. These waves warm the earth's surface, but do not penetrate very far, as land is a poor conductor.

Being a good radiator, however, it throws off the heat and warms the atmospheric belt about it, the heat slowly rising through the overhead strata.

In the spring, the daily increasing power of the sun carries on this process more quickly than at other seasons; hence the prevalence of tornadoes during spring months.

This warm, moist air develops a much greater degree of heat than is found in the cold strata above, which still retain the frostiness of winter, which they bring down from the north. This result in the unstable condition of heavier, colder air resting upon beds of warmer, lighter atmosphere.

If this top-heavy combination were not disturbed, it would probably cause little trouble; but the southerly winds come along and jostle the equilibrium.

As a result, the warm, upward pushing air breaks through, in places, the lower guard of the cold belt above, permitting columns of the heated atmosphere to rush threugh the crevices and grapple in deadly embrace with the resisting currents they encounter.

It is while fighting this giant battle that great sections of the dry, extremely cold air and of humid and very warm air breaks away from the body of the vast upper cyclone that gave them birth, and fall to earth in the shape of tremendous, sweeping whirlwinds that are called tornadoes.

While one of these is roaring its way, which, happily, happily, is usually brief, the vacuum tube in the centre of the tornado is constantly sending up warm air.

Reaching the colder strata above, this is condensed in the form of rain. It is this condensation of vapor that forms the cloud which marks the course of the storm.

Naturally, the part of the funnel which is nearest the earth is filled with dirt, leaves and debris of different kinds, so that it presents a dark appearance when approaching.

When a gun is fired, there is a sudden formation and expansion of gas. Directly the reverse of this takes place in the formation of a tornado.

Moving forward at a rate of from twenty to sixty miles an hour, the different parts of the funnel spin with different velocities.

THE APPALLING DAMAGE DONE BY TORNADOES

Adams County, Mississippi, May 7, 1840—100 killed; property loss, $1,000,000.

Adams County, Mississippi, June 16, 1842—500 killed; property loss, $3,000,000.

Erie, Pa., July 26, 1875—134 killed; property loss, $500,000.

Barry and Stone counties, Missouri, April 18, 1880—100 killed 600 injured; property loss, $1,000,000.

Grinnell, Iowa, June 17, 1882—100 killed, 300 injured; property loss, $250,000.

Illinois, Kentucky Mississippi, Georgia, Tennessee, Virginia, North and South Carolina, February 9, 1884—800 killed, 2500 injured; 10,000 buildings destroyed. Unparalleled series of tornadoes, there being over sixty of these scattered over the territory named after 10 o'clock on that day.

Louisville, Kentucky, March 27, 1890—76 persons killed, 200 injured; 900 buildings destroyed. The storm cut a path 1000 feet wide through the city, destroyiog property to the value of $2,500,000.

Savannah, Georgia; Charleston, S. C., and Southern coast, August 8, 1893—1000 killed; great destruction of property.

Gulf coast of Louisiana, October 2, 1893—2000 persons killed; loss of property, $5,000,000.

Lake Michigan, May 16, 1894—250 lives lost and twenty vessels destroyed off the water front of Chicago.

St. Louis, Missouri, May 27, 1896—100 lives lost; property loss, $10,000,000.

Northern Missouri, April 27, 1899—42 killed, 100 injured.

New Richmond, Wisconsin, June 12, 1899—250 killed.

Laredo, Texas, April 29, 1905—30 killed.

Marquette, Kansas, May 8, 1905—26 killed.

Snyder, Oklahoma, May 9, 1905—100 killed. Town nearly swept away.

Meridian, Mississippi, March 2, 1906—24 killed, 44 injured, property loss, $1,25,000.

An American Girl Who Is Directing a Successful Art School in Paris.

Miss Catharine Critcher.

Miss Critcher's Last Salon Picture

A Class and its Model in Miss Critcher's Studio.

In the home of art—upon its very hearthstone, so to speak, the Latin Quarter of Paris—a bright American girl has organized, and is successfully conducting a school for the instruction of art pupils.

Remembering that for generations Paris has been considered the great university in which ambitious young painters and sculptors must matriculate and graduate; that no art education was considered complete without the finishing touches of the masters there, the daring move is all the more remarkable.

Tradition retires, amazed and discomfited; the French masters gasp at the spectacle of an American, and a girl at that, presuming to conduct an art school in the sacred precincts of the Latin Quarter.

