

yet be said to be the national musical instruments of the island, for they are still used in the dances of the Gibaros. The guicharo, a long calabash shell indented and played upon with a stick, was used at balls in society as an accompaniment to the piano and other modern instruments, and was even adopted by the Spanish military bands when they played the country dances. The writer was once welcomed to the island by a serenade from a party of natives with their crude musical instruments.

THE METEOROLOGICAL OBSERVATORY OF SAINT IGNATIUS COLLEGE, CLEVELAND, OHIO.

By JAMES KENEALY, Local Forecast Official, dated Sept. 27, 1901.

In furtherance of the expressed wish of the Chief of the Weather Bureau that due credit be given, as far as practicable, to the various cooperating observers scattered throughout the country, who, in their earnest desire for the advancement of science are unselfishly contributing much of their valuable time, day after day, in a labor of love that inures to the general welfare of the public, I take pleasure in submitting, for publication in THE REVIEW, some interesting facts in the history of an educational institution of this city which, for several years past, has furnished valuable reports to the Bureau.

Saint Ignatius College, Cleveland, Ohio, is an outgrowth of a school which was opened by the Society of Jesus for the reception of day pupils, in September, 1886. It was incorporated under the laws of Ohio on December 29, 1890, with power to confer the ordinary degrees. Five years later the establishment of an observatory was decided upon, as a means of encouraging pupils to pursue investigations in natural science. Between the two kinds of observatories, astronomical and meteorological, the fathers chose the latter, in deference to the wishes of the Reverend Father Odenbach, who felt a strong desire to extend the chain of meteorological observatories then under the direction of the order in the various countries of the globe, and which numbered about twenty, so as to include one in the United States. Thus was established, in 1895, the first meteorological observatory of the Jesuits in this country, and at the present time it is the only one. Among those in other countries, the ones which, perhaps, have attracted the most attention are the Rome Observatory, by reason of the work of the renowned astronomer, Secchi, its director for many years; the Havana Observatory, of which Father Vives was in charge; and the Manila Observatory in the Philippines. Father Frederick L. Odenbach was appointed director of the Cleveland Observatory, and still retains the position. In his appointment the college made no mistake, for the director, besides being an enthusiastic meteorologist and an accomplished physicist, has shown himself to be an indefatigable worker. From slender means he has succeeded in equipping the observatory with a very complete line of meteorological instruments, including not only those usually found at first-class stations of our Bureau, but also the spectroscope, thermopile, nephoscope, electroscope, a Secchi meteorograph, and a lightning recorder, with a Lodge coherer. "Home made" parts of self-registering attachments to several of the instruments bear evidence of natural ingenuity and mechanical skill on the part of the director or his assistants.

The Secchi meteorograph is an object of great interest to visitors. It stands 9 feet high on its base, and is itself 6 feet high and 3 deep, and weighs 600 pounds. The pendulum alone weighs 50 pounds, and 81 pounds of mercury are required to fill and float the barometer. It gives a continuous record of the pressure, the temperature, the velocity, and direction of the wind, and the beginning of rain. Father

Secchi, who was one of the greatest among the pioneers in meteorology, began his work on this instrument in 1852, and completed it in 1867. The apparatus was then placed on exhibition in Paris, and won for its maker the decoration of the Legion of Honor.¹

During the few years of its existence the observatory has done a great amount of work along special lines, such as cloud photography and cloud study, observations of the conditions of the air at higher altitudes by means of scientific kite flying, and observations of ground temperature at certain depths. Besides his lectures on the natural sciences as a part of the college course, the director found time last winter to give a series of six lectures of two hours each, on modern meteorology and the work of the United States Weather Bureau, to a large class of the teachers of our public schools, by whom they were appreciated as highly interesting and instructive. By such unselfish labors for the spread of education Father Odenbach is winning deserved popularity among all classes of our citizens.

Daily observations of the temperature of the ground since January, 1897, have been compiled, and the monthly means appear in the catalogue of the college for 1900-1901.

Father Odenbach was born at Rochester, N. Y., in 1857. He attended a parish school for five years, and received two years' instruction at the Rochester Collegiate Institute, preparatory to a course at the Rochester University. He left the University to enter Canisius College, Buffalo, N. Y., from which he was graduated in 1881. At this time he joined the Jesuits and went to Europe, where he continued his studies in mental philosophy, natural science, and mathematics. After his return he taught mathematics at Canisius College, Buffalo, N. Y., for three years. He then went to England for four years' further study, and on his return, in 1893, was appointed professor of physics and chemistry in Saint Ignatius College, Cleveland, Ohio, a position he still holds, together with subsequent assignments as curator of the museum and director of the meteorological observatory.

THE TORNADO IN HUDSON COUNTY, N. J., ON AUGUST 24, 1901.

By JOHN H. EADIE, Voluntary Observer, Bayonne, N. J.

