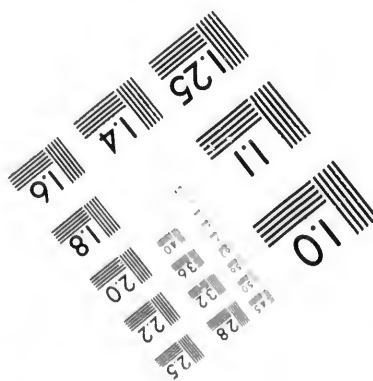
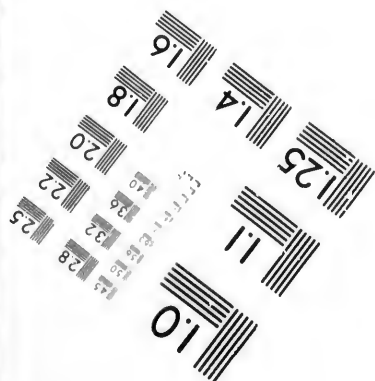
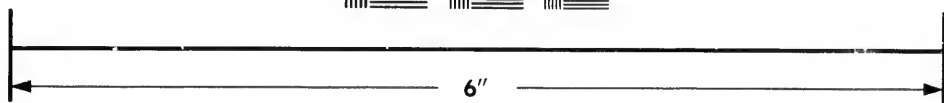
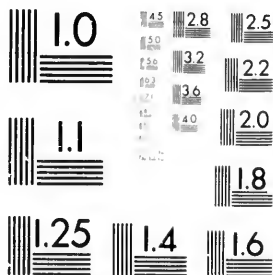


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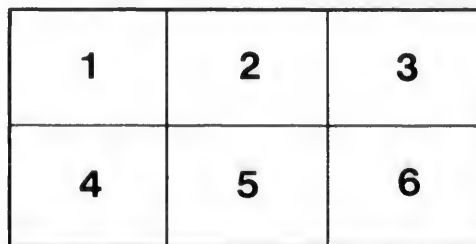
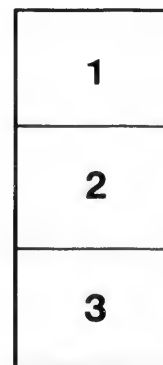
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LIST OF RECORDED
EARTHQUAKES

In New Brunswick.

COMPILED FROM PUBLISHED WORKS AND
FROM PRIVATE INFORMATION.

BY SAMUEL W. KAIN.

Reprinted from Bulletin XVI of the Natural History Society of
New Brunswick.

ST. JOHN, N. B.:
BARNES & Co., PRINTERS, 84 PRINCE WM. STREET,
1898.

ARTICLE II.

LIST OF RECORDED EARTHQUAKES IN NEW
BRUNSWICK.

COMPILED FROM PUBLISHED WORKS AND FROM PRIVATE INFORMATION.

BY SAMUEL W. KAIN.

Read March 1st, 1898.

In recent times much attention has been given to the study of earthquakes. In the historic period a number of shocks have been felt in this Province. Information in regard to them, however, is scattered and not easily accessible. Some of the shocks have been noted only in the newspapers, and a few of the more recent, in Grand Manan, have been drawn to my attention by one of our corresponding members resident there.

The following list has been compiled for the convenience of students, both in New Brunswick and abroad, and will be found complete for all shocks recorded. The time given (unless otherwise stated) is local time. To reduce St. John local time to 75th meridian time, deduct 35 mins. 44 sec.

1663. February 5; 5.30 p. m., 8 p. m.

This earthquake was of considerable violence, and was felt throughout the St. Lawrence Valley, Acadia and New England. (*Can. Nat.*, Oct., 1860).

1755. November.

Three or four shocks are recorded as having been felt in New England and Nova Scotia (then including New Brunswick). Sir William Dawson states (*Can. Nat.*, October, 1860) that two of these shocks were violent.

1764. September 30; about noon.

In the *Halifax Gazette* (Nova Scotia), December 13, 1764, occurs the following news item: "We hear from St. John's, in this Province, that on the 30th of September last, about 12 o'clock at noon, that a very severe shock of an earthquake was felt there."