But many of the French schools have not maintained their one-time standard of excellence, and therein lay the opportunity of Miss Catharine Critcher. More than that, she has turned attention from an almost exclusive study of the nude, and has given drapery work a vogue such as has not been known in recent years.

A brown-eyed, soft-voiced Virginia girl is Miss Critcher.

Loving art for art's sake, and determining to give her entire life to its enthusiastic pursuit, she was one of those who thought a complete education could be had only in the Latin Quarter of Paris.

Three years ago she joined the army of art students who hastened from all parts of the world to sit at the feet of Gamallels of brush and chisel in the French capital.

It was only a few months before she learned that too much of her particular world had followed the beaten tracks too long.

It was a shock when she found so much of the work done in the French schools to be of a very poor quality. Many other Americans have learned the same lesson of recent years.

Such production as is often seen there could not exist in an American school because of the entrance examinations—entrance in Paris is regulated only by the question of fee.

FOUND INFERIOR WORK.

Here, in the far-famed schools of Paris, toward which she had worked so long, the advantages of which had been so eagerly anticipated, Miss Critcher found work inferior to that she had left at home.

Of course, study there has many aids impossible to secure on this side the water—the great galleries, the unfathomable, subtle beauty of "gri de Paris"—while the charm and freedom of the Bohemian atmosphere appeal to those even who do not view it through du Maurier's sympathetic eyes.

The glamour of a great name can and does draw hundreds of students to the Latin Quarter, probably with the hope that a little of the greatness may be reflected; but a great name alone cannot instruct one in art.

Association with a number of students doing good work does not only the reverse of inspiring, but is fatal in time to best effort.

Of course, every class has its geniuses, but they are lost in a crowd of men and women plodding laboriously along without real achievement, buoyed by the delusion that some day they will be numbered among the immortals.

To those who have never seen it, the picture is almost unimaginable, almost as incomprehensible as the fact of their living at all.

Many of these characters have been about "the Quarter," drifting from one school to another, for decades — according to the oldest inhabitant.

Occasionally they disappear, only to loom up in a few months, a little shabbier than at the period of their eclipse.

LIVE ON SCANT INCOMES.

As no one has ever known them to sell a picture, it is taken for granted that they live on some infinitesimal income, the inheritance of which, perhaps unluckily, took them to Paris.

There they stay, growing a little less interesting daily, to put it mildly, and deserving less pity, perhaps, because of their disinclination to correct the mistake.

It is not that they lack all knowledge of it, for the masters, in criticising, either ignore their work, or rate it according to its deserts.

This phrase, together with the predominance of nude models, gave Miss Critcher her incentive.

The nude figure is, of course, the only method for a beginner in lifework; but when portrait painting or illustrating is to be the ultimate end, a study of drapery is essential.

Eighteen months ago there was not a drapery class in one of the big schools in the Latin Quarter.

After a year spent in these—a year rich in experience, for, after all, Parisian study cannot be stripped of all its excellence and charm...this Virginia girl determined to study drapery according to her own methods.

Securing her own model, Miss Critcher took her work to Mr. Simon for criticism.

This method was a distinct advance, but it proved a great drain on the pocketbook; and, too, was without that competition in effort that spurs one to best work.

A partner for the enterprise happened along just in the nick of time, and then the success of these two girls with draped figures began to be talked about.

Others wished to join them, and the class soon became six in number, with Richard Miller as visiting critic.

This took place during the winter of 1904-05. When Miss Critcher returned to Paris from a visit to her home in Virginia last November, she found at least twenty applicants waiting to join her class.

"But that was not what I had planned," said the young "directrice" in her pretty Southern accent. "It would have been playing at cross purposes with my intentions.

"I decided, however, to take a larger studio, and to admit a dozen of the best, no more.

"There are two classes now — a morning class, with Mr. Miller, and an afternoon, with Monsieur Hoffbauer; it is optional to belong to one or both.

"And, now, what do you think? With the usual entrance fee from each student, I find my own expenses obliterated—not altogether the most objectionable feature of the venture.

"There is something else that pleases me more; since the opening of my class, draped figures have become a vogue. Castaluclo has one every afternoon, and some of the other schools are trying it at one session a week.

"Am I pleased with my success? Of course. What American girl isn't? Yet mine was rather greatness thrust upon me.