The cities of Bayonne, Jersey City, and Hoboken occupy the greater part of Hudson County, adjoining one another, in the order named from southwest to northeast. New York Bay and the southern end of Hudson River bound them on the east and Newark Bay bounds Bayonne and the southern end of Jersey City on the west. Through this section, what appears to have been a true tornado passed on the afternoon of August 24. The weather map for that day showed a receding high off the middle Atlantic coast, another high of quite large extent advancing over the Lake region, and a receding low over the mouth of the St. Lawrence River with an extension down the coast between the two highs. Quite heavy rain had been falling from early morning, with a moderate wind from southeast. Just before 4 p. m. the clouds became heavy and dark along the horizon from west to north and advanced with every indication of a squall from that quarter. A roaring of wind was heard, but not louder than that which often precedes a thunderstorm. The writer was to the southeast of the coming storm, and while no funnel was seen against the dark background, a tornadic wind advanced from Newark Bay and struck Bayonne opposite the foot of Thirty-sixth street, about 500 yards from the writer's home, and traveled in a northeasterly direction about 12 miles, accompanied by

¹This instrument was purchased by Gen. A. J. Myer and exhibited for many years at the Signal Office in Washington. After having been stored away in the Smithsonian Institution it was transferred to the college in Cleveland.—Ed.

heavy rain. It was subsequently learned that the tornado first made its appearance at a small settlement known as Bloomfield on the west side of Staten Island about 2 miles from the lower end of Newark Bay, where it blew down and unroofed some barns and uprooted several large trees. It then apparently traveled up Newark Bay about 2½ miles and entered Bayonne as above stated. It did not do any extensive damage in Bayonne, but in the southern or Greenville section of Jersey City it destroyed some small frame buildings, severely injured a man and woman who occupied one of them, and totally destroyed a small frame church. The greatest damage done was in a thickly settled residential portion of Jersey City, where many dwellings lost roofs and chimneys. A large church had the greater part of its roof and side wall blown out; another lost its steeple; and the rear wall of a theater was blown out.

The entire path of the storm was narrow, apparently no where exceeding 500 feet in width. It skipped over many places lying in its course, but wherever it descended its action was fierce. The best evidence of its tornadic character was shown at Greenville, above mentioned, where it uprooted and broke off a number of trees within a space about 500 feet in diameter. These were located near the wrecked church referred to, in an apple orchard, and in the cemetery near by. The writer found these trees lying with their tops pointing toward the northeast, north, northwest, southwest and southeast, all in fairly regular order, the whirl of the wind apparently having been in a direction contrary to the motion of the hands of a watch laid on its back. Some of the larger trees were about two feet in diameter.

It has been estimated that the total loss caused by this visitation was in the neighborhood of \$150,000.

While small storms of a similar character have occurred in recent years within a few miles of New York City, such as the Cherry Hill disaster in July, 1895, and the wrecking of several buildings in Elizabeth in August, 1899, no storm of equal destructive force and at the same time such narrow limits has ever been known to occur in Hudson County, or at any other place so near New York City, and for that reason it seems to deserve special mention.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Popular Science Monthly. New York. Vol. 59.

McADIE, Alexander. Fog Studies on Mount Tamalpais. Pp. 535-541.

Ramsay, W. The Inert Constituents of the Atmosphere. Pp. 535-541.

Science. New York. Vol. 14.

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Mill, Hugh Robert. Meteorology on the British Antarctic Expedition.

Curtis, R. H. On Thunderstorms. P. 128-130.

Fry, Isabel. Iridescent Clouds. P. 140.

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— The National Antarctic Expedition. Pp. 275-279.

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— The Italian Arctic Expedition, 1899-1900. Pp. 282-284.

— The National Antarctic Expedition. Pp. 275-279.

Scottish Geographical Magazine. Edinburgh. Vol. 17.

Bruce, William S. The German South Polar Expedition. Pp. 461-467.

Bidlingmaier, Fr. The Work and Equipment for Earth Magnetism and Meteorology of the German South Polar Expedition, and Suggestions for International Cooperation during the time of the South Polar Research, 1901-1903. Pp. 467-470.

— Antarctic Climate. 473-480.

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Mill, Hugh Robert. Climate and the Effects of Climate. Pp. 169-184.

Marriott, William. Special Characteristics of the Weather of March, 1901.

Strachan, Richard. Vapour-Tension in Relation to Wind. Pp. 197-198.

— Lightning Research Committee. P. 184.

— Cloud Observations at Toronto. Pp. 195-196.

— Weather Forecasts by Wireless Telegraphy. P. 198.

— A Feeding Storm. P. 193.

— Crowing of Pheasants during Thunderstorms. P. 239.

— Red Rain, March 10-11, 1901. P. 239.

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— La couleur et la polarisation de la lumière céleste. Pp. 338-343.

L., V. D. La distribution de la température au fond des mers. Pp. 343-346.

— L'activité solaire de 1833 à 1900. Pp. 353-354.

— Le climat Saharien. P. 356.

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Besson, L. Colonnes lumineuses des 26, 27, et 28 juin 1901. P. 235.

Ritter, Charles. Le nuage et son rôle dans la formation de la pluie. Pp. 203-234.

Maillet, E. Résumé des observations centralisées par le service hydrométrique du bassin de la Seine en 1899.

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— Pluie de Fourmis. Pp. 230-231.

Marey, E. J. Les mouvements de l'air étudiés par la chronophotographie. Pp. 232-234.

Stassano, Henri. Les aurores polaires. Pp. 235-236.

Laffargue, J. La télégraphie sans fil. Pp. 258-262.

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Gaea. Leipzig. 37 Jahrg.

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— Ein merkwürdiger Regen. P. 634.