1817. May 22; 3.31 a. m.

Felt in all parts of New Brunswick. The following account is from the *Courier*: "A heavy shock of earthquake was felt in St. John on the 22nd,

31 minutes past three o'clock, a. m. It was preceded by a noise as if a gale of wind sprang up, after which the earth began to shake violently, rumbling as if heavy carriages were passing. The trembling continued 15 seconds. The air was clear, with not a breath of wind. A minute after the shock moanings were heard from the southward. The earthquake was felt at Fredericton, fully as violent as at this place. At St. Andrews the shock was severely felt; the alarm was so great as to occasion the soldiers to leave their barracks. The shock at Fredericton occurred at 3.25 p. m.; tremulous motion lasted 25 seconds; profound calm; atmosphere heavy."

The same journal has also an account of the shock as felt at Grand Manan, which is of interest: "The earthquake of 22nd May was felt at Grand Manan; occurred just before daybreak, commencing with a loud sound, at the same time a violent shaking of houses. The shaking did not continue, but the sound lasted from 30 to 45 seconds. All agree in describing the motion as violent and the sound very loud. Weather fine and serene; light wind from northward; previous day uncommonly hot."

Peter Fisher, in his *History of New Brunswick* (1825), refers to this shock in the following paragraph: "New Brunswick appears to be but little liable to the great convulsions of nature, such as earthquakes, hurricanes, tornadoes, etc. There has been but one shock of an earthquake experienced by the present inhabitants since they settled in this country (i. e., 1783-1825). This shock happened on the 22nd May, 1817, at 25 minutes past 3 o'clock in the morning. The duration of the shock was about 45 seconds. It was attended with the usual rumbling noise, without thunder, the weather being serene and pleasant. The appearances, however, usually indicating earthquakes, such as fiery meteors, the uncommon brilliancy of the aurora borealis, etc., had been frequent the winter preceding."

In the journal* of Azor Hoyt, 1813-1855 (of Lower Norton, Kings Co., N. B.), the following entry occurs: "May 22nd (1817) a shock of an earthquake."

This shock was felt all through the Maritime Provinces.

1824. July 9.

Severe shock felt all over the Province. —(*Can. Nat.*, October, 1860).

1855. February 8; 6.30 a. m.

Felt all over the Province; also in Nova Scotia and in parts of the State of Maine. Moderate.

Dr. P. R. Inches has placed in my hands the following note made by him at the time:

"SAINT JOHN, February 8th, 1855.

This morning at half past six o'clock several shocks of an earthquake were felt here. I was lying in bed at the time, not quite awake, when I was startled by hearing a roaring and rumbling noise as of a chimney on fire, but much louder, followed by a violent shaking of the house and bed. I at once started out of bed to see what was the matter, but could find no cause for the noise. I could not imagine what was causing it unless it was an earthquake. I got into bed and shortly after, I think in about five or

* Manuscript: in possession of Rev. W. O. Raymond, St. John.

six minutes, felt another shock, but so very slight as to be just perceptible and no more. Again a few seconds after this second shock I thought I felt another, but I was not positive. The first shock lasted forty or fifty seconds, the second about the same time. It has, I believe, been felt at Chatham, Fredericton, Dorchester, and in the State of Maine. It appears to have been felt at Dorchester more than anywhere else. Some windows in the house of the Hon. E. B. Chandler of that place were broken."

Speaking of this shock in *Acadian Geology*, pp. 39-40, Sir Wm. Dawson says: "Its point of greatest intensity appears to have been at the bend of the Petitcodine (Moncton). At this place there were several shocks, one of them sufficiently severe to damage a brick building."

In the Journal of Azor Hoyt, the following entry occurs: "February 8th, (1855). Three shocks of an earthquake — felt all through the Province." This is the last entry in the Journal.

1860. October 17; 6.25 a. m.

Felt over a large area of Eastern Canada and the New England States. Also felt in this Province. Moderate in New Brunswick, but severe in Quebec and Ontario.

The *Morning News* of October 19th, 1860, says: "A vibration of the earth from twenty to thirty seconds in duration occurred about twenty-five minutes past six o'clock on Wednesday morning along the western side of the harbour, causing the houses to shake quite perceptibly, and in several cases awakening people from their slumbers. We do not know what distance it extended or whether it was perceived in St. John or not; but parties residing in the vicinity of Negrotown Point felt it very distinctly, as did persons living near the Asylum."

