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THE

BRITISH AMERICAN JOURNAL

OF

MEDICAL AND PHYSICAL SCIENCE.

VOL. III.] MONTREAL, OCTOBER, 1847. [No. 6

ART. XXIV.—OBSERVATIONS ON THE MORTALITY OF THE CITY OF MONTREAL, FOR THE YEAR 1846.

By A. HALL, M.D, Physician to the Montreal General Hospital, &c.

Vital statistics are of exceeding moment. Not only are we enabled, by them, to trace the progress of diseases, in their increase and decline, and in their connection with prevailing atmospheric changes, but we are enabled to point out by them what diseases are the most endemic; and if these are dependent on local causes, they naturally suggest measures whereby the evils, thus incurred, may be removed, or at least mitigated. But the beneficial results which flow from them stop not here. The ratio of mortality and expectancy at the different epochs of life being clearly developed, the rates of life assurance—a circumstance in which a provident public is immediately interested—are placed on a safe and equitable basis, because founded on positive data, and not on the speculative ideas furnished by erroneous comparison with like statistics in other cities or countries.

The first bill of mortality for this city, was published in the *British American Journal* for December, 1845. It was the result of a by-law of the City Council, providing for weekly returns of deaths in this city, with an enumeration of the diseases. In consequence of the mode adopted to obtain the names of the diseases from which the fatal issue proceeded, namely, from the friends of the deceased, the diseases are recorded most inaccurately, except in the instance of the most prominent affections; and even on these implicit reliance cannot be placed, as far as regards accuracy of specific nomenclature. They will be found valuable, however, for many purposes; and one result—not the least important—so far as the returns of one year may subserve the end, is exhibited, that the chief mortality is met with below the age of five years, or ten years. The source of inaccuracy to which allusion has been made, is now remedied, as far as possible, by causing the names of the diseases to be returned by the physicians, in cases which have been professionally attended.

TABLE 1.

M'ths.	Male.	Female.	Under 1.	1 to 3.	3 to 5.	5 to 10.	10 to 15.	15 to 25.	25 to 35.	35 to 45.	45 to 55.	55 to 75.	75-upward.	Total.
Jan.	121	150	84	88	19	15	6	9	14	11	6	16	3	271
Feb.	94	109	58	46	21	9	4	16	21	10	5	9	4	203
Mar.	92	88	55	32	18	12	4	11	14	8	15	6	5	180
April.	79	75	47	32	3	10	6	10	8	10	11	11	6	154
May.	78	85	58	37	5	9	1	6	12	16	7	9	3	163
June.	139	117	122	43	9	7	3	12	15	15	7	13	10	256
July.	96	125	102	40	6	7	3	7	12	13	10	16	5	221
Aug.	119	82	68	50	7	4	9	15	15	11	12	6	4	201
Sept.	72	63	51	25	5	2	1	6	13	11	7	10	4	135
Oct.	55	40	22	13	4	5	4	8	8	8	9	12	2	95
Nov.	55	59	36	12	9	5	3	11	14	8	6	7	3	114
Dec.	69	56	29	18	11	4	3	8	10	13	10	10	9	125
	1069	1049	732	436	117	89	47	119	156	134	105	125	58	2118

It will be observed, on referring to this table, that the month of greatest mortality was January; that the month ranking next in numbers was June; and that the monthly period characterized by the least mortality was October. The unusually high rate of mortality which the month of January presents appears to have been mainly dependant on an epidemic of measles, which, if we base our judgment on the totality of deaths recorded under that head, was a remarkably fatal one. The number of deaths from that cause, alone, in December, 1845, reached as high as 137 out of 270—the whole number recorded that month, or more than one half. The epidemic was then at its height, gradually subsiding, as denoted by a diminishing mortality until June, when it again increased, and finally fell off according to the following scale, until September, when it ceased: 97, 39, 23, 13, 12, 24, 19, 5. During the year, 237 deaths are noted, from that disease alone—25 from scarlatina, and 21 from small pox. The following table exhibits the mortality from these several diseases, until the age of five years, with the general number opposite each month.

TABLE 2.

M'ths.	Measles.				Scarlatina.				Small Pox.			
	Total.	Under 1.	1 to 3.	3 to 5.	Total.	Under 1.	1 to 3.	3 to 5.	Total.	Under 1.	1 to 3.	3 to 5.
Jan.	97	30	49	11	2	1	—	1	4	...	4	...
Feb.	39	8	17	9	1	...	...	1	.....	...	...	...
Mar.	23	8	5	6	10	2	2	4	1	1	...	...
April.	13	1	8	...	5	...	2	1	.....	...	...	...
May.	12	4	4	...	1	...	...	...	.....	...	.	...
June.	24	10	9	4	2	...	...	1	2	2	...	...
July.	19	5	10	1	2	...	...	1	1	...	1	...
Aug.	5	1	1	1	1	...	1	...	3	1	1	...
Sept.	...	...	...	...	.....	...	...	...	2	1	...	1
Oct.	1	...	1	...	.....	...	...	...	2	...	...	...
Nov.	1	...	...	1	.....	...	...	...	3	1	...	1
Dec.	3	...	1	1	1	...	...	...	3	3	...	...
	237	67	105	34	25	3	5	9	21	9	6	2

The deaths from fever, dentition, and consumption, are also remarkably high; and although those returned under the second head may be correct, there can be no question of the inaccuracy of the returns under the first and third heads. By a reference to Table III., it will appear that 377 deaths resulted from fever alone, out of which there occurred, according to the returns, as many as 265 under the age of 5 years, or nearly two-thirds! That due discrimination and care have not been observed in these cases, is too obvious to require notice. Again, with reference to the third head, or consumption, of 546 deaths returned from this cause, we have 215 under 5 years of age; and of the whole number of deaths recorded during the year from pulmonary affections, viz., 612, we find 546 from consumption alone. Not one case of pneumonia is recorded. Once or twice pleuritis is mentioned. *La Phthisie* occurs repeatedly, so repeatedly as almost to persuade us that it is the prevailing and fashionable disease of the city; while I do not consider myself far wrong in stating that tubercular consumption is not more prevalent here than in other cities, and among children especially, is by no means a common complaint. Bronchitis, however, is one of our most common pulmonic affections, and one, moreover, which not unfrequently terminates unfavourably; yet this disease is not mentioned once. The results, however, under these three heads will be observed in the following table:—

TABLE 3.

	Fever.				Dentition.		Consumption.				
	Total.	1 to 5	5 to 25	25 to45	Total.	1 to 2	Total.	1 to 5	5 to 10	10 to25	25 to35	35 to45
January.....	46	34	9	2	5	5	51	19	0	5	11	9
February.....	52	39	7	5	3	3	61	18	3	10	12	9
March.....	35	27	6	0	5	5	39	8	1	6	7	6
April.....	31	23	5	1	4	4	35	14	1	5	3	6
May	33	31	1	0	3	3	39	16	3	3	3	9
June.	49	37	6	6	8	8	61	29	0	8	9	7
July.....	24	17	3	3	12	12	69	36	0	4	9	8
August.....	31	17	8	2	20	20	65	34	0	11	5	4
September.....	21	15	1	5	13	13	31	15	0	3	4	4
October.....	15	6	2	5	7	7	27	7	1	7	2	2
November.....	19	13	2	1	5	5	35	9	0	6	10	6
December...	21	9	5	3	4	4	33	10	1	3	2	7
	377	265	55	33	89	89	546	215	10	71	77	71

A result of far greater importance, and which presents claims to attention from probably greater accuracy, will be found to obtain from the classification of the diseases in accordance with their seats. It appears from the ensuing table that a very large proportion of the inhabitants of this city die from pulmonic affections, nearly one out of every fourth death proceeding from that cause. This is scarcely to be wondered at when our frequent daily fluctuations of temperature are taken into consideration, coupled with the unsteady weather which most usually prevails during our spring and autumnal seasons, in which the germs of disease are laid, which tell at future months:—

TABLE 4.

Characters of Diseases.	Male.	Female.	Under 1.	1-3	2-5	5-10	10-15	15-25	25-35	35-45	45-55	55-75	75-upwards	Total.
Epidemic or Infectious.	328	356	222	225	84	58	15	22	24	12	13	6	3	684
Of Brain and nervous system.	99	85	83	64	1	2	3	4	5	7	5	9	1	184
Of Thoracic Viscera.	291	321	175	82	13	14	16	57	78	79	58	37	3	613
Of Abdominal Viscera.	82	57	48	30	7	4	5	5	8	8	9	12	3	139
Other diseases and diseases not specified.	269	230	204	35	12	11	8	31	41	28	20	61	48	499
	1069	1049	632	436	117	89	47	119	156	134	105	125	58	2118

The tabular statement, however, now given, tends to prove a most important point; and although it must be conceded that the results of one year are incompetent to a satisfactory demonstration, yet there can be no question that professional experience tends strongly to confirm it. It appears that the greatest mortality takes place in infants under the age of one year; in the year

1846, this mortality bore a ratio to the general mortality of 1 in every 3.35 deaths, while the mortality under the age of five years reached a proportion of 1 in 1.78; and under ten years, of 1 in every 1.66 deaths—ratios being 56 and 60 per cent. on the mortality of the year. The succeeding quinquennial period, from 10 to 15, does not appear to have been particularly distinguished, but the ratio rises through the next decimad, until it reaches its maximum again between 25 and 35, after which the succeeding decennial periods are characterised by a gradual diminution. From the ages of ten to forty-five years, the proportion of deaths estimated upon the total mortality is 1 in every 4.64, or 21.5 per cent.

The per centage of deaths, from diseases of the zymotic class, comprising those which are epidemic and infectious, or contagious; and those dependant on lesions of organs in the most important visceral regions, is a question of some moment, and, above all other proofs, is the one best calculated to develope the salubrity of a situation, those being considered the most healthy in which the deaths from diseases of the first class are least frequent. The records of one year are insufficient to point to any satisfactory conclusion on this head, yet it may not be out of place to notice the results presented to us. Of the zymotic class there were of deaths 32.29 per cent. Next in numerical order rank those from affections of the thoracic viscera, being 28.89 per cent. Next are those of the brain and nervous system, being 8.68 per cent.; and, lastly, are those of the abdominal viscera, the ratio being 6.56 per cent.

Several methods have been proposed for calculating the rate of longevity for different places. The most of them are based upon comparisons between the actual population, and periods of death; but one method, proposed by Mr. Shattuck, is to ascertain the proportion of all the deaths that occur at specified periods of life. Were we enabled to draw our conclusions from a mortality of a series of years, such data, so far as this method is concerned, would be conclusive—

Under	1	732	34.56	per cent.
1 and under	3	436	20.58	"
3 —	5	117	5.52	"
5 —	10	89	4.20	"
10 —	15	47	2.21	"
15 —	25	119	5.61	"
25 —	35	156	7.36	"
35 —	45	134	6.32	"
45 —	55	105	4.95	"
55 —	75	125	5.90	"
75 upwards		58	2.73	"

A very large mortality is found to occur in Boston and Charleston, between the ages of 20 and 50, compared to that which takes place in this city during the same period of life; and the following table, extracted from a paper published by Dr. Nott, of Mobile, in the March number of the Southern Journal of Medicine and Pharmacy, will be found to prove, that however much our population may suffer during the first five years of their existence, the mortality at subsequent periods is much diminished, the one being a necessary consequent of the other:—

" In each 100 there were in

	Charleston.	Boston.
Under 5	31.99	46.62
5 to 10	4.20	4.46
10 to 20	6.69	5.29
20 to 30	11.76	11.71
30 to 40	11.07	10.12
40 to 50	10.42	6.97
50 to 60	7.34	4.88
60 to 70	6.44	4.18
70 to 80	5.18	3.69
80 to 90	3.13	1.79
90 to 100	1.28	.29 "

Based upon the table preceding last one, is the following, calculated to exhibit the proportion of 100 persons surviving to specific ages in this city—

At birth	100
Surviving 1 year	65.44
— 3 "	44.86
— 5 "	39.34
— 10 "	35.14
— 15 "	32.93
— 25 "	27.32
— 35 "	19.96
— 45 "	13.64
— 55 "	8.69
— 75 "	2.74
75 upwards	.06

The foregoing statement is easily understood, but, as I have already remarked, no safe conclusion can be drawn from the results of one year, and it is therefore not necessary to push this enquiry farther. The table is by no means a favourable one as regards longevity; and this fact is further developed by estimating the average duration of life from the premises laid down; which is found to be 18.43 years: lower than that of New York, which is found to fluctuate beteewn 19.69 and 26.15 years, over a period of several years. That of all England is 23.46; of London, 27.00; and of Liverpool, 20.00 years.

The following table exhibits the mortality for the several wards or districts into which the city has been divided; and is the only certain guide for efficiently directing measures of a sanitary nature—

TABLE 5.

Mortality in the several Wards of the City.

Wards.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Centre,	14	20	16	11	11	8	17	13	5	6	17	17	155
East,	3	4	1	4	2	4	5	3	0	3	2	1	32
West,	13	3	4	6	2	13	7	2	3	3	3	2	61
St. Ann's,	44	26	27	16	17	43	52	39	29	24	23	21	361
St. Lawrence,	61	35	43	29	41	42	33	29	23	12	17	24	389
St. James,	32	28	21	22	22	36	13	20	15	15	75	22	261
St. Antoine,	17	19	20	15	20	26	25	15	10	4	10	7	188
St. Mary,	43	23	22	20	21	33	30	34	18	9	9	9	271
St. Louis,	35	28	18	26	17	30	21	35	26	12	16	18	282
	262	186	172	149	153	235	203	190	129	88	112	121	2000

Had we it in our power to enumerate accurately the existing population of the several wards, the deductions would be then rendered extremely valuable. By the Act of the Provincial Legislature incorporating the city, it was originally divided into six wards—the East, Centre, West, St. Mary's, St. Lawrence, and Queen's, and this division held until the obtention of a supplemental Act in 1845; in virtue of which it is now subdivided into nine wards—the St. Mary's Ward being divided into two, the St. Mary's and St. James; the St. Lawrence, into the St. Lawrence and St. Louis; and the Queen's Ward, into the St. Ann's and St. Antoine. The last census of the city was taken in 1844, and the total population was then returned at 44,093 souls. The numbers in the several wards being apportioned as follow:—

West	Ward	2,285
East	"	1,912
Centre	"	1,805
Queen's	"	13,578
St. Lawrence	"	12,285
St. Mary's	"	12,228
		44,093

The above return is generally regarded as below the actual population at the time; but, however this may be, I do not think we would be far wrong in estimating it at 50,000 for the year 1846; which would exhibit an increase of 5,907. And this increase may be not inappropriately divided between the suburban districts, as, from the peculiarities of the city districts, no great increase can be looked for in them. Dividing, then, the increase equally between the suburb wards, the respective populations would stand as follow from which we may estimate the rate of mortality in each:—

	Population.	Mortality.	Per Cent.
West Ward.....	2,285.....	61.....	2.66
East Ward.....	1,912.....	32.....	1.67
Centre Ward.....	1,805.....	155.....	8 58
Queen's Ward, { St. Ann's, St. Antoine, }	15,547.....	549.....	3.53
St. Lawrence Ward, { St. Lawrence, St. Louis, }	14,254.....	671.....	4.70
St. Mary's Ward, { St. James, St. Mary's, }	14,197.....	532.....	3.74

The per centage obtained for the Centre Ward appears most disproportionately high; but we must bear in mind, that this high rate is caused by the deaths at the Hotel Dieu Hospital, which are thus made to bear heavily on the smallest ward population. At the Montreal General Hospital, in the St. Lawrence Ward, there were only 61 deaths during the year, a number affecting the per centage for that district only by a fraction. Judged, then, by the statistics before us, the St. Lawrence Ward is the most unhealthy of the three general suburban divisions of the city, a result most certainly at variance with our preconceived opinions on the matter. Next stands the St. Mary's Ward; and, thirdly, is the Queen's Ward, embracing the St. Ann's, St. Joseph, and St. Antoine Suburbs. We have no doubt, however, that the St. Ann's Suburbs would be found, had we only an accurate return of its population, the most unhealthy suburb about the city. The mortality in it being counterbalanced by the comparative salubrity of the other suburbs comprised in the same municipal division along with it, the whole thus exhibits a low per centage in the table before us, which is we feel persuaded but apparent, and dependant on the cause alluded to.

