

Report. Another party was employed in the Lower St. Lawrence, and particularly about the Magdelene River and Gaspé Bay. Together with geological descriptions of their neighborhoods, we have accounts of their geographic and economic character. Then there are given, by Sir W. E. Logan, Reports upon the Fauna at certain parts of the Lower St. Lawrence, upon Canadian graptolites, upon limestones of the Black River and Galt, and upon dolomites in the Lower St. Lawrence and about Galt. There is a Report from Lieut. E. D. Ashe, R.N., upon the longitudes of several principal points in this country, which are now determined with exactness. And there is a business-like discussion upon the new artificial manure made from refuse fish, &c., in the Gaspé Bay. The volume contains four maps, and a number of wood cuts, illustrative of the Geological and Geographical information thus given. While this information is largely scientific and the style technical, it is interspersed with discussions of immediate popular interest. Persons who intend having a complete collection of these Reports, and those who are studying to get into their mind a connected geological view of this country, should now secure copies of this volume, which has been printed by order of the House of Assembly.—*Colonist*.

### 2. THE MARBLE AND LIMESTONE OF THE OTTAWA.

Mr. Hunt, of the Geological Survey, in a lecture on the Economic Geology of Canada, after describing the various kinds of Marbles, proceeded to speak of those found in Canada. At Arnprior, near the mouth of the Madawaska River, there was a very beautiful variety, in which bands and stripes of dark blue irregularly occurred, giving it sometimes a zebra-like appearance. A marble-worker here had polished some blocks of this stone, and Sir William Logan had pronounced the opinion that it was a rock which could be wrought with great ease, and which would form an excellent material for decorating the interior of houses. At Moosinaw Lake, Mr. Hunt had seen masses which for beauty and uniformity of color would bear comparison with the finest marble of Carrara. The famous statue of Apollo Belvidere was a dolomite, chemically identical with this beautiful white limestone of Moosinaw Lake. The limestone of Grenville, Chatham, and further up the Ottawa, when dressed, would make an abundant and beautiful material for the front of houses, superior to that used in New York and Philadelphia.—*Leader*.

### 3. THEORY OF RAIN STORMS.

At the meeting of the Hamilton Association, on Monday of last week, an able and interesting paper was read by Dr. Hurlburt on the subject of Rain Storms, more particularly with reference to that which visited our city in the early part of November. This storm was heaviest in Chicago and Milwaukee on the 1st and 2nd of November, and at Hamilton, 400 miles distant, from 7 or 8 p. m., of the 5th of November, till 9 p. m., of the 6th. The wind was east or E.N.E.; a Milwaukee paper states that, for several days previously, it had blown mainly from the east, and the wrecks on all the Upper Lakes testify to the violence and extent of the storm. Nevertheless, the storm receded eastward about 100 miles a day. On the day during which the rain was the heaviest in Chicago, it was cloudy in Hamilton, and the storm had spent itself in Chicago before it began here. The thermometer, during the six days it lasted, was at an average of 47.83 at 9 a. m., and 47.66 at 9 p. m., the highest being 52° and the lowest 45°. The barometer varied little from the average of the time of year, 19.66.

The records of many such storms, with an east wind, show that they recede eastward often at 800 miles a day. Two interesting questions are here suggested: 1st. Why do these storms occur mostly at this time of the year? and 2nd. Why do they recede eastward, while the wind is blowing from the east? In connection with these questions, it is useful to consider the function of the winds as an immediate producing cause of rain.

The most general classification of the winds would be: 1. The two great currents which flow from the equator towards the poles, and *vice versa*; and 2. local winds, such as land and sea breezes, hurricanes, whirlwinds, &c. The two great currents of air which flow north and south may be compared to the two great currents of the ocean, the tropic and arctic streams. Like them they are deflected from their general course to a north-east and south-west direction. In the temperate zones, in the interior of both continents, the winds are as a general movement, from the west, and at a rate of 400 or 500 miles a day. This is the upper return current from the equator; the under currents are variable, modified by mountains and valleys, climate, and the presence or absence of water.