1869. October 22; 5.48 a. m.

This earthquake was of considerable violence, and was felt all through the Maritime Provinces, St. Lawrence Valley and the New England States. The reports published in our city papers describe it as the most violent shock ever felt here. It was preceded by a rumbling rushing noise like the noise of distant thunder, and then came the vibrations, or series of them, which seemed to pass away in the distance as though a wave like motion had been imparted to the crust of the earth. These vibrations appeared to be travelling nearly east and west. Houses were shaken, dishes rattled, and bells rung, and in some cases flower pots, etc., were rolled over. The shock lasted about fifteen seconds. The papers of that date (October 25th, 1869) state that the waters of lakes and streams were discoloured by the shock, and it is noticed in particular that the water of the stream at Penobsquis, which supplied the paper mill at that place, turned chalky and had not regained its clearness on the following day. It is worthy of remark that at Fredericton, in Mr. Babbit's shop, the clocks facing north-west were stopped, while those at right angles to that direction were not affected.

W. Watson Allen has given me the following note about this shock: "At Derby (Miramichi), at the Mill Pond, known as Wilson's Mills, a spring on

the west bank of the pond, before the earthquake, boiled out of the ground, rising to a height of about a foot. After the earthquake, the fountain part of the spring disappeared, although the spring itself is still there, but diminished. Mr. William Wilson, who had lived there many years, always claimed that the pond had increased in volume of water to a large extent. "At the forks (the confluence of Cain's River and S. W. Miramichi), Mr. Jacob Layton, who had resided there continuously for a number of years, states that in the bed of the main Miramichi River, near the shore where the water was quite shallow, and on a spot of ground that he knew very well, after the earthquake there appeared a spring of boiling water, sufficient to make a commotion upon the surface. There never had been any indications of it before the earthquake."

1870. March 17; 6 to 8 a. m.

Felt at St. John and Fredericton. Light. It was at this time that a landslide occurred at Sand Point, carrying the end of the Point out into the deeper water of the harbour. Sand Point is a gravel deposit formed by the meeting of the harbour tides and the river, and is underlaid by clay. This clay had probably been eroded by the action of water, and a heavy storm the day before had hastened a condition of instability which, even without a slight earth movement, would soon have caused the landslide.

1870. October 20; 11.40 a. m.

Felt all over the Province. In the lower part of the St. Lawrence Valley it was much more violent than in New Brunswick.

Dr. Jack, of the Provincial University, at Fredericton, in a despatch to the *St. John Daily Telegraph* (October 21st, 1870), thus describes it: "It was at seventeen minutes before noon that the first shock was felt here. This lasted perhaps two seconds, and was shortly followed by another of about the same severity, which may have been the return stroke, as the interval between was not over half a minute. The motion was vibratory, and seemed to be from south to north. It was not as strong as the earthquake of last year. There was violent wind all of Tuesday afternoon and night, and this afternoon we have a heavy rain and lowering darkness." The time at St. John was accurately noted to be 11.40; at Fredericton it was 11.43.

1882. December 31; 9.56 p. m.

St. John, Rothesay, Sussex and Fredericton. Light. Two shocks felt. The following is from the *St. John Daily Sun* (January 2nd, 1883): "At four minutes to 10 on Sunday night a slight shock of earthquake was felt. In one residence on Charlotte street a vase was thrown from its stand to the floor and broken; in another house, in an opposite part of the city, all the ornaments on a Christmas tree were set swinging vigorously. The shock was also distinctly felt in Indian town and on the other side of the harbour. It was also felt at Sussex, Fredericton, and very markedly at Rothesay."

1884. January 26.

At Rothesay. Three light shocks. Reported in *Daily Telegraph* of January 29th.

1885. June; 10 a. m.

Rothesay, Seal Cove and Southern Head, Grand Manan. Light at Rothesay, but severe at Southern Head, where several tons of rock fell from the cliffs near the lighthouse.

1896. March 22; 7.56 p. m.

This shock was felt in Charlotte and York Counties, New Brunswick, and in Washington County, Maine. The area disturbed has a diameter of about 100 miles, and lies adjacent to the shores of the Bay of Fundy and the Gulf of Maine.

By correspondence with observers at different points, I have been able to secure some notes on this disturbance.

EASTPORT, Maine.—The shock took place here March 22nd, at 7.56 (75th meridian time), and lasted four or five seconds. This office is located in the new government building, built of granite, and on a solid ledge. Still, the tremor was distinctly felt throughout the building, and more so by those living in wooden houses. The shock had no perceptible effect on our barograph. It had been rising steadily since noon, and I failed to see the least deviation in the trace.

D. C. MURPHY,

U. S. Meteorological Observer.

BEAVER HARBOR, N. B.—Shock slightly felt here on 22nd March at 8.45 p. m. Jar enough in some buildings to make glass rattle.