The proportion of those who die, either before, during or immediately after birth, and included erroneously under the head "still-born," is singularly high for the year. The monthly proportion of these cases stands as follows:

January.....	10	July.....	6
February.....	7	August.....	7
March.....	9	September ...	8
April.....	6	October	5
May.....	9	November ...	6
June.....	9	December....	8—Total, 90.

Intimately connected with this subject is the temperature and barometric pressure. I conclude, therefore, this paper, by an enumeration of the maximum, minimum, and mean, monthly temperatures, and barometric altitudes, deducing finally the means of the year—

TABLE 6.

	Thermometer.			Barometer.		
	Max.	Min.	Mean.	Max.	Min.	Mean.
January.....	+40°	—13°	+17 56	30.50	29.30	29.99
February.....	" 37	" 12	" 11.32	30.50	29.34	30.03
March.....	" 50	" 6	" 33.55	30.50	29.28	29.97
April.....	" 71	+27	" 48.1	30.60	29.60	30.08
May.....	" 88	" 33	" 69.9	30.23	29.45	29.80
June	" 96	" 43	" 68.83	30.37	29.60	29.93
July.....	" 96	" 52	" 75.	30.40	29.59	29.91
August.....	" 95	" 54	" 69.	30 29	29.65	29.68
September....	" 95	" 42	" 66.53	30.47	29.43	29.96
October.....	" 74	" 20	" 43.5	30.77	29.66	30 06
November...	" 65	" 17	" 38.3	30.66	29.12	30.03
December	" 38	— 2	" 18.9	30.57	29.22	29.96
Mean.....	+70.41	+21.25	+46.69	30.48	29.35	2 9.95

Montreal, September 2nd, 1847.

ART. XXV.—I. *Geological Survey of Canada—Report of Progress for the Years* 1845-6; *and*

II. *Geological Survey of Canada—Report of Progress for the Years* 1846-7.

Exploration Geologique du Canada—Rapport de Progrés pour L'Annee 1846-7.

By W. E. LOGAN, Esq., *Provincial Geologist.*

(THE SUBJECT CONCLUDED.)

While rejoicing at the appearance of the latter of the above works, in its twofold dress, we cannot refrain from commencing our present article by calling to mind the rather mortifying historical fact, that though the interesting mineral region, bordering on Lake Superior, to which our notice is now directed, had attracted the attention of travellers and traders more than two centuries ago, and the early French Governors of Canada soon became sensible of the value of establishing a footing on its immediate borders, such as at the Sault St. Marie and the great trading post of Michilimackinac; so entirely was it gradually lost sight of, except by the fur-trading North-West Company, after the country passed into the possession of Britain, that its shores were seldom afterwards visited by English travellers, and it would, perhaps, have ere long become comparatively unnoticed and unknown, but for the late startling movements of our more enterprising American neighbours. Nor, unfortunately, is this all; for, but for the equally unaccountable and disgraceful apathy and ignorance evinced by our Ministers and their accredited agent at the conclusion of the old American War, instead of the British boundary line diverging northward through Lakes Huron and Superior, it would have held a legitimate direct course westward along the 42d degree of latitude, from the head of Lake Erie to the southern extremity of Lake Michigan, and thence to the Pacific Ocean; and thus have not only included the whole of Lake Superior, but the great Peninsula of Michigan, and the fine country included within the upper portion of the fertile basins of the Mississippi and Missouri, as well as the *then undisputed whole* of the Oregon Territory to the bargain! Well and truly, therefore, might the miserable British diplomatic agent weep on afterwards discovering the awful irretrievable sacrifice which he had made.*

"Mais, on a changé tout cela!"—so, gentle reader, let us, "revenons à nos moutons," in good humour, and be content to take things as they are, and follow the track of our worthy Provincial Geologist. Before doing so, however, we deem it advisable to present you with a short chronological sketch of the various sources of progressive information regarding this now greatly sought after region,—together with a rapid bird's eye view of its general geographical features.

It would appear from various authorities* that French Missionaries were settled in Michigan so early as 1624, and had visited Michilimackinac in 1634, and that eight years afterwards Fathers Isaac Jogues and Charles Raimbaut went, by invitation, to visit the Indians occupying the country in the vicinity of the rapids of St. Mary; that Father Mesnard, a Jesuit Missionary, was with the Indians *on Lake Superior* in 1661, and that in 1665 Father Alouez, another Missionary of that order, traversed that and the other Northern Lakes, and three years afterwards, with Fathers Dablon and Marguette, formed a missionary settlement at the Sault St. Marie.

The country becoming thus known, Mons. Talon, the French King's Lieutenant in Canada, took measures for securing to his royal master the sovereignty over all the North West, through the agency of Mons. Nicholas Perrot, a man of capacity and education, who, at an appointed meeting of nearly the whole of the northern tribes of Indians at the Sault St. Marie, went through the ceremony of taking formal possession of all the country occupied by them, and receiving them under the gracious protection of his sovereign.

Mons. Talon was recalled at his own request in 1672; and left the subsequent more extended discoveries, including the source and course of the great Mississippi, to be achieved by Hennepin, Tonti, La Salle and La Hontan, under the government of his successor, the Count de Frontinac.

Father Hennepin, (afterwards the discoverer of the Mississippi), visited Michilimackinac and the Sault St. Marie in 1678, and the following year accompanied Mons. La Salle, (in a small vessel of about 60 tons, built by the latter a short distance above the falls of Niagara,) on an exploring and trading voyage up Lakes Erie and Huron, to Green Bay in Lake Michigan, when La Salle sent back his vessel with a cargo, while himself and the rest of his associates proceeded to the southern part of Lake Michigan, where they were, by appointment, to wait the return of the ship. That event, however, unhappily never took place, the vessel having foundered on the Lake, and nothing afterwards heard of either her or her crew.

* It is on record that Mr. Oswald, the British agent, on that eventful occasion, when convinced, on his return to England, of the enormity of the blunder he had made, actually burst into tears; while the wily Franklin, on the other hand, exultingly told his English friends, "that they had now nothing to do but to send Deputies to the American Congress!"

* See Hennepin's, La Houtan's and Charlevoix's Travels, passim.

In 1688, the Baron La Hontan made a similar trading voyage down Lake Michigan, accompanied by a large detachment of French, and five Ottawa hunters, provided with new canoes filled with provisions, munitions of war, and articles of traffic; and thus was established a considerable trade with the Indians of this region, which continued gradually increasing, till in 1779 more than 200 loaded canoes passed through the Straits of St. Mary and Michilimackinac on their way to Montreal.

The earliest trading and missionary visitors of this renowned region, having thus incidentally become acquainted with its rich mineral resources, more than one of the published descriptions are found to make mention of the circumstance; but Charlevoix in particular, who visited Lake Superior in 1721, remarks that large pieces of copper were found in some places on its banks, and round some of the islands, which were objects of superstitious worship among the Indians, and that formerly a huge rock of this metal was to be seen elevated a considerable height above the surface of the water, but which having disappeared, they pretended that the Gods had carried it elsewhere.

In later times, Lake Superior still continued to attract the attention of a few British travellers as well as speculators; for in 1766 it was visited by the enterprising Captain Carver,* who travelled all round its North and West shores, and gives a very interesting, though unscientific account of his progress, and among other things mentions the abundance of copper ore, together with the fact, that a Company of adventurers, from England, began soon after the conquest of Canada to bring away some of the metal, but that the distracted state of the times had obliged them to relinquish their scheme.

In 1771, Mr. Henry, another traveller, who was probably connected with the Mining Company above alluded to, dug a considerable mass of native copper out of the alluvial soil, on the bank of the Ontonagon, and together with a lump of silver ore of about 8 lbs. weight, transported it to Montreal, and from thence shipped it to England, where the latter was deposited in the British museum.†

Eighteen years afterwards, i. e., in 1789, Mr. McKenzie in his description of Lake Superior, mentions that on the south side of the same river, called by him the Tennagon, was found a quantity of virgin copper; and that as the Americans, soon after they got possession of that country, sent an agent thither, he would not be much surprised to hear of them employing people to work the mines; and further adds, *that it might be well worth the attention of British subjects to work those on the north coast*, though they were not supposed to be so rich as those on the south side of the Lake.

It would appear that the attention of the United States Government was first turned towards this mineral region during the Administration of President Adams—when the sudden augmentation of the American Navy rendered the employment of domestic copper an object of political as well as pecuniary moment; and a special mission was accordingly authorised to proceed to Lake Superior; but the report of their success has never been communicated to the public. In the meantime, however, the singularly rapid rise of the new State of Michigan, and more lately of that of Wisconsin, stretching along the southern borders of the Lake, coupled with the great commercial impetus given by the command of the uninterrupted navigation of the great Mississippi, soon thoroughly impressed the American Government with the great value of the mineral resources of Lake Superior, and led to the geological structure of its southern borders being accurately investigated by various scientific individuals, among whom Mr. Schoolcraft,* and the late lamented Doctor Houghton,† deservedly take the lead.

On the British side of the Lake, also, two meritorious efforts were of late years made, under Government auspices, to bring this distant region into greater notice:—the one by Doctor Bigsby in his interesting geological researches along part of the north coast of Lake Superior, and afterwards on the N. W. shores of Lake Huron in

* See Carver's Travels through the interior of North America, in 1766-7-8,—published in 1788.

† Mr. Henry was connected with a Company which had been formed in England, for the purpose of working the Copper Mines of Lake Superior, among whom were the Duke of Gloucester, Sir William Johnstone, and other gentlemen of rank. They built a small vessel at Point aux Pins, six miles above the Sault St. Marie, and a considerable sum of money was expended in exploring the north shore of the Lake, and the island of Maripeaux, and afterwards in the mining operations which were authorized on the banks of the Ontonagon, on the south shore. It appears, however, that it was not for the exportation of copper only that the Company was formed, but with a view to the *silver*, which it was hoped the ores, whether of copper or lead, might contain;—but as the expense of conveying the copper to Montreal exceeded its market value, the speculation was abandoned.

* Mr. Schoolcraft visited Lake Superior in company with Governor Cass's expedition in 1820, and furnished an interesting official report on the copper ore of Lake Superior, with historical citations and miscellaneous remarks,—for which see the third volume of the American Journal of Science, p. 201 to 216.

† The death of Dr. Houghton, late geologist of Michigan, took place in October, 1845, and is to this day deeply deplored by his fellow citizens, as an irreparable event; and it may be equally regarded as such by the scientific world at large. After being zealously and unremittingly employed for ten years in developing the natural resources of his country, but more particularly those connected with its geology, it was his misfortune to be lost in a sudden storm on Lake Superior, while investigating in an open boat the peculiarities of the mineral region extending along its southern borders. The value of Dr. Houghton's services to his "calculating" countrymen may be easily inferred from the apposite remark of General Cass, on hearing of his death, that "Michigan had better owe ten millions!"

1819,-20;* and the other in Capt. Bayfield's valuable geological investigations during an elaborate survey of the whole circuit of Lake Superior, in 1825.† But, as is well known, no attempt was made by our unusually apathetic countrymen to turn the explorations of these scientific men to account, until the sudden out-burst of what may, comparatively, be termed the Mining Mania, about two, or at most, three years ago, actually forced upon the Provincial Government the necessity of the Geological Survey now before us.

We now propose to take our promised rapid bird's eye view of Lake Superior and its environs, from the various authorities within our reach;‡ but even the best description would fall short of satisfactory without the aid of a Map,—a desideratum which we are unable to supply, and the absence of which, as an accompaniment to the Report now under review, is almost inexcusable.

Lake Superior, or "the Upper Lake," called by the Indians Keetchagahmi and Mississawgaiegon, the largest and most elevated of those magnificent inland fresh water seas, which, in this part of America, seem to occupy the place of great mountains in other countries, is situated between the meridians of 72. 14. and 84. 34., west longitude, and the parallels of 49. 1 and 46. 25 north latitude; and is in the form of an irregular oblong basin, measuring, in a curved line from S. to W., about 550 miles, and in its greatest breadth about 150 miles; but following the sinuosities of its coasts comprehending a circumference of not less than 1500 miles. Of this extensive line of coast the British portion occupies two thirds of the northern shore, extending from the Sault St. Marie on the East, to Pigeon River on the West; and the American States of Wisconsin and Michigan claim the rest, from Pigeon River trending S. W. to the mouth of the St. Louis, at the Fond du Lac, or head of the Lake, and thence East along the whole of the Southern shore to the Sault St. Marie.

The surface of Lake Superior is 52½ feet above that of Lake Erie, and is estimated at from 617 to 623 feet above the tide waters of the Atlantic; and the bottom of its basin about 500 feet below it, which will give a depth of near 1,200 feet, but it is in many parts without soundings. Its water is always extremely cold, and as clear and pure as any in the world. It has been ascertained that there is no regularly periodical rise and fall, or tide, in its waters, as was once supposed; but such frequently occurs from accidental causes, such as after a very severe winter, without occasional thaws, or the usual amount of evaporation; and a temporary rise also often takes place at one or other extremity of the Lake, when acted upon by severe gales from particular quarters.—These, however, never exceed a few feet in height.