The immediate producing cause of rain and snow is the meeting of currents of air differing in temperature, by which the vapour is condensed, and clouds formed. Rain falls in showers in hot climates, and even in hot weather in high latitudes; in cold atmosphere, it falls more gently, sometimes even in drizzling rain and mist, and continues

longer, often for several days. Rains in the torrid zone are occasioned by the meeting of the S. W. and N. W. trade winds; the land and sea breezes, with the warm air from the tropic plains. Nor must electricity be forgotten as an agency in storms.

These N.E. storms appear at this time of the year, and in early spring, only in these latitudes. Further north, they are earlier, and south of us, later in the autumn: between the thirtieth and fortieth parallels of latitude, causing the heavy winter rains. They occur on the borders of the snow line, by the conflict of the warm and cold winds from the S.W. and N.E. In the spring, there are similar storms such as our heavy snow storms from the east in February and March, and in fact at all seasons of the year in both hemispheres on the borders of the snow line. But in mid-winter or mid-summer, as the weather becomes settled, that is so great a distance from the snow line that the opposing currents do not meet, there are calms or winds generally in one direction, and hence little or no rain or snow.

But why do these storms recede eastwards against an east wind? Because the great body of the air in these latitudes moves from west to east, carrying with it these as it does other storms. Again, by the great heat of the sun to the south or S.W. the temperature of those regions is raised much above that of the more northern parts, the air rises rapidly, and the colder and heavier air of the north and N.E. flow in to fill up the vacuum. The movement of the air from any particular locality westward, creates a vacuum which must be supplied by the colder air from the east and N.E. Thus an easterly wind will begin west of us, and work towards us, causing rain at the points of disturbance, as it recedes eastward: the more powerful winds of the west always in the end prevail and carry the whole phenomena eastward.—*Hamilton Times*.

## VI. Papers on Practical Education.

### 1. QUESTIONS TO TEACHERS ON SCHOOL MANAGEMENT.\*

1. What is the chief difference between a gallery-lesson and a class lesson? How would you arrange four classes in the gallery of a class-room, and in what part of the room should you wish the window to be?
2. In a reading-lesson to a first class of 30 children, how would you place them before you, and how would you give a lesson from a fourth book?
3. What apparatus is necessary for a class-room in which the upper class of a good school receives instruction?
4. In your school did your Teacher criticise the lessons which you gave to your class, and did he or she give lessons to your class to serve as models for your teaching? State carefully how this was done.
5. Say exactly the method in which you give and revise a lesson in dictation.
6. What chief objects are to be attained by a good Time-table? Where was the Time-table of your class kept?
7. What practice have you had in keeping School-register? Explain clearly how you would find the average of attendance per week, per quarter and year?
8. At what hour, and on what method did you receive the daily private instruction of 1½ hour from your Teacher? Name the subject in which you received instruction during the last year.
9. Give the heads, and framework (but not the notes) of a lesson on some subject.
10. What hours do you give to recreation, and what out-of-door exercise do you take daily?
11. Describe, briefly, the locality and buildings of your school.
12. What are chief advantages in becoming an Assistant Teacher before you take sole charge of a School.

### 2. MUSIC IN SCHOOLS AN AID TO STUDY.

At the recent meeting of the Board of Education of New York city, William Cullen Bryant, of the N. Y. Evening Post, made a speech upon the subject of Music in Schools, from which we extract the following:

"In making music a branch of school education, we give new attraction to our common schools. Music is not only a study, it is an entertainment; wherever there is music, there is a crowd of listeners. We complain that our common schools are not attended as they should be. What is to be done? Shall we compel the attendance of children? Rather let us, if we can, so order things, that children shall attend voluntarily—shall be eager to crowd to the schools; and for this purpose nothing can be more effectual, it seems

\* These questions will furnish several suggestions on the management of Schools to County Boards of Public Instruction.—*Ed.*