FLAGG'S COVE, Grand Manan, N. B.—A slight earthquake shock was felt here on Sunday, March 22nd. The noise was very distinct, but only lasted a few moments. It was felt all over the island at the same time as at this station.

CLARA C. SEELY,

Dominion Meteorological Observer.

ST. ANDREWS, N. B.—The shock was markedly felt at St. Andrews. A well known gentleman resident there wrote me as follows: "The noise at first was very sharp and was succeeded by a gradually lessening sound, and was all over in three seconds. It occurred at 8.45 p. m."

In addition to the above places the shock was felt in all the West Isles, on the mainland northward to McAdam, some distance along the line between McAdam and Woodstock, and at St. Stephen and Pennfield.

The shock was not felt at St. John, Fredericton, or Yarmouth, N. S.

1896. May 15th; 11.00 p. m.

A light shock was felt on this date at Fredericton, along the Nashwaak Valley, at Andover, and up the Tobique Valley as far as Three Brooks. A gentleman at Fredericton, in a letter to me, described it as "one momentary concussion." Dr. Welling, writing from Andover, says: "Two

shocks from an earthquake were felt here on the night of 15th of May about 11 o'clock. I was in bed at the time and felt the bed shake and tremble. One gentleman was about retiring when he heard what he thought were horses running around the house, but when he reached the door the noise was repeated and he saw at once that it was the shock of an earthquake. It was heard at Three Brooks on the Tobique River some twenty miles distant about the same hour."

1897. January 26; in the morning.

Felt at Campobello and Deer Island. Light.

1897. January 28; 9 p. m.

A sharp shock felt at Southern Head, Grand Manan. Duration about two seconds. Mr. W. B. McLaughlan, the light-keeper, in writing, says: "It shook us up so violently that it set my dogs barking and the horse and cattle in the stable tried to break loose. I made a record of it in my journal."

1897. February 14; 9 p. m.

Mr. McLaughlan goes on to say: "On the evening of the 14th inst., about the same hour, we felt another sharp shock, but not so violent as that of January 28th.

"I am of the opinion that these shocks are of frequent occurrence in the Bay of Fundy, and are generally thought to be the reports of cannon. I recollect that about twelve years ago the middle of next June, at 10 o'clock a. m., we felt a violent shock at this station and at Seal Cove, but the only place on the mainland that I noticed it reported was at Rothesay, Kings Co. That shock was so violent that several tons of rock fell from the cliff near the lighthouse."

1897. September 25; 1.30 p. m.

Parts of Charlotte and York counties in this Province, and in some parts of Eastern Maine. Light. Felt distinctly at Canterbury, McAdam and St. Stephen. At St. Stephen it rattled dishes, etc., and at McAdam the earth trembled as from the passing of a heavy railway train. It lasted fifteen seconds.

Not felt at St. Andrews, Eastport, or Woodstock.

1897. October 12; 10.35 p. m.

South West Head, Grand Manan. Light. "Duration about five seconds. Wind due south, strong gale and hazy weather, about two hours to high tide. Shock from southeast with a roar like a waggon over a frozen road. It shook the buildings sufficiently to alarm my watch dog." (Letter from W. B. McLaughlan).

1898. January 11; 2 a. m.

At South West Head, Grand Manan.

"We felt a sharp shock of earthquake at this place on Tuesday, the 11th inst., at 2 a. m. It sounded like a heavy explosion, Wind northeast, light, high water, clear cold weather." (Letter from W. B. McLaughlan).

The greater frequency of earthquakes at Grand Manan than at any other place in the Province is worthy of note, and it is possible that further observations may show some connection between the so-called "gun reports" (see Bulletin XIV, pp. 40-44, 1896,) and these light earth movements.

In the discussion which followed, Dr. Geo. F. Matthew said: "This part of the Bay of Fundy is remarkable for its great depth and precipitous shores. Off Brier Island the bottom descends to a depth of 100 fathoms in a distance of three miles from the outermost ledge; it is almost equally abrupt on the Grand Manan slope; the trough between is deeper than the bottom of the Gulf of Maine outside adjoining. This is the only part of the Bay of Fundy where there have been heavy outflows of trap of Triassic age on *both* sides of the bay, and the abyss between may be complementary to these ejections of lava. The weakness of the earth's crust here in Triassic times, as shown by the volcanic eruptions of that age, may not even yet be altogether removed; but the greater tendency to earthquake movements in this district may be the dying throes of the old Triassic disturbances."

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