It is a remarkable philosophic fact, that the variation of the magnetic needle on Lake Superior varies not less than from 2° 42′ to 12° 8′, East; and that in some particular places the needle is so disturbed by the magnetic oxides which enter into the composition of its rocks, as to be nearly useless. The deviation increases gradually from the east end of the Lake westward; but it is greatest near the grand Portage and Isle Royale, towards its western extremity.

The environs of Lake Superior are also peculiarly subject to sudden storms, and transitions of temperature, as well as to dense fogs and mists, arising from the im-

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* See Journal of Science, Literature, and the Arts, No. 35—Dr. Bigsby on the geology and geography of Lake Superior. For the result of his investigations of the geological and mineralogical character of the N. W. portion of the shores of Lake Huron, see an interesting article in the third volume of the American Journal of Science, to which is appended the following remarkable extract of a letter from the author:

"The want of a more detailed topography of this district is generally felt. From its length and tediousness, it is incompatible with the plan and interests of a periodical work. I hope the epitome I have prefixed will suffice. It would have been impossible to have furnished engravings for all the organic remains. Their description occupies 56 pages; the topography and geology, with its appendix, fill 120 pages of matter equally condensed with those now before you. *This has been presented to the Earl of Dalhousie.*"

And thus, it is painful to add, were the scientific labours of a highly talented individual consigned to eternal oblivion, on the cobweb-veiled shelves of a government secretary's, or commissioner of crown lands' office. As a contrast to which may be quoted the following acknowledgment of the value attached to topographical surveys by our American neighbours, as expressed by the State topographer of Michigan:—"The mutual connection established, by the Act of the Legislature, between the geological and topographical departments has not only enabled the latter to proceed with greater rapidity, but has furnished to the office through the assistance of those engaged in the geological department, an immense amount of topographical information, which it would have been impossible otherwise to collect." And again: "To prevent Michigan from being a mere thoroughfare for emigrants, . . while the best portions of our state are passed by, justice to the reputation of our soil demands a description, the correctness of which would more than maintain its deserved reputation. If the benefits of correct topographical maps are not obvious to the minds of all, they are not the less real. The durable reputation of the state is too deeply concerned to leave to circumstances merely, or to fortuitous information, the decision, whether a residence in Michigan is preferable to one beyond it; nor can we expect that without the information that such maps afford, the country will either be known or appreciated."

† Captain Bayfield's merits are too well known in Canada, to require any commendation from an anonymous writer. We cannot, however, resist the pleasure of congratulating our countrymen on that able officer having been again selected to be of service to the colony; and we are persuaded that in whatever sphere he may be employed he will do it ample justice. The interesting geological paper above alluded to forms the leading article of the 1st vol. of the Transactions of that meritorious association, *the Literary and Historical Society of Quebec*, and is entitled:—"Outlines of the Geology of Lake Superior, by Commodore Bayfield, Royal Navy, member of the Astronomical Society of London, and honorary member of the Literary and Historical Society of Quebec."

‡ See the authors already alluded to, together with Martin's History of the British Colonies, vol. iii., and, also, Bradford's Notes on the North West, and St. John's Mineral Regions of Lake Superior.

mense evaporation constantly going on. The mean temperature on shore in summer, is about 65, and on the Lake about 61; but instead of the winter being "horribly severe and cold," as has hitherto been the general impression, the experience of three winters has proved the reverse. It is true that the snow is on an average three feet deep, but the mercury during the past three years at Copper Harbor on the south shore, sunk only once below zero, and that was to 6°, while the average was 4° above zero; and the Lake never freezes more than a few miles from the shore. The winter must therefore be milder than at Montreal.

Both the Lake and its numerous Rivers abound with fish—among which are trout of different kinds, weighing from 12 to 50 lbs, sturgeon, white-fish, pike, pickerel, carp, bass, herrings and numerous other species.

The usual forest trees noticed along its borders, are, white and yellow pine, oak, hemlock, spruce, birch, and poplar, with a mixture of elm, maple, and ash upon some of the rivers' banks.

It is stated that no less than 220 tributary streams flow into this vast basin; but of these, very few have a course of more than 150 miles; notwithstanding which, it is conceived that a greater volume of water is poured in, than finds an outlet by the St. Mary, or can be accounted for from even the immense evaporation going on; and it has been therefore inferred that some subterraneous means of communication exist between it and the lower Lakes, as surmised to be the case between the Mediterranean and Eugine.

Some of the Streams on the South, or American side of the Lake, (which are said to be 139 in number), have a course of about 150 miles, and the principal ones, such as the Ontonagon, Copper-mine, Montreal, Mauvaise, Bois Brule and St. Louis, (which is regarded as the head of the great St. Lawrence), communicates by short portages with the Mississippi.

The chief Streams on the Northern, or British side, are the Kamanitiquia, the Black River, the Nipigon and the Michipicoten, all of which have their sources in the great Northern height of land, and are more or less connected by portages with the rivers flowing into the Polar Sea, and Hudson's Bay. Of these the Kamanitiquia, which is the most western, has its rise in an extensive marsh on the summit of the dividing ridge or rather table land, and falls into Lake Superior at the Hudson Bay trading post of Fort William, between 30 and 40′ N. N. E. of Pigeon River. The Black River disembogues into a Bay of the same name about 70 miles further to the N. E., and the Nipigon into Nipigon Bay, still further East, and the Michipikoun appears to be formed of two branches, which united near their efflux into the Lake at the harbour of Michipikotin, another of the Hudson Bay Factories, about 100 miles N. by W. of the Sault St. Marie.

Numerous islands exist in various parts of the Lake, some of considerable size. Isle Royale is 45 miles long by 7 or 8 broad; Caribou about 11 miles in circumference; and the Islands of the twelve Apostles are 23 in number, with perpendicular cliffs of sandstone on the N. and S. E., 60 feet high. At Les Portailles and Grand Island there are perpendicular sandstone cliffs broken into the most beautiful and picturesque arches, (some of which a boat could pass under), porticoes, columns, and caverns of immense dimensions.

The south shores of the Lake are in several places rocky, considerably elevated, with occasional large sandy bays, and bold jutting promontories. The great promontory or peninsula of Keenanowan, in particular, which divides it into two nearly equal sections, is very lofty at its central part, consisting of steep conical granite hills 1000 feet high; and there are other ranges 1500 feet above the level of the Lake, and consequently more than 2100 feet above the Ocean.

The line of rocky hills constituting the north shore of the Lake consists of rocks and crags piled upon each other to the height of 150 or 200 feet at the north end, and 400 to 450 at the south end, where they dip into the Lake from an elevation of 300 feet, in advanced broken scraps towering successively on each other. Along the eastern part, from Gros Cap to the River Michipicotin, (a distance about 125 miles), are several promontories and beautiful bays and rivers, among which are Batchegwaung or Batchewine, and Huggewong Bays, off the mouth of the latter of which is the Island of Montreal or Hogguart. The west end of the Lake, termed the *Fond du Lac*, is a slowly contracting *Cul de sac*, commencing at the promontory opposite the Twelve Apostles, and running 80 miles in length, with a breadth of 8 to 10 miles at the bottom, where it terminates in the River St. Louis.

It only remains to be added, that the great rapids by which travellers enter Lake Superior, termed the Sault St. Marie, or Falls of St. Mary, are about three quarters of a mile in length, by half a mile in breadth,—the river being here narrowed by a broad tongue of land protruding from the north shore, and affording a site for the store-houses of the Hudson's Bay Company. They are fifteen miles from the Lake, and have a descent of 22 feet 10 in. in 900 yards, and consists of swift flowing billows and broken whitened waters hurried with velocity over a slope of ledges and huge boulder stones, through a thickly wooded country, whose want of elevation on either shore, has permit-

ted the formation, on each side, of a number of islets divided by channels, the beds and sides of which are lined with huge rolled masses similar to those found in the Lake. Above the rapids, the St. Mary flows through a well-wooded country, in a bed from a mile to a mile and a-half wide, and without any apparent current till within a mile and a-half of their commencement; and immediately below them it widens to upwards of a mile, before entering Lake Superior.

Having thus formally introduced our readers to the great field of Mr. Logan's geological labours, we must now allow him to speak for himself through the medium of such condensed extracts as our remaining space will allow.*

"Leaving Montreal on the 1st day of June, and joining my Assistant Mr. Murray at Detroit, where he had been engaged in completing arrangements for our expedition, we proceeded to Sault Ste. Marie, accompanied by Mr. McNaughton, the Provincial Land Surveyor appointed by the Government to survey *topographically* the various mining locations,† the mineral veins of which it was another portion of my task to inspect, with a view to aid in determining the direction most consistent with the general interest, to be given to their bounding lines, in cases of collision between the lots of neighbouring claimants.

Mr. Murray's attention was devoted to the examination of the Kamanitiquia and Michipicoten Rivers, both of which he ascended to near the height of land, in addition to the inspection of several sections of the coast, his Report upon all of which, I have now the honor to transmit.‡ My own time was bestowed upon an examination of the mining locations and the coast generally; and finding it was in my power to work in advance of the land surveying party, I was happy to avail myself of the obliging offer of Mr. W. N. McLeod, who put at my service his canoe and eight voyageurs to transport me round the shores of the lake, by which I was enabled to make a more extended inspection than it would otherwise have been possible for me to effect in the limited time one season could afford. With the exception of Mr. Murray's excursion up the two rivers mentioned, the examination has necessarily been confined to the coast, and cannot be considered more than a *reconnaissance* of the district, to be carried into further detail at a future period as occasion may serve.

The Canadian shores of Lake Superior in general present a bold and rocky coast, diversified in the character of its scenery in accordance with the distribution of its different geological formations. Cliffs and eminences rise up to heights varying from 300 to 1300 feet, close upon its margin, and this, deeply indented in some parts with extensive bays, and in others presenting extensive clusters of islands, is in a multitude of places carved out into well sheltered coves and inlets, affording innumerable harbors of a safe and commodious character, destined greatly to facilitate whatever commerce may hereafter be established on the lake, whether in the produce of its mines or its fisheries. The timber of the district does not seem to promise much encouragement to traffic; it is not of the size, nor of the kinds most esteemed in commerce, though there is much useful wood capable of being rendered available for mining or house-building purposes, as well as for fuel.—Hard-wood is scarce, red pine is not often seen, and white pine not abundant. The trees most common are spruce, balsam fir, white birch and poplar, with cedar in moist places. On the immediate coast, many of the hills are nearly denuded of trees, particularly where granite and gneiss prevail. The hills composed of trap are better clothed; but it is in the trappean valleys and on the surfaces underlaid by sandstone, which are usually flat, that the largest growth is met with. It is chiefly in these localities also, and at the mouths of some of the principal rivers, that is to be found whatever land may be fit for cultivation; and although of this, in comparison to the area of the district, the extent cannot be called great, nor such as even less remotely situated, would tempt settlement, sufficient would probably be found to supply many of the wants of a mining population, should the metalliferous minerals of the region be found on trial to exist in sufficient abundance to be worked with profit.

Several considerable streams fall into the lake, the chief of which are the Kamanitiquia, the Pic, the Michipicoten, the Neepigon, and the Montreal. The first three flow in on the north, and the other two on the east side; and the whole, taking their origin in the height of land separating the waters of Hudson Bay from those of the St. Lawrence, may pass through 100 to 200 miles of country before yielding their tribute to the grand head reservoir of the latter, which with a rim of 500 leagues, comprises an area of 32,000 square miles, its greatest length being 300 miles, and its greatest breadth 140 miles. Its greatest depth is supposed to be 1,200 feet, which would make its bottom 603 feet below, while its surface is 597 feet above the level of the sea; and its mean depth, being taken at 600 feet, would give about 4,000 cubic miles of water.

The frosts of winter are not sufficiently long continued to cool, nor the heats of summer to warm this great body of water to the temperature of the surrounding surface, and the lake in consequence considerably modifies the temperature of the country on its banks, which is neither so low in the one season, nor so high in the other, as it is both to the east and to the west. In the middle of the lake, on a calm day of sunshine, on the 7th of July,* it surprised me much to find that the temperature of the water at the surface was no more than 38° Fah. For this fact, which was ascertained by repeated trials, it appears difficult to account, even allowing a degree or two for inaccuracy in the construction of the thermometer; as it is known that water attains its greatest density at 39½°, and hence it might be expected that the body of the lake having once attained such a density, the stratum of particles at the surface would maintain its place, and be readily either cooled or heated. But whatever might have been the cause, a consequence was that the temperature of the atmosphere above the lake was no more than 51°, while in the interior of the country it may probably have been 70° and 80°, or more. The result of such differences is the great prevalence of fogs on the lake, the vapour, brought in warm currents of air from the interior land, becoming condensed over the cool water of the surface.—These fogs, as was to be expected, appeared to diminish in frequency as the summer passed away, but it is probable they would increase again in winter by a reverse of the process, the lake giving the vapour and the land the condensing currents of air.

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* As Mr. Logan's researches were of course confined to the northern or Canadian shores of the Lake, it may be proper to note that those who desire full information respecting the southern or American side, can consult Schoolcraft's Report already alluded to; Dr. Houghton's Geological Reports; Bradford's Notes on the North West; St. John's description of the Lake Superior Country and Copper mines, &c. &c.

† In a former number we adverted to the admirable spirit of economy which characterises all our public Departments, but more particularly connected with the Geological Survey of the Province—as exemplified in the loan of *one-half* of Mr. McNaughtan to that important object. Fortunately, this bisection must have been so ingeniously contrived as to include both the *head* and *heart*, as we find him once more, "all alive and leaping," in company with Mr. Logan on the shores of Lake Superior. It strikes us, however, that this commendable economy, has been carried too far in the exemplary *Parliamentary printing*,—as the "Topographical" labours of Mr. McNaughton, if worth any thing—instead of being destined to slumber—*ad sempeternum*—in the pigeon-holes of the Crown Land Department, ought to have been incorporated with the Report of the Provincial Geologist, along with that of the Assistant Geologist, as is very creditably done in the various American States.

"There's something rotten in the state of Denmark."

We are, at all events glad to meet our old friend again in such good company, although it may still, after all, perhaps, be only *by halves!*

‡ Want of space compels us to omit giving extracts from Mr. Murray's Report.

* In the same month in 1766, Captain Carver, on letting down a cup to the depth of a fathom, found the water drawn up so cold that it had the same effect when received into the mouth as ice.—*Carver's Travels*, page 133.

SUCCESSION AND DISTRIBUTION OF ROCKS.

Lake Superior appears to be situated in a geological depression which presents formations of a similar character on both the north and south sides, dipping to the centre. The series on the north, in ascending order, consists of the following :—

1. Granite and syenite.
2. Gneiss.
3. Chloritic and partially talcose and conglomerate slates.
4 Bluish slates or shales, interstratified with trap.
5. Sandstones, limestones, indurated marls, and conglomerates, interstratified with trap.

The rock at the base of the series is a *granite*, frequently passing into a syenite by the addition of hornblende, but the hornblende does not appear to be often present wholly without the mica.—Both the mica and the hornblende are in general black, the quartz either opaque or translucent white, or colourless and transparent. The colour of the feldspar is usually some shade of red, either pale or deep, and this being the prevailing constituent mineral, gives in most cases a reddish tinge to the mass.

The granite appears to pass gradually into a *gneiss*, which seems to participate as often of a syenitic as a granitic quality. Both the gneiss and the granite are very often traversed by an ancient system of dykes or veins of a granitic character, usually firmly soldered to their walls, from which they have no peculiar tendency to split off, and they sometimes appear to constitute for limited areas, nearly as much of the mass they cut as the original rock itself. There do not appear to be any metalliferous minerals associated with these veins.

The gneiss is succeeded by *slates* of a general exterior dark-green colour, often dark-gray in fresh fractures, which at the base appear occasionally to be interstratified with beds of a feldspathic quality, of the reddish colour belonging to the subjacent granite and gneiss; sometimes they are a combination of feldspar and quartz, occasionally with the addition of hornblende, making syenitic beds; and in some the hornblende preponderating, will give the syenite a general green colour. Some of the beds have the quality of a greenstone, others that of a mica slate, and a few present the character of quartz rock. Rising in the series, these become interstratified with beds of a slaty character, holding a sufficient number of pebbles of various kinds to constitute *conglomerates*. The pebbles seem to be of various qualities, but apparently all derived from hypogene rocks. A considerable thickness of these conglomerate or pebbly slates is exposed at the mouth of the River Doré, near Gros Cap, about five miles from the mouth of the Michipicoten River. * * *

Reddish-yellow feldspathic dykes occasionally traverse the slate as they do the granite and gneiss beneath; but the veins which more peculiarly appertain to the formation, are composed of translucent white quartz: they vary in thickness from a few inches to several feet, and are found running both with the strike and transverse to it. They were not observed on Lake Superior to carry any great amount of metalliferous mineral. Iron pyrites was sometimes associated with them, but not in large quantity.

Bluish Slates or Shales, interstratified with Trap, rest unconformably upon those already mentioned. The base of the lower one, when seen in Thunder Bay in contact with the subjacent green slates, presents conglomerate beds probably of no great thickness, composed of quartz pebbles chiefly, with a few of red jasper, and some of slate in a green arenaceous matrix, consisting of the same materials in a finer condition. These are followed by a set of very regular even layers of chert, sometimes approaching a chalcedony, varying in colour from nearly white, through different shades of gray, to black, and in thickness from half an inch and less, to six inches, and sometimes even a foot. * * *

Reposing on the formation which has just been described, the first rock met with in Thunder Bay, where the best development of the lower part of the succeeding series occurs, is a white *sandstone;* the strata are in general of a fine grit, and appear to be composed almost entirely of minute grains of quartz in some parts, and in others small rounded white grains of a calcareous quality are sparingly intermingled with them. Some beds are coarser than others, and in these rounded pebbles of quartz and occasional jasper are seen, seldom exceeding the size of buckshot; of these white grits there may be a thickness of about 200 feet. They are followed by sandstones consisting of red and white layers interstratified with one another, and associated with conglomerate beds composed chiefly of pebbles and boulders of coarse red jasper, held in white, reddish, or greenish sand, as a matrix. Rising in this part of the deposit, the beds appear to hold rather more calcareous matter than those below; and some of the conglomerates enclose patches of limestone with fragments of chert, succeeded by limestones of a reddish-white colour, and very compact texture, some of which would yield good material for burning, interstratified with calcareo-argillaceous shales and reddish-white sandstones, with an addition of reddish indurated marl at the top. Succeeding these calcareous strata, red and white sandstones occur with conglomerate layers. The red sandstones are often very argillaceous; they are usually variegated with green spots, and ripple-marks and crack-casts are displayed on the surfaces of many beds. The sandstones and conglomerates become interstratified with trap layers, and an enormous amount of volcanic overflow crowns the formation. The trap taken as a whole is a greenstone. It is in general of an amygdaloidal character, less so at the bottom than higher up, while at the top, in addition to the amygdaloid, there are met with extensive masses of a more solid and more highly crystalline quality, sometimes passing into well marked columnar basalt, associated with others of a vitreous aspect, exhibiting the forms of pitchstone-porphyry and pitchstone. The minerals filling the cavities usually consist of calcspar, quartz in various forms, and abundant in that of agate, together with Prehnite, epidote, native copper, specular iron, and various zeolites. These cavities are of various sizes and shapes; some, often containing agate, were six or eight inches in diameter, and instances were met with where the cavities presented the shape of irregular vertical tubes of about a quarter of an inch in diameter, running up several inches, into a bed from the bottom. On the surface of some of the beds, partially concentric wrinkles resulting from the flow of the volcanic matter when in a viscid condition, were strongly marked.

Though the two last described formations, and indeed all along the coast, the whole, down to the granite, are traversed by a vast collection of trap dykes, yet in no one instance were any of the overlying or interstratified volcanic layers traced to a connexion with them of such a nature as to display to the eye that the one had its source in the other. The qualities of these dykes may be ranged under the denominations applied to such volcanic products in their relation to greenstone, porphyry and syenite, but those of a porphyritic and syenitic character bear but an insignificant proportion to the greenstone dykes, to which, in part at least, the others are closely allied. They in general appear to be more durable than the rocks they cut, from which results a peculiarity in the geographical features of the country. The destructive action of the water upon the coast is partially arrested in its progress upon meeting with them, and the dykes which run with the strike are in consequence often found to shield the shore for considerable distances. They sometimes run out into long prongs or promontories, with deep recesses behind them, or present a succession of long narrow islands, which act as break-waters in defending the neighboring main land; and it frequently happens that a narrow breach having been effected in a dyke, it will be found to be the entrance to a spacious cove worn out on each side in the softer rock behind it. In almost all these instances, commodious harbours are the result, and it is mainly owing to the presence of these dykes, that so many such harbors exist on the Canadian side of the lake.

In addition to the dykes, a vast collection of *mineral veins* intersect the formations of Lake Superior. A very large number of these contain a greater or smaller amount of various metalliferous ores, and the indications which they present, are such as to render it probable that some part of the country characterised by them, will sooner or later rise into some importance as a mining region. The metals whose ores are met with are *copper, lead, zinc* and *silver.*

As in the case of the dykes, the mineral veins belong to two systems; one coincident with the range of the rock masses, and the other transverse to it. They are therefore parallel to the dykes. The cracks, however, which the veins occupy, appear to be of an age subsequent to that of the dykes. They sometimes run along side of them, having the dyke for one wall and the rock of the country for the other, while at other times they are wholly independent of the dykes.

In respect to the mineral contents of the veins, some difference exists in the different formations. In the upper formation, which is so much associated with amygdaloidal trap, the mineral veins vary in breadth from a few inches to four or five feet. They are in general composed of calcareous spar and quartz, holding together in greater or smaller quantities, entangled fragments of the

wall rocks, and dark green steatite is seldom absent as one of the constituents. Laumonite was very often abundantly present with these minerals, and sometimes exceeded them in quantity; associated with the vein-stones, fluor spar occasionally occurred. Heulandite with heavy spar was not unfrequently met with, and in some districts, the heavy spar occasionally formed the chief earthy mineral in transverse or north and south veins. Prehnite with and without Thomsonite and stilbite was frequently encountered, chiefly in east and west veins; and dyselasite and datholite are to be enumerated among the minerals that occur. Some of the veins, with the strike and transverse to it, were almost entirely composed of chalcedony and agate, when the rock of the country was of the qualities allied to pitchstone, or the porphyry associated with it; but these were seldom found to hold metalliferous minerals.

When metals were present in the mineral veins, they occurred chiefly in the form of sulphurets, with the exception of the silver, which appears to be usually in a native condition even when mixed up with the ores of other metals, unless in the case of galena, with which it is probably united as a sulphuret. The copper also was frequently met with in a native state; it usually, however, occurred in the forms of vitreous copper, variegated copper, and copper pyrites; but it was found also as a carbonate resulting from the decomposition of the other ores where acted on by the weather at the outcrop of a lode. The gangue in those lodes which carried vitreous copper, had usually a predominating quantity of calcareous spar or of Laumonite, and sometimes of heavy spar, while in those possessing pyritous and variegated copper ores, it appeared to be more of a quartzose character. Native copper was usually accompanied by Prehnite. The silver was found associated with vitreous copper, native copper, and galena, the last of which, with blende and iron pyrites, occurred in company with the sulphurets of copper, and was sometimes met with in calcareous spar by itself.

The courses of the metalliferous veins of this formation appear to be different in different parts of the lake, although they preserve uniformity over considerable areas. On the north shore, they run with the system of veins coincident with the range of the rock masses, partaking of an east and west bearing. On Michipicoten Island they belong to the transverse system, and run northward and southward; while at the east end of the lake, with the principal lodes running eastward and westward, transverse to the stratification, there are exceptions, running northward and southward with the strike.

In the succeeding formation, or upper slates, the most conspicuous system of veins consists of those transverse to the stratification. They vary in breadth from a few inches up to twenty feet and more, and they are in general composed of calcareous spar, heavy spar, and amethystine quartz. Apophyllite is occasionally associated with the heavy spar in some of the veins, and dark-green steatite occurs more or less in almost all. Several of them are characterised by small quantities of vitreous copper, variegated copper, copper pyrites, iron pyrites, blende, galena, and silver; and of those lodes among them which came under my inspection, one having all these metalliferous products present, with the addition of cobalt and arsenic detected by my Chemical Assistant, Mr. Hunt, was strongly marked by the vitreous copper, which at the spot where the lode was tried, appeared to exist in a workable quantity. The veins coincident with the stratification cut by these, are in general rather thin. They often run by the side of the dykes, and seem for the most part to consist of a breccia of the wall rocks, held together by carbonate of lime and quartz, while steatite was frequently present. Green and purple fluor spar was found in some of them, and Prehnite, associated with Thomsonite, occurred in others. The only metalliferous minerals, accompanying them were iron and copper pyrites, but it is doubtful whether the quantity of the latter was in any case sufficient to give great promise of profit in working them. One vein coincident with the strike of the formation, was met with on the northwest side of Thunder Bay, which appeared to be an exception to the rest. It was of great breadth, perhaps not under sixty feet, and in its general character it resembled the transverse veins; its earthly minerals being calcaspar, amethystine quartz, and heavy spar, while at the same time it carried small quantities of iron and copper pyrites, galena and blende.

Mineral veins analogous to those of the upper formations were found penetrating the older rocks, but the examination of these has scarcely been sufficient to authorize any remarks respecting them. The vein-stones connected with them appeared to consist chiefly of quartz and calcareous spar, with Laumonite occasionally, and the metalliferous minerals, when any were found, were variegated copper, copper pyrites, galena and blende; but the lodes did not seem to be of such frequent occurrence, as in the higher rocks, nor were those which came under my observation of so important a character.

For the details of the Geographical distribution of the different rocks, we must refer our readers to the Report itself, that we may be able to devote as much space as possible to that portion of it which treats of the economical application of their mineral, or rather metallic resources. There is, however, one interesting passage relating to drifted materials noticed by all travellers, indicative of a succession of former beaches at a much higher level than that of the lake at present, which we cannot venture to pass by altogether:—

On the margin of the lake and on the banks of some of the streams which were examined for short distances up from their mouths, considerable accumulations of drifted materials were observed, consisting of clay, sand, gravel and boulders, derived from the ruin of the rocks which have been described and others which did not appear *in situ;* but no evidence was obtained of the age of these deposits. Some of these accumulations reached the height of 330 feet above the level of the lake, and on the coast generally presented a series of well defined terraces, marking various periods of recession in the water which once covered them. One of the most remarkable is to be found on the north shore, about three miles below the Petits Ecrits, where it displays six terraces in addition to the summit. * * On other parts of the lake, terraces exist which are marked by the wear of the rock as well as of the looser material.

But to the adventurous speculator in these now attractive regions, as well as to the disinterested reflecting enquirer, by far the most interesting and instructive portion of Mr. Logan's Report will consist of that which treats of the economical application of the mineral materials, particularly if combined with the valuable set of tables appended to it. On this important branch of the subject, Mr. Logan makes the following excellent remarks:—

"The occurrence of copper on the Lake Superior coast has been long known. It has been alluded to by several travellers, and one or two unsuccessful attempts of little importance have been made at different periods to obtain it by mining. Captain Bayfield notices the presence of the metal; but it was not until the appearance of Dr. Houghton's Report in 1841, in which the character of the mineral veins containing it was given with more definite detail, that the public mind became directed to the district as a mineral region.

Since that period a rush has been made to the district by the enterprising citizens of the neighbouring Union, with a view to the working of its mineral treasures, and a considerable amount of capital has been embarked in some of their speculations. The whole subject of this mineral region, however, is still so new that the present efforts to turn it to account can only be regarded as an extended exploration, by which a great number of valuable facts will be ascertained, to illustrate the true nature and position of the productive ground; and although it is probable some of the adventures may at present prove successful, a vast number cannot fail to end in disappointment to those concerned in them. But the metalliferous lodes which characterize the rocks of the country are so numerous, and spread over so wide an area, as naturally to excite strong hopes of many valuable discoveries, while they afford a reasonable foundation to expect that a period will at some time arrive, which circumstances may hasten or retard, when mining will become established as a permanent branch of industry in the region, and the extraction and reduction of its

metalliferous ores will form a source of wealth to its future inhabitants.

The same ultimate results may be anticipated on the Canadian shores of the lake, which are characterised by rock formations, and mineral veins of a similar description. These mineral veins are very numerous, and are marked to a greater or less extent by metalliferous indications along several sections of the coast from Pigeon River to Sault Ste. Marie. It is, however, in general a mere narrow strip along the water line which has been inspected, and it is still doubtful how many of the veins which were observed to contain these indications, will yield a present profitable result.

The uncertainties of mining are so great that even after a careful surface investigation, it is often very difficult to estimate with precision the probable value of mineral results. Any opinion in regard to them must, of course, be founded on the quantity of the mineral, the cost of mining it and bringing it to the surface, of dressing or shaping it for, and transporting it to a market, as compared with the price to be obtained for it after its arrival there.—No very great difficulty will perhaps be encountered in any case in ascertaining all the elements of the calculation, with the exception of the first, that is the quantity. With regard to such minerals as are deposited with regularity, the quantity can be ascertained with facility. In the instance of coal, for example, which is almost always deposited in extensive sheets of pretty uniform thickness, the rule is that about 1,000 tons can be procured from every one foot thick of every superficial acre of a bed. But it is not so in respect to mineral veins, the most common form in which metalliferous ores occur.

Mineral veins, as distinguished from mineral deposits, generally occupy what are supposed to be cracks in the rocks of a country, and these cracks are conceived to be the result of upheaving forces which have broken the continuity of the rock, The crack is usually accompanied by a slip or dislocation of a greater or less amount, by which parts in the plane of the crack that do not fit, are brought opposite to one another, giving space for the subsequent secretion of the mineral matter. It is evident that a fissure of this description in which salient parts on opposite sides would touch, and re-entering parts recede from one another, would produce a very irregular mould, and the mineral vein just fitting it, would have a quantity that no *a priori* reasoning could determine with precision.

Mineral veins may be divided into two kinds, distinguished by the suppposed mode in which the cracks may have been filled up. The mineral matter may have been injected from beneath into the mould in a condition fluid from heat, in which case it would be a *dyke*, and the quality would probably have a considerable amount of uniformity; or it may have been secreted by means of deposit from infiltrated fluids holding the mineral substance in solution, or through the influence of electricity, carrying it from the interior of the rock of the country, or wheresoever it may have been within the influence of the electric current, to the receptacle of the vein, or by a combination of both these causes. In this case the almost endless modification of the acting forces may have produced a nearly infinite variation in the arrangement of the mineral substances, in regard to their quality and distribution; and the irregularities thus occasioned would greatly enhance the difficulty of estimating the quantity of the productive part of a mineral vein.

Metalliferous mineral veins, or metalliferous *lodes* as they are termed by miners, are of the complicated description last mentioned. They are sometimes perpendicular, but usually at high angles of inclination, and in general they are filled up partly with metallic and partly with earthly minerals, the proportions these bear to one another being very various in different cases, and often very different in separate parts of the same lode. It often happens that in some part of the lode there will be a very great deficiency of the productive material, both horizontally and vertically, giving intervals of what is termed dead ground.

In a great mineral district such as the Counties of Cornwall and Devonshire in Britain—where 30,000 inhabitants are engaged in working upwards of 160 mines, and the value of the metals annually raised exceeds £1,500,000, more than half the value of the metallic products of Great Britain and Ireland, with the exception of iron—there is a vast amount of floating knowledge in regard to almost all the metalliferous lodes even in their inmost parts, and so many analogies for the solution of neighboring cases are established by the facts ascertained in such an extensive range of excavations—which in some single large mines, taking adit levels, horizontal galleries and vertical shafts equal sixty-three miles—that a fair guess can often be made of the produtive contents of a vein from careful surface inspection. Yet even in Cornwall the hopes of the miner are very frequently disappointed, and adventurers in a new mine are seldom very sure of their operations, until a trial level has been driven longitudinally in the lode, and more than one trial shaft sunk vertically, to ascertain facts upon which to found a calculation of what the produce of the whole mine may be.

The uncertainties in a new mineral region, unless it be one of a very uncommon character, being of course still greater than they are in an old, until the productiveness of a lode has been established by such test-works as have been mentioned, which will require time and a considerable outlay of capital, any opinion hazarded in regard to results must be regarded as very liable to error. But by a careful surface examination, a rude, imperfect, preliminary guess may perhaps be made at the contents of a vein by following its outcrop and taking from as many parts as possible in the run, fair average samples of the whole breadth at such depths as appear to be unaffected by the influence of weather, and assuming these to be an index of the interior quality both vertically and horizontally.

It is probably for the copper contained in the metalliferous lodes of the region in question that they will ultimately be worked, and the proportion of this metal, in those lodes of which it was in my power to obtain what appeared to me to be an approach to average crop samples, varied, according to the analyses of Mr. Hunt, the Chemist attached to the Survey, from two to seven per cent, while the thickness of the lodes ranged from ten inches to about four or five feet, yielding from three quarters of a hundred weight to three quarters of a ton of fine copper in a fathom forward by a fathom vertical of the lodes. Several of them contained traces of silver, although the quantity appeared scracely sufficient in any instance to warrant its separation from the copper; but as the silver is found in the native state and irregularly diffused, analyses of different specimens may give very different results. If these copper lodes were situated in the midst of a practised mining population, and at a moderate distance from favourably located establishments for the reduction of their products, it is probable some of them might at once be worked to advantage; but the expenses attendant upon a region so remote from settlement, where the wages of labour must remain high for a considerable period of time, would require lodes of a more than commonly fruitful character; and if the spot at which the ores are to be ultimately reduced and refined is remote, one of the most serious charges to be encountered is the cost of transport, in proportion to which it will become essential to concentrate the ores as they come from the mine, by dressing, or even partially smelting, if it can be more economically effected.

Since the restriction on the introduction of the produce of foreign mines into Britain has been partially relaxed, copper ores have been sent to the British market from various parts of the world. In the Appendix will be found a table shewing the annual quantity of copper ores, British and foreign, smelted in Britain for the last eight years, from the 30th June, 1838, to the 30th June, 1846, classified according to the general sources whence the ores were derived, with the average produce, and the average price of the ore from each general source, By this it will be seen that the produce rises with the distance.

The average of *Cornwall*, after the ores have been dressed by washing, does not in any one year reach *eight per cent.*, from which it will be readily understood that the portion selected for dressing must have been much lower before the operation, and that the whole quantity of material cut in the mine, must have been lower still. By reference to another table shewing the copper ore publicly sold from each mine in Cornwall for one year to the 31st December, 1845, it will be seen that the produce of some individual mines occasionally does not exceed 4 per cent. even after dressing. The ores of *Ireland*, which have to bear a rather higher charge for transport, are raised to a rather higher per centage than those from Cornwall, the average being over *eight per cent;* While those of *Wales*, which are of less importance, and of which the quantity appears to be diminishing, vary from year to year in the per centage, according to accidental circumstances.—The mines seem to be less regularly worked, and some of them are at much greater distances from the smelting establishments than others.

After Cornwall, the next great source of copper ore is Cuba, from a few mines in which island, with one or two unimportant

additions from other parts on the eastern side of the American Continent, a quantity is supplied equal to more than one-half that raised from all the seventy to eighty mines yielding copper in Cornwall, (some of which appear to be very poor concerns,) and four times as great as the total produce of the copper mines of Ireland. The ores of Cuba are naturally richer than those of Britain, but the charge of transport being considerable, no doubt their per centage is in consequence raised by hand-picking, or some other mode of dressing. In 1839 the average produce was nearly twenty-two per cent, but it has since gradually declined to a little over sixteen per cent. What the reason may be, I am not prepared to state, or to say whether the natural produce has deteriorated, or a diminution in the charges of transport has rendered it less necessary to concentrate the ore by dressing.

The ores from the *Pacific side of the American Continent* are very considerable in value. Until the last year, the value amounted to one-fourth of that of the ores of Cornwall. The average produce in 1839 was nearly 25 per cent, and in 1846 it reached nearly *thirty-four per cent.* To meet the charge of a high freight, a considerable quantity of the ore is concentrated by a partial smelting in South America. * * * * *

The discovery which has lately been made of copper ores in *South Australia* appears to promise a considerable supply. The ores seem to be of an unusually rich quality. * * * * According to the Swansea ticketing-sales, the average produce of 912 tons of the ores received the first year, to the 31st December, 1845, was upwards of *nineteen and a half per cent*, and the average price £16 9s. 9d. per ton of twenty-one hundred weights.—During the year ending the 31st December, 1846, a quantity of 2,718 tons was sold from six mines, yielding £47,379, the average produce being over twenty per cent, and the average price £17 8s. 7d. * * * * * * *

In Britain the copper ores disposed of publicly, are sold at what are termed *ticketings*, which are a species of auctions at which each bidder, being a smelter, or the agent of a smelter, makes a written tender to the salesman for the parcels of ore put up from each mine in succession, all making them simultaneously, and no one knowing what the offers of his neighbors may be, until they are read out by the salesman. Each highest offer thus made, obtains each parcel for which it is bid; and if there are more offers than one at the same highest price, the parcel is equally divided among those making them. The ores of one mine, if the quantity is large, are usually for the convenience of the smelters, divided into lots not much exceeding 100 tons. The simultaneous bids for them having been read out and the parcels allotted, tenders of a similar description are made for the ores of the next mine on the list, and so on until all are sold.

The Cornish ores are disposed of by weekly advertised ticketings held at one or other of a few principal towns in the neighborhood of the mines, and the ores are to be taken as they lie on the ore-floors of the mines, to be weighed, delivered and paid for within one month. The prices which the ores bring at the ticketing-sales determine the value by which the miners who have worked them, on what is called *tribute*, (which is on shares,) are to be paid, and by which the *Lord's dues* (or proportional sum to be paid as rent) are ascertained. Irish, Welsh, Foreign and Colonial ores are usually imported into Swansea, which is the most central town near the chief body of smelters, and there sold by ticketing, to be taken as they lie on the ore-floors of two or three ore merchants, who receive them on consignment and effect the sales on commission.

As each smelter will trust to his own examination only, to determine what copper the ores may contain, he employs his own assayer for the purpose, and keeps his own counsel in regard to the result. But he must of course obtain fair samples of the ores.—In order that all may be dealt with equally, and to save trouble, there is but one sampling of each parcel of ore, at which each smelter as well as the owner has an agent present, and one large average sample being taken, it is subdivided into several smaller samples, of which one is given to each party concerned. If the ore is from abroad, a Custom-house officer obtains a sample, to determine the duty. When ores are imported in a rough or coarse state, it is necessary, for the purpose of fair sampling, that they should be broken down to a size in which no piece will exceed about half a cubic inch. A moderately fine size has the effect of assisting the smelting of the ore. The assay is effected in the dry way, which seldom gives so high a per centage as is obtained in the humid mode, and all metals but the copper are neglected. * * *

The charges made by the ore merchant at Swansea for the various operations connected with the sales of the ores, including sampling, weighing, yard-rent, and his own brokerage, amount to something over five shillings the ton when the ores do not require to be crushed, with two shillings more when they do, and these charges are to be added to freight, insurance and duty, in calculating the probable returns from shipments direct to that port.—As the ore must necessarily be exposed to the vicissitudes of weather, it absorbs a considerable amount of moisture, and there results some wastage in the quantity in moving the ore. An allowance is made to the purchaser of twenty-four and a half pounds per ton for the latter, and of whatever it may be found to amount to by trial for the former. The two together may sometimes reach five per cent of the quantity.

The number of copper smelting establishments in Britain is very limited, but a vast amount of capital is embarked in them. It consists in the stock of copper ore which it is necessary to hold to insure regular work; the ore and partially reduced material in progress through the furnaces; the copper held in various towns to effect sales; the copper absorbed into the furnace bottoms, which is a very considerable quantity, varying from two to two and a half tons in an ore furnace, to about ten to fifteen tons in a refining furnace; and the various furnaces, implements, and buildings constituting the *plant* of the establishment. As will be seen by reference to the Appendix, there are seven houses that bid at the ticketings, whose smelting works are situated within twenty miles of Swansea, and four that purchase ore by private contract only, whose works are chiefly near Liverpool. The situation of the establishments is chosen in reference to the proximity of coal. It requires a greater bulk of coal than of copper ore to make a ton of copper, and hence it is cheaper to carry the ore to the coal than the coal to the ore. At the average produce of the Cornish and Irish mines, the proportion is about three of coal to two of copper ore, and the proportion increases with the increasing produce of the ore, although it decreases of course in relation to the ton of copper. As the furnaces are all of the reverberatory description, it is necessary that such a coal should be used as will yield a flame as well as a strong heat, and it must be sufficiently bituminous to bind together in the grate, and not fall through between the bars unburnt.

According to the British system of smelting, which consists in reducing the ores to a reguline sulphuret, and then oxydizing all the products but the copper, and the less oxydizable metals if there are any, the ores and their products undergo seven different processes of calcination or fusion, in the course of which they are exposed to the action of fire for about one hundred hours. The number of furnaces required to perform these operations, the ores averaging eight or ten per cent, is about equal to one for every forty tons of copper annually made, requiring to work and repair them, the labour of about four men for a week for every one ton of copper. The Cornish yellow sulphurets of copper can be used by themselves. They require calcination in the first instance, by which a portion of the sulphur is evaporated and a part of the iron oxydized. The ore is thus rendered more fusible, oxyd of iron being a flux for silica, while it is at the same time a means of forwarding the reduction, by desulphurating the copper. It would be considered hazardous to use carbonates or oxyds of copper by themselves. The carbonates would quickly lose their carbonic acid, and being left as oxyds would, with the oxyds already present, become dissolved in the slags. But in a mixture of one-third carbonates and oxyds, with two-thirds yellow sulphurets, the sulphurets can be used with advantage without calcination.—The sulphurets are advanced in the reduction by the oxyds, and these are saved from the slags by the sulphurets, with which they form a reguline sulphuret, having no tendency to mix with the slags, and only occasionally getting into them in accidental small globules by unskilful manipulation. An advantage is found in using a considerable mixture of the Cornish and Irish yellow sulphurets, with the rich imported yellow sulphurets containing sixteen to twenty-five per cent. If the mixture holds too large a portion of the rich sulphurets, however, the regulus comes out with more sulphur in it than when less is used. The explanation probably is, that the poorer sulphurets holding more iron pyrites, which readily parts with its sulphur in the process of calcination, afford a larger portion of oxyd of iron, and that this re-acting upon the sulphur combined with the copper in the richer ores, produces a better regulus. Thus it is found that both the poor and the rich ores act with mutual advantage on one another in the process of smelting as carried on in Britain.

The great expense attendant upon the transport of copper ore to a distant smelting locality, naturally turns the attention of those whose minds are directed to the subject of mining it, to the aid to be derived in its reduction from such coal deposits as are most nearly situated in the region in which it exists. The geological structure of Canada appears to promise little in regard to this useful mineral, but in the States of the neighboring Union there are two localities on the great chain of lakes to which the mineral region of Lake Superior belongs, one at Cleveland on Lake Erie, the other at Chicago on Lake Michigan, within forty and sixty miles of which respectively, coal belonging to the great Appalachian deposit in the one instance, and the great Illinois deposit in the other, might probably be made available. But in the heart of the southern peninsula of Michigan, which is still nearer the metalliferous region, a third great coal field is spread out; and in this instance the waters of Lake Huron appear to make a deep incision into the deposit in Saginaw Bay. The coal seams have not, I believe, been yet touched upon the coast, but the band of limestone which immediately underlies the whole deposit, is known to come upon the bay, constituting some of its islands and points.—In other parts of its extension in the interior of the country, coal seams have been met with at no great distance above the band, and the great probability therefore, is, that they will occur either on the shore of the lake or a very short distance removed from it.

Saginaw Bay, therefore, appears to be the position naturally destined for the reduction of such copper ores as may result from the mineral region of Lake Superior. These ores, combined with the sulphurets reported to have been discovered on Lake Huron, seem to be sufficiently varied to give a favorable smelting mixture. The coal is of the bituminous description, and beds of fire-clay will be found supporting the seams. Unless some great change should be effected in the system of smelting copper ores, such as is reported in some of the respectable journals of the British Metropolis as likely to result from the recent discovery of a mode by which the aid of electricity is to be rendered available in the process, there is little doubt the produce of the Michigan mines will ultimately centre in this locality, and it can only be the operation of fiscal laws that will prevent the Canadian ores from finally reaching the same destination."

To render his Report more valuable and interesting to those who are already engaged in, or may be disposed to embark on mining speculations in the regions above described, Mr. Logan has appended a set of seven very useful tables, already alluded to, of which the three following are particularly worthy of attention. 1st.—A table showing the quantity of copper ores, British and Foreign, smelted in Britain,—the total quantity of fine copper, and total value, classed according to their respective sources,—with the average produce and the average sale price of the ores from each general source, for 8 years, from the 30th of June 1838 to the 30th of June 1846; 2nd,—A table showing the copper sold at public ticketings *in Cornwall*, with the total quantity, value, fine copper, average produce, and average price, for each mine for one year to the 31st of December 1845; and 3rd,—A similar table showing the copper ores sold at public ticketings *at Swansea in Wales*, with the quantity, value, fine copper, average produce, and average price, from each mine, Irish, Welsh, Foreign and Colonial, for one year to the 31st of December 1845.

In concluding this excusably very protracted article on the geology of Lake Superior, we cannot refrain from observing, that however much we might rejoice to see a *British* instead of an *American* canal leading past the rapids of St. Mary,* we are most happy to be able to congratulate our countrymen on the late rather unexpected manifestations that the mineral resources of the N. W. shores of *Lake Huron* may possibly out-rival, as they will certainly be far more accessible than those of the great "*Upper Lake*;" and we shall therefore continue to look hopefully forward to some successful experiments being yet achieved by which the recent discovery of a process whereby electricity can be made subservient to the smelting of ore, will ere long be made available in the immediate vicinity of the Huron or "*Bruce Mines*," and thereby overcome the only formidable obstacle to our Province embarking energetically and successfully in so extended and lucrative a branch of commerce, as taking the lead in the supply of so universally useful a metal as copper to the great and glorious Empire of which it forms so hopeful an integral part.

And thus, we bid our readers farewell; trusting that, while endeavouring to do justice to the labours of our respected Provincial Geologist, neither our humble endeavours to create a deeper general interest in objects of great public importance, nor our casual animadversions on the seeming indifference of our Government and Legislature to the proper scale and efficiency of the geological survey of the Province,—*as a creditable national undertaking*,—will prove altogether in vain. At all events, we are conscious of no other motive than the hope of doing good; and we have, therefore, never hesitated to obey the same straightforward impulse that animated the ancient Roman satirist—

Verba animi proferre, et vitam imponere vero.

Postscript.—Since the above was in type, we have been agreeably surprised by the appearance of the interesting and satisfactory Report of the Quebec and Lake Superior Mining Association; and find the following extract accord so thoroughly with our own feelings and opinions, that we have been encouraged to present it to our readers, as well deserving of particular attention:—

The prospect of a canal round the rapids is still remote. The action taken by the Legislature of the State of Michigan, in relation thereto, has been suddenly arrested, by the intervention of the military authorities. The measure can now only be prosecuted under the sanction of an Act of the General Government; and the Directors have reason to believe that the subject will be brought before Congress, at its next Session, this canal being one of those improvements contemplated by the great convention of Chicago, in July last.

* The formation of a canal on the American side of the Sault St. Marie has already been brought before Congress, and the expense estimated a £100,000. But whatever it may prove it is certain that a canal on the British side would cost one third less.

There is at present no prospect of a canal being constructed on the British side, which is much to be deplored, when the small cost (£60,000) is considered, the distance from the water at one end to the water on the other, being only 638 yards, and the difference of level only 18½ feet, which two locks would surmount.

The Directors have ascertained that a Railroad could be constructed at an expense of £2,500, including the wharves at each end, to be carried into 8½ feet water; and conceiving the Railroad would to a certain extent remove the difficulties in transporting the ore and supplies across the portage, they would cheerfully unite with other companies in forming such a work: but until a canal is constructed to allow the passage of vessels drawing 8½ feet water, the prosperity of the mining interests on Lake Superior will be seriously retarded.

The construction of this canal is deserving of the serious consideration of the Government,—the copper trade of the British side of Lake Superior under the management of competent superintendents, appearing from developments actually made, to be destined at an earlier period than may be supposed to exceed in amount that of any other branch of Canadian commerce.

Another impediment to the mining interests on Lake Superior is the Flats on Lake George, about 20 miles below the rapids of Sault Ste. Marie, on which for a distance of about 250 feet, there is barely 6 feet water. Loaded vessels must here discharge so much of their cargoes into scows or other small craft, as will lighten them sufficiently to allow them to pass the Flats, when they must re-load. The expense and delay caused by this transhipment, particularly with copper ore in bulk, must, as may be supposed, be very great. The accumulation of sand or mud of which these flats are composed, is supposed to be caused by the remains of old scows or batteaux sunk at that place, all which, however, could be removed at a comparatively trifling expense.

A canal across the portage, and deepening the Flats on Lake George to 8½ feet, would enable a vessel carrying 500 tons of ore to proceed from the mines on Lake Superior direct to Quebec, without transhipment of any portion of her cargo, and there to discharge it into a sea-going vessel, to be transported to Swansea, which might be accomplished at an expense for the whole distance of about £2 10s. to £2 15s. per ton; thus enabling the Lake Superior Mines to compete with any out of England.

L.

Annual Report of the Medical Superintendant of the Temporary Provincial Lunatic Asylum, at Toronto, from April 1, 1846, to March 31, 1847. Toronto, 1847.

On the first of April, 1846, there remained in the institution:

	M.	F.	Total.
	55	36	91
Admitted for 1st time during year	66	44	110
Re-admitted during year	10	3	13
	76	47	123
Total treated during the year	131	83	214
Discharged—Recovered	37	14	51
Improved	3	3	6
Unimproved	5	3	8
Escaped	5	1	6
Died	10	1	11
	60	22	82
Remaining, March 31, 1847,	71	61	132

Of the deaths, we are informed that four occurred from pulmonary consumption; two from exhaustion; two from epilepsy; and one from scarlatina maligna. Another died from delirium tremens in six hours, and a second from phthisis three days, after admission.

The following table exhibits the forms of disease of those admitted:

	M.	F.	Total.
Mania	35	26	61
Melancholia	17	11	28
Monomania	—	2	2
Dementia	3	3	6
Idiocy	—	2	2
Delirium Tremens	4	—	4
Epilepsy	6	1	7

As regards occupation, those engaged in "*house work*" appeared to have been most incident to mental affections, no less than thirty-four having been that way occupied; next rank labourers, and next farmers, not less than sixty-four out of the total admissions being comprised under these three heads.

As regards the districts whence the patients were brought, it appears that the Home district furnished sixty-one—more than one half the whole number—and that the Gore district furnished seventeen.

The institution appears to be ably managed by Dr. Telfer, its medical superintendent. May we not now with reason inquire into the management of the sister institution at Beauport. We should much like to see a report from it.

PRACTICE OF MEDICINE AND PATHOLOGY.

Report of Committee on Typhus, Typhoid, or Ship Fever, under the Resolution of Dr. F. Campbell Stewart, passed at the Meeting in June last.—New York, July 7, 1847.—The Committee appointed at the last meeting of the Academy to investigate the subject of the prevailing Typhus, Typhoid, or Ship Fever, respectfully

REPORT:

That in accordance with their instructions, they have visited and inspected all the public Hospitals and private institutions of the city, into which fever cases have been received, and the result of their investigations has been so far satisfactory as to have enabled them to obtain a vast amount of valuable, general and statistical information, in regard to the subject on which they are required to report; which will place it in their power, at some future period, when sufficient time shall have been allowed to collect and arrange all the data upon which their report will be based—to present, what they conceive will be an interesting and valuable record of medical experience, in regard,

1st. To the origin, causes, and mode of propagation of the fever of the present season.

2d. To its distinctive characters.

3d. To its autopsic phenomena.

4th. To its statistics, and,

5th. To the course of treatment which has been attended with the most satisfactory results.

Sub-Committees have been appointed to examine into each of these departments of the general subject, and a correspondence has been opened with the health officers of various seaports on our continent at which the disease is prevailing.

As considerable time must elapse, however, before all the expected returns can be received, and a final and satisfactory report rendered, your Committee have deemed it expe-

dient, in view of the state of public alarm in regard to this fever, to submit to you at the present time, some few general facts and conclusions in connection with the subject, which if allowed to go forth with the sanction and approval of the Academy, will be calculated to remove from the public mind all fear in relation to the danger to be apprehended.

That there has been, during the past three months, an unusual number of cases of Typhus, or ship Fever in our public and private hospitals, is undoubtedly true : it has been confined, however, almost entirely to emigrants, and particularly to those arriving from Ireland, to whose unhappy condition at home, and the criminal negligence of those engaged in transporting them to our shores, may be attributed the vast amount of suffering and sickness to which they have been subjected.

The records of the Commissioners of Health show that no less number of steerage, or emigrant passengers, than 84,218 arrived at this port during the first six months of the present year : and of these, 74,528 have been landed since the first of April, giving a monthly average, since the latter date, of nearly 25,000.

This immense increase of emigration is alone sufficient to account for a large increase in the number of cases of a disease which always prevails with us at the period of the year when emigrants are arriving. In addition to this, however, other causes, already alluded to, have had a material influence in causing the sickness of the present season. It is now a well-established fact, that Typhus, Ship, or Jail Fever, is capable of being produced at any time when a large number of persons are congregated together in a confined space, and deprived of the means of cleanliness, pure air, and proper nourishment ; and as most of these causes have existed to an unparalleled extent in the case of emigrants of the present season, it is rather a matter of surprise that so small a number, comparatively speaking, should have suffered from it.

In the case of the Irish paupers introduced among us, all these causes have been in full operation. Previous to embarkation, they had been for a long period in a state of destitution, but little short of actual starvation. They have been taken on board ship in a filthy condition, and in most cases were unprovided with a single change of clothing.

Numbers of them—to the extent of more than 500—have been received into the steerage of one vessel, and their condition at sea has sometimes been most deplorable. In a British vessel (the ship Ceylon), which your Committee were, through the politeness of the Health Officer, and his deputy, Dr. Harcourt, enabled to visit and inspect on her arrival, we found 259 passengers huddled together in the steerage, which was in a most foul state.

This vessel had lost as many as thirty of her passengers previous to her arrival, and 115 were then so ill as to render it necessary to land them at Quarantine Hospital At other ports on this continent, vessels have arrived in a still worse condition. The ship Loosthauk, from Liverpool to Quebec, had to put into Chatham in distress. She had, on leaving England, 349 steerage passengers, of whom 117 had died on the passage, and only fifty persons on board had escaped sickness. Five emigrant vessels arrived at Quebec about the middle of the last month, which had lost at sea no less than 275 of their passengers—an average of fifty-five for each one of them.

The returns made to our Health Office at Staten Island by captains of vessels arriving here, show an aggregate of 947 deaths at sea, on board of vessels coming from European ports ; and three-fourths of the number admitted into the Quarantine Hospital (most of them Irish) have been taken from British vessels.

These facts prove conclusively what is the cause to which we are to attribute the increase of Ship Fever during the present season.

Notwithstanding this great increase, however, we think that no danger need be apprehended by our citizens. But few of the causes productive of the disease exist among us, and no apprehension need be felt of its becoming epidemic, so long as due attention is paid to cleanliness and ventilation. The disease has been *exclusively* confined to emigrants and those in constant attendance upon them, such as physicians, medical students, and nurses. We have been unable to collect the particulars of more than two or three cases which could not be traced directly to intercourse with those labouring under the disease, and who had lately arrived from sea. Although hundreds of cases have been congregated in our public and private Hospitals, no person living in their vicinity has been attacked—none have suffered but those who, as has been already stated, are in constant intercourse with, and daily attendance upon, the sick. The bills of mortality, too, show that the disease has been confined almost entirely to the hospitals.

From the City Inspector's returns we gather that the whole number of deaths in the city from Typhoid and Typhus (Ship) Fever, was, from January 2d to June 26th, inclusive, 570

Of these there died :

At the Bellevue Hospital	260
" Children's Hospital, Blackwell's Island	10
" Penitentiary Hospital, do .	6
" City Hospital	62
" Private Hospitals at Bloomingdale and Harlaem (whole mortality 201, of which, as these hospitals are for sick emigrants *exclusively*, it is fair to presume the greater part were of ship fever), say two-thirds, or	134
Total deaths in hospitals	480
Leaving for all other public institutions, and the city generally, only	90
Total	570

This is a mortality so trifling, when it is borne in mind that it occurs in a population of more than 400,000, and embraces a period of over six months, that it affords no ground whatever for apprehension.

In addition to all this, moreover, ample provision has now been made by the Commissioners of Emigration to provide for the accommodation of sick emigrants without the city precincts.

From the foregoing facts, and other information in their possession, your Committee feel themselves fully justified in presenting for your consideration and adoption the following conclusions :

1st. That, although there has been a decided increase in the number of cases of Typhus, or Ship Fever, in our city during the present season, as compared with other seasons, such increase is only in proportion to the increased emigration of the present year, and the bad condition of the emigrants.

2d. That the disease is confined almost exclusively to emigrants and those who are in direct and constant attendance upon such of them as are sick.

3d. That no danger need be apprehended of the disease becoming epidemic ; and that, with a due regard to cleanliness and ventilation, our citizens have no cause whatever for alarm on the subject.

All of which is respectfully submitted.

[Signed] F. Campbell Stewart, M. D.
F. U. Johnston, M. D.
Isaac Wood, M. D.
Joseph M. Smith, M. D.
H. Van Hoovenbergh, M. D.
John H. Griscom, M. D.
Cyrus Weeks, M. D.
Gustavus A. Sabine, M. D.
James Manley, M. D., *Committee.*

Peritonitis from Fecal Matter in the Appendix Vermiformis.—The history of the case is briefly as follows:—For a fortnight previous to the attack, Mr. L. M. S. had been troubled with uncomfortable feelings in his bowels, slight pains, and frequent nausea. These feelings he attributed to some cucumbers he ate about the time he began to feel more unwell. For three days previous to the attack, he had eaten sparingly of light diet, except on Wednesday, the day before he was taken sick, when he took for his dinner what is usually called a "boiled dish," eating sparingly of meat, but rather freely of vegetables. On the following day, Thursday, July 22, while engaged in his usual avocations, at which he had continued up to the time of his seizure, he was attacked with severe pains in his bowels, and nausea, at noon. He was obliged to leave his business and return home, The pain was in the right hypogastric region—not constant. but intermitting, like colic pain. There was no tenderness of the bowels on pressure, and the pulse was nearly natural. He had not had a movement of the bowels for forty-eight hours. He took a cathartic, which was retained on the stomach three hours and a half, and then was vomited, without having any effect on the bowels. An enema was then ordered, which moved the bowels freely, with much relief. In two or three hours after the enema, the spasmatic pain returned in the same spot on the right side, shooting through to the back. As the bowels had been very thoroughly evacuated by senna and salts on Tuesday morning previous, and the enema having operated so effectually, resort was had to opiates and external applications to the bowels. These relieved him till Friday morning. We were obliged to resort to opiates every few hours during the day on Friday, to relieve pain—the pain continuing in the same spot. Through the whole day there was no tenderness of the bowels, except at the seat of pain, in the right iliac region. Bowels but little swollen; pulse 100, compressible, moderately full.

Saturday morning.—Pulse more frequent (120) and smaller. Skin moist, not clammy—temperature a little diminished; countenance bad; bowels swollen; pain and tenderness confined to the right side, as before. He continued very much in this state during the day, requiring but few remedies to keep him free from pain. A consultation was had with Dr. J. Ware. He had more injections, but with no material benefit.

Sunday morning.—His pains during the night had been very excruciating, yet he slept but little, except short naps. He cannot turn upon his right side without bringing on severe cutting pain in that side, in the spot to which all his pain has been referred. It has been so with him since Thursday afternoon. He vomited frequently, towards morning, dark mucus and such drinks as he had taken during the night, coloured by particles of dark blood. Pulse more rapid and less distinct. Skin more moist and cool. About 9 o'clock, A.M., some re-action came on. Bowels less swollen than yesterday—appeared more comfortable. This continued through the forenoon. In the afternoon he fell off again, complained of pain in other parts of his bowels, and continued to fail, with much suffering, till 11 o'clock, Sunday night, when he calmly breathed his last.

On Monday an autopsy was made by Dr. J. B. S. Jackson, of Boston, Dr. J. B. Taylor and myself. We found extensive peritoneal inflammation; effusion of lymph and serum. The most severe inflammation was in the region to which the pain was chiefly confined. The cæcum and ileum were highly inflamed, but the cause of the inflammation was not discovered till the cæcum was dissected from its bed in the iliac fossa. We searched in vain for the appendix vermiformis till the cæcum was raised. We then found the appendix closely adherent to the cæcum, in an ulcerated and gangrenous condition. It was turned under the cæcum, and extended upwards on the posterior part of the cæcum, making a bed for itself on the psoas muscle. Within the appendix we found two small masses of fecal matter, in a hardened condition. One was about half an inch in length, the size of a large pipe stem; the other the size of a large pea. These had passed some distance into the appendix, and the largest of which had gone in the greatest distance, and had ulcerated completely through the coats of the appendix; one extremity of it projecting through the peritoneal covering—but had not yet escaped entirely from the appendix. The canal between the fecal matter and the opening from the cæcum into the appendix was closed by inflammation, so that a probe could not be passed from the cæcum up to the fecal matter in the appendix without some force.

How long the appendix had been in this unnatural condition, it is impossible to say. It was probably of long standing, but not congenital. He had for the last three or four days complained of pain and lameness in that region when more than usually fatigued. And of the length of time the fecal matter had been retained, no definite opinion can be given.—A. H.—*Communicated for the Boston Medical and Surgical Journal.*

On the Effects of Large Doses of Sulphate of Quinine.—By William Thom, M. D., of Eastville, Northampton County, Virginia.—In these days of ultraism and exclusiveness in medical matters, I have thought it might not be amiss to report the following cases, illustrative of some of the effects of very large and frequently repeated doses of quinine. I regret that the imperfect notes of the cases preserved will permit my giving little more than an outline of the symptoms and treatment; enough, however, remains to show that the quinine was the direct cause of the unpleasant symptoms occurring at the conclusion of the treatment: and although all the cases ultimately did well, they still warn us of the dangers attending the indiscriminate administration of this most valuable but much abused agent. All the cases occurred in the course of the past fall, and three out of four in children of from six to eight years of age, and all were ill with some modification of miasmatic fever, assuming the ordinary remittent or congestive form distinguishing our autumnal diseases. The fourth case will be found to furnish another instance of amaurosis produced by quinine, and affords additional evidence of the correctness of Dr. M'Lean's opinion on this subject, as expressed in an article transferred to the Record of the *Examiner* for February of this year. This was the first case of the kind which had ever come under my observation, in which the effect so immediately followed the administration of the remedy; and I was somewhat at a loss whether to ascribe it to this or not. Dr. M'Lean's paper, however, has satisfied me on this point.

The phenomena presented by all the cases are explicable only on the idea that quinine exerts a powerfully sedative action on the nervous system. The symptoms manifested (though in a less degree) were not like those exhibited by some constitutions under the peculiar action of mercury, and described by Mr. Pearson as *mercurial eretism*. Smaller doses of the medicine had, in all cases, been tried in vain, and I am satisfied that nothing but very large and frequently repeated doses could have saved the lives of two of them. It will be seen, however, that in most of the cases the quantity of quinine taken was inordinately great.

Case 1.—A little girl, ætat. 7, with remittent of the ordinary form, exacerbation occurring daily about noon. When I saw her, the remission had just begun; I ordered two grains of quinine in solution every hour until she had taken twelve grains; afterwards a cathartic of sulphate of potassa and rhubarb. The next day her fever recurred at the usual time as high as ever.

℞ Hydrarg. chlor. mit. gr. vj., pulv. ipecac., gr. iij. M. Div. in chart. 6—S., one every two hours, and afterwards, as the paroxysm was expected in four hours,

to take five grains of quinine, and repeat it in an hour.

She took ten grains; fever rose as usual. At the next remission I ordered her to have sixteen grains of quinine at two doses, with an interval of two hours. When the next paroxysm was expected, I found my patient free from fever, but with a quick, rather weak and thready pulse; mind slow; tongue tremulous; skin cool and moist. All these symptoms subsided entirely in less than twenty-four hours, and she has never had a fever since.

Case 2.—Negro boy, ætat. 6 or 7, ill with remittent fever with powerful determination to the brain, accompanied by a high grade of arterial excitement. I bled him, and ordered a solution of nitrate of potassa and tartar emetic, as he had been purged previously to my seeing him. An indistinct remission occurred for a short time every morning; as soon as this came on ordered three grains of quinine every hour. He took only six grains when an exacerbation of fever took place, with congestion of liver and stomach.

℞ Hydrarg, chlor. mit. gr. viii., pulv. ipecac., gr. iv.—M. Div. in chart. 4.—S., one every two hours.

He took all the powders, which acted gently on the bowels, and produced a more perfect remission. Ordered five grains each of quinine and rhubarb, and repeat it in an hour. Soon after the last dose was exhibited, reaction again came on violently, attended with great heat of the skin, thirst, dry tongue, and pulse somewhat tense and irritable but with little force or fulness. By the use of febrifuge medicines this condition yielded to a partial remission, and I ordered eight grains of quinine, to be repeated in an hour. At my next visit I found my patient without fever, with a cool and moist skin, small, quick and thready pulse, tremulous tongue, and rather turpid intellect. These symptoms soon subsided, and he had a rapid convalescence.

Case 3.—Attended Mrs. M., ætat. about 35, in consultation with the late Dr. Ker; had been sick about ten days with an obstinate, but not very violent attack of remittent fever; she had been previously taking quinine in small doses, been purged, blistered, taken mercury, &c. We ordered quinine in ten-grain doses, at intervals of two hours; she took twenty grains when her fever rose, having previously to this complained of noises in her ears, &c., from the use of the medicine. During the next remission she took thirty grains of quinine in three doses. That night we found our patient exhibiting such smyptoms of prostration as obliged us to use strong stimulants for her relief. Her pulse was small, thready, and weak, skin cool and clammy, much nausea, and mind torpid. After these were relieved, she began to recover slowly, though for some days she had occasional returns of fever.

Case 4.—Attended George, about 8 years old, in consultation with Dr. Bagwell of this county. The case was a very severe remittent fever, accompanied by violent congestion of the stomach. He had been previously purged, blistered, &c., and as soon as a partial remission occurred we recommenced giving quinine in five-grain doses, repeated every two hours. This was continued during two remissions without any appreciable effect, when Dr. B., who remained with the patient, increased the dose and shortened the interval. The quantity taken in three days is not accurately known, but I should think was not much less than two scruples. As soon as the constitutional effects of the medicine were induced, the disease yielded; but dilatation of the pupil, insensibility to light, and almost total loss of vision followed. The amaurotic condition slowly improved without remedies, and he is now perfectly restored.

I am informed by a physician of this place, that a case similar to some of the above occurred in his family in the course of last fall. A young lady was so prostrated by taking about twenty grains of quinine in two doses, as to require artificial heat to the surface and strong stimulants to restore her. The symptoms were similar to those of the three first cases recorded above.—*Phil. Med. Examiner.*

Practical Observations on Ship Fever as it prevailed in Philadelphia and its environs, in the months of June, July, and August, 1847. By Laurence Turnbull, M. D.

This disease prevails at the present time to some extent as an epidemic in our city and suburbs. During the last three months, there have been over three hundred cases admitted into the Almshouse, and a corresponding number under the care of physicians resident in the city. Having had a number of cases in charge, I have taken this method of making known my views of its nature and treatment, hoping my endeavours may add something to the general stock of knowledge concerning it.

The first great cause of this fever may be traced to the starving state of the population of Ireland; with the subsequent crowded condition of our immigrant ships, without a proper attention to cleanliness and ventilation on the part of their commanders; thus causing the generation of an animal effluvium, which, contaminating the surrounding atmosphere, is received into the lungs, thence proceeding into the circulation. The extreme series of organic capillaries being thus irritated, occasions a subversion of the existing mode of action, through which the different secretions and functions are diminished, increased, or modified.

This disease attacks all ages, from the infant to the old man, and not the poor immigrant only, but the residents of our city, passing by means of this contagious effluvium into the lungs of all constantly exposed to its baneful influence. There cannot be a doubt concerning its contagious nature, as nine of the most severe cases out of twenty-one, in my own practice, were those residing in the same houses with the sick, none of them having been on board ship, but citizens for some time.

The period which elapses before the disease shows itself averages from one to two weeks, but in most cases it makes its appearance in a few days after leaving the vessel.

Nearly every ship which enters our port brings a greater or less number of invalids, some having suffered for twenty-six and twenty-eight days, without proper nourishment or medical attendance. In many instances, the number of passengers in the Liverpool packets to New York, has exceeded five hundred, and the regulations of those ships obliged them to leave their berths between the hours of three and four, A. M., for the purpose of cleansing them, so much water being used in this process as to leave them in a damp and unhealthy condition for many hours. The water for culinary purposes was not distributed until nine, so that the strong and active alone procured a meal before twelve or one, P. M. To insure personal cleanliness for those who were not so disposed, a barrel of water was provided and a portion of it poured over the poor creatures, who were not even fortified by proper food. It cannot therefore be a matter of astonishment that a number should be sick on the voyage, and a still larger number fit only for the hospital on their arrival, having had within the vessel all the elements to generate typhus fever. First, their crowded condition; secondly, their want of proper rest; thirdly, the want of proper nourishment; and fourthly, the damp condition of their sleeping and eating apartments.

The authorities now remove the sick either into the Lazaretto or the fever hospital at Bush Hill, which was opened for the reception of patients on the ninth of July, under the charge of Drs. L. W. Knight, and William Ashley; one hundred and eighty cases having been admitted from that time up to the eighteenth of August. Of that number thirteen have died, thirty have been discharged cured, and one hundred and thirty-seven remain under treatment.

Of the thirteen cases which terminated fatally, three were

in a dying state when admitted, and three died of purpura hæmorrhagica, marasmus and phthisis pulmonalis, thus considerably reducing the number of deaths by fever, and showing that the motality is small in comparison with the accounts received from Canada and New York.

The situation of the hospital is very favourable, being light, dry, and well ventilated. The only objection is the want of space, obliging them to crowd the wards, so that dysentery or diarrhæ occurring as a complication, it is apt to assume a malignant form.

The premonitory symptoms are as follows:—Slight chill, skin hot and dry, nausea, and in some cases vomiting, muscular pains in the back and limbs, with intense pain in the frontal region, increasing from the first to the sixth day. Tongue of a whitish colour over the surface, tip of bright red: pulse averaging from eighty-six to one hundred and twenty, with bowels costive

These symptoms continue for several days, when the skin becomes of a dusky red, the eyes are injected, tongue covered with a thick yellowish, brown, or black paste; teeth covered with sordes; acute pain over the epigastric region. with skin covered with a petechial eruption coming out from the sixth to the tenth day. Delirium now supervenes, with congestion of the lungs, brain or bronchial tubes, generally accompanied by deafness, spasmodic twitchings of the muscles, and in some cases dysentery and profuse sweats, not of a critical nature.

These symptoms either increase or diminish towards the thirteenth or fourteenth day, or may terminate in death from the twentieth to the thirtieth day. the liability to relapse being very great in all cases.

I have found the following symptoms favourable when occurring about the fourteenth or twenty-first day: tongue becoming moist, first at edges; slight salivation; pulse fuller and slower, with tongue not tremulous when protruded. Unfavourable symptoms: great muscular debility; decubitus, or gliding down to the bottom of the bed, picking at the clothes, or catching at imaginary objects.

Treatment.—In the first stage a gentle aperient of oleum ricini or mild neutral salt. Second stage; to diminish the fever by freely sponging the body with tepid water, with the free use of ice or neutral mixture. Thirdly; to subdue local inflammation by cups or leeches, and by applying cold by means of ice to the head, or blister to the nape of the neck, with small doses of hydrargyrum cum cretâ and pulvis rhei. Lastly; to give quinæ sulphas in pills of one grain three times a day, with from f℥iv. to f℥vi. of port wine.

By following the above course of treatment, bearing in mind ventilation and cleanliness, with a simple farinaceous diet, out of twenty-one cases I have lost but two, and regretted much that in both instances there was no opportunity for a post-mortem examination.—*Medical Examiner.*

SURGERY.

Simple Treatment of Prolapsus Ani. By Dr. Hake.—Take a piece of sponge four or five inches long, an inch and a half wide, and half an inch thick—the more elastic a bit you can find the better; roll this, in a damp but not wet state, pretty tightly, so that the roll, if relaxed, would be ready to spring back into its full length, and it will then make a roll of some little substance, round, but still soft: and its length, when thus rolled, will of course be an inch and a half. Apply it then lengthwise to the anus, so that it may be pressed, about the centre of it, quite home and firmly to that part. Taking care that it may remain so, stretch a length of adhesive plaster, about fourteen inches long, and three and a half wide, more or less, straight across the nates, rather low down, and contrive so that while the plaster adheres on one side, you press the other side closer to its opposite before you fix the length finally where it is to remain. Then sit down, at first gently upon it, and it will become very firm and fast as long as the plaster is good. I need not say that these two pressures constantly going on do he work capitally, and without any inconvenience worth peaking of—I mean, the two pressures of the roll of sponge always striving to unwrap itself, and the cross-band of adhesive plaster always keeping it from doing so by holding the nates sufficiently close together to hinder it. The working is really perfect when a little use and management has got a person into the way of it. But to facilitate matters, I will set down a few observations, at the risk of being tedious and more particular than I need be.

I never put this on until that time of day when I am going to be standing about, or to take exercise, whether walking, riding, or driving; but it should be put on then for all of these. In the evening, I take off the plaster, but leave the sponge in its place, where it has got by that time so firmly fixed by gradual spreading and swelling, that there is no danger that anything short of a great exertion will loosen it, and it is of course more comfortable to do without the plaster when it is not wanted. The sponge should be washed in cold water every time it is taken off, and in cold weather the plaster should just cross the fire before it is put on; in moderately warm weather it will adhere of itself, especially if it is sat upon for half a minute. The same plaster is better the second day than even the first, and will do very well the third day—this where economy is an object.

Wash the parts where the plaster goes every morning, or oftener, with cold water, or water, or water and vinegar, wash them well, and the skin will never suffer.

If the plaster leaves something sickly behind it when it is taken off, rub it with a very little spirit of wine, and the towel will remove it.

If there be an irritation about the anus, or gut that comes down, wash it with vinegar and water, and the relief will be wonderful, and that part of the evil soon cured. This wash cannot be too much praised for this purpose, for piles, and for the like. I leave it for you to say whether something might not be dropped upon the sponge, or the sponge dipped in something which would promote a complete cure. What I said is perfectly cleanly, secures exercise and comfort, and very gradually, I believe, tends to set things right again.

The relief is, indeed, so perfect, and it is relief from such suffering, that, without a bit of braggadocio, I do think no sufferer from such malady would feel that he could be grateful enough for being brought acquainted with the treatment I have described, though its perfect management will require a little experience at least, and perhaps some advice at first. —*Medical Examiner.*

Removal of the Parotid Gland, by Professor Pancoast. Reported by Ellerslie Wallace, M.D., Demonstrator of Anatomy in Jefferson Medical College.—The patient was a Mrs. Twining, from Newport, Bucks county, Pennsylvania, a woman of 60 years of age. According to her statement and that of her friends, the disease commenced upwards of ten years ago as a swelling of the gland, of an acute character, simulating ordinary parotitis. After the acute symptoms had passed away, the gland did not return to its normal size, but remained a little enlarged for a few years. It then began to increase in size, and she applied to Dr. Smith, of Newport, who informed her that it was an enlargement of the parotid gland, for which he did not at the time advise any operation. Its growth increasing more rapidly within the last year, and its increase of growth being accompanied by much distress from severe shooting pains about the face and forehead, she came to Philadelphia to seek surgical aid;

and, consulting Dr. Pancoast, gladly consented to an operation in hope of a cure.

The tumour was on the right side of the face, modulated and irregular in its external aspect, and appearing about half the size of a man's fist. It extended from a little above the zygoma, to a short space below the angle of the jaw—passing forward over the greater part of the masseter muscle, and backward under the ear, so as to elevate and press posteriorly the anterior border of the ear; it likewise nearly surrounded the auditory meatus, and also overlapped the insertion of the sterno-cleido-mastoid. When grasped firmly, it was found but slightly moveable, deeply fixed, and firm in its texture, except at its upper part, where there seemed a local point of softening.

None of the surrounding lymphatic glands seemed at all involved. The complexion of the patient was somewhat straw coloured, though she appeared vigorous for her age.

Operation.—The patient was placed on her left side, with the head and shoulders elevated, and her head well turned towards the left shoulder. The tumour was exposed by a single incision shaped somewhat like the Italic *f* reversed: it was commenced above the top of the ear, and carried forward and downward to near the centre of the tumour, then in a direction sloping slightly backwards to just below the lobe of the ear, when it was again directed forward, downward and nearly vertically, leaving a concavity in front, and terminating about an inch and a half below the base of the jaw, and somewhat within the inner edge of the sterno-mastoid. The dissection was then commenced by reverting the flaps so as to expose the tumour, and continued by separating the diseased mass first above, then posteriorly, next anteriorly, and lastly below. Some vessels bled from the surface of the tumour, as well as some small arterial branches from the flap, but by pressure of the fingers and the application of a few ligatures, all material hemorrhage was arrested.

Dr. Pancoast now sought for the external carotid artery, with a view of placing a ligature upon it, near its entrance into the tumour; this required a slight increase in length of the first incision, as from the size and attachments of the tumour, it was somewhat difficult to reach the vessel. It was isolated, however, with its vena comes, and the two were raised on the director, and a Physick's aneurismal needle armed with a ligature passed under them, along the groove in the director, and both secured in the loop. From this moment to near the conclusion of the operation, there was very trifling hemorrhage. The vessels were now cut beyond the ligature, and while strong traction was made upon the tumour, Dr. P. detached it from its connexions to a still greater distance below. The patient complained much of the pain caused by the upward traction. The tumour was next loosened to a greater extent above, as well as posteriorly and anteriorly.

The central part of the tumour, deeply seated, was the last part detached; and a strong jet of blood, by retrogression from the internal maxillary artery as the final cuts were made, required that a ligature should be applied to the divided vessel. This ligature, with two on smaller bleeding vessels, and the one on the carotid artery, were all that were left at the conclusion of the operation.

A small piece of diseased structure being discovered after the thorough cleansing of the wound, near the bottom of the cavity, it was removed by the handle and blade of the scalpel. As far as was possible, the handle of the scalpel was used during the operation, but for the most part the attachments were so firm as to require the cutting edge. The constant firm traction directed by Dr. Pancoast, was of much value in facilitating and in hastening the extirpation of the diseased mass.

The depth of the wound was very great, as well as its extent. It was six inches in length, exposing the greater part of the masseter muscle, a part of which, being adherent to, was removed with the tumour, and a small portion of the buccinator was also laid bare. The under surface of the internal pterygoid was exposed, as well as the entire ramus of the jaw posterior to the masseter muscle; the ligaments of the temporo-maxillary articulation were also laid bare, on their outer, lower and inner surface, and the condyle could be seen sliding forward in its socket when the mouth was opened. The finger being placed on the styloid process of the temporal bone, (which was exposed in its whole length,) and carried downward, the contraction of the styloid muscles could be distinctly felt. A part of one of the styloid muscles, which was embraced by the tumour, was removed with it. The insertion of the sterno-cleido-mastoid into the mastoid process was also plainly shown. There was paralysis of the side of the face and of the orbicularis oculi, induced by the division of the portio dura—this nerve having been removed with the diseased structure. The lips of the wound were approximated by suture, and pressed down into the deep cavity by a compress of lint spread with cerate; another compress was laid over the entire length of the incision, and strips of adhesive plaster applied to keep the sides of the cavity in contact. The patient was a good deal exhausted at the close of the dressing, and took about ℥j. wine in some water; reaction soon came on, and she pronounced herself comfortable.

Dr. Pancoast invited me to visit the case after the operation, and upon no occasion has there been any unpleasant symptom, either constitutional or local. Her appetite has been good, she has rested well, had no fever, nor local pain nor soreness enough to induce any complaint. We examined the wound on the fifth day after the operation, and the upper and lower part, for three-fourths of an inch, had united by first intention, and so favourable was its appearance, that the centre, where the first compress had been placed, was not disturbed. On the tenth day the first entire dressing was made, and on the twelfth, the second. There had been no discharge of matter, except a little that hardened on the ligatures, and there was scarcely any odour from the wound. Union by first intention has been complete—closely embracing the ligatures, the integuments being sunk down in the deep fossa left by the removal of the diseased gland.

Since the fifth day from the operation, the patient has dressed and sat up daily.—*Medical Examiner, July*, 1847.

MIDWIFERY.

The Blood in Puerperal Fever.—The condition of the blood in this disease has been made the subject of an inaugural dissertation by M. Hersent. The following are the conclusions at which he has arrived:

1st. The amount of water is very much increased; there is from the first a considerable diminution of blood-corpuscles; and, finally, there is a great diminution in the amount of albumen.

2d. The violence of the puerperal affection is proportioned to the degree of alteration of the blood.

3d. The fibrin is usually not below, and sometimes above, the normal standard, and hence the blood generally coagulates pretty firmly.

4th. The alteration in the blood probably precedes the development of the disease."—*Dr. Day's Report on Chemistry*, 1847.

Hysteria.—The following conclusions respecting the pathology and treatment of hysteria, appear in a memoir offered by M. Gendrin (Archives, Gén., Sept., 1846), to the Académie de Medicine:

1st. Hysteria is not universally characterized by convulsive paroxysms: it is a *continuous* malady, the symptoms of which are always to be recognized during the interval between the paroxysms, as well as in the fit.

2d. In all cases of hysteria, without exception, a general or

partial anæsthesia exists. In the slighter degress, the anæsthessi occupies only particular parts of the integuments; in the more aggravated forms the whole integument is implicated, as are also such portions of the mucous membranes as are amenable to examination.

3d. There is no accordance between the degree of anæsthesia and the severity of the hysteric paroxysm.

4th. The greater number of patients experience over a limited part of the body a degree of hyperæsthesia which is in many cases the immediate cause of the fit.

5th. Paralysis is a frequent hysterical symptom, and may be prolonged for an indefinite time. This paralysis is the source of many serious errors in diagnosis.

6th. It is a mistake to consider the sensation of a ball in the throat as a constant accompaniment of hysteria.

7th. All the marvels related of late days as the production of animal magnetism are witnessed in spontaneous hysteria: so the insensibility which will allow a painful operation to be performed may be seen in hysteria.

8th. Of all medicinal agents there are none which is so efficacious as opium in large doses.—*Ranking's Abstract.*

MATERIA MEDICA AND CHEMISTRY.

Means of Recognising the presence of Morphia in Cases of Poisoning by that Substance.—This method is detailed in the Gazette Médicale, as proposed by M. Mermu. The solid matters ejected from the stomach are first to be washed with water, slightly acidulated with acetic acid. The product of the several washings is to be mixed with any liquids which can be collected. If one has liquids only at his disposal, those are to be mixed with the water, acidulated as above. In either case, the resulting mixture is then to be evaporated to dryness, and treated with boiling alcohol, to separate the animal matters. To the alcoholic liquid, previously filtered, some tincture of gall-nuts is to be added—the tincture being made of 125 parts of alcohol with 250 parts of coarsely powdered gall-nuts; and the whole to be let digest fifteen days, which will precipitate the little animal matter dissolved by the alcohol, and the combination of tannin and morphia thence resulting will remain in solution.

The liquid is next to be filtered, mixed with a small quantity of distilled water, and then a solution of gelatine to be added in excess, in order to decompose the tannate of morphia. The morphia having gone over to the gelatine, the tannin with which it was previously in combination becomes dissolved by the spirit. To separate the precipitate of tannin and gelatine, it is necessary again to filter; and when the alcohol is evaporated, the morphia will be left, which may be recognised by its particular tests.—*London Lancet.*

Separation of Alumina from Sesquioxide of Iron.—The alumina, as usually separated from oxide of iron by digestion with a solution of potassa, is seldom pure. According to the observations of Malagnti, Durocher, and Knop, the best method of precipitating and separating these oxides, is to add to the solution sulphuret of ammonium. The precipitate must be washed with water containing a little of the sulphuret, and the alumina extracted by a solution of potassa, to which a few drops of sulphuret of ammonium have been added. In ordinary analyses, the mixed oxides may be digested with solution of potassa, with a suitable quantity of sulphuret of ammonium; so much should be added, that on standing, the supernatant liquid has a yellow colour. The alumina thus separated is beautifully white.—H. C.

Arsenic in Mineral Waters.—M. Tripier discovered arsenic in the mineral water of Meskontine in Algiers. Waldiner has found that small quantities of copper and arsenic always accompany iron, and may be detected in the ores by the usual method. As the native hydratid oxide of iron, sparry iron ore, and the oolitic and lenticular iron ores of the Jura formation, which may be regarded as the deposits of ferruginous springs, as well as bog iron ore, contain copper and arsenic, the author was led to examine the sediments of chalybeate waters. The sediments of the waters of Griesbach, Rippoldsaw, Teinach, Rothenfels, and Carmstadt, as well as of the hot springs of Ems, Pyrmont, Lamschied, and Brohl, were found to contain excessively minute quantities of copper and arsenic, and that from Wierbaden contained, moreover, a trace of *antimony*, (good news for Mr. De Rottermund.) These metals have been overlooked on account of its being necessary to employ a very large quantity of water in the analysis. Waldiner also found copper and arsenic in some ferruginous soils near Heidelberg, and in several, meteoric stones. It seems probable that the arsenic in the water of Wisbaden is in the form of arsenite of soda.—H. C.

Arsenic in Vinegar.—Deschamps found, on preparing pure acetic acid from wood vinegar, that the latter contained arsenic, derived, probably, from the sulphuric acid employed in manufacturing the pyroligneous acid. As wine vinegar is frequently strengthened with that obtained from wood, Chevalier was induced to examine several samples of ordinary vinegar, and obtained traces of it in some of them. Schafhaenth has also found arsenic in most kinds of iron ores, cast iron, bar iron, and steel of England, France, and Spain, and in the iron of Dannemora. He generally found it accompanied by antimony, tin, and phosphorus.—H. C.

Preparation of Sulphocyanide of Ammonium.—Liebig recommends the following simple process for the preparation of this salt. Two ounces of caustic ammonia of s. gr. 0.95 are saturated with sulphuretted hydrogen: the hydrosulphate of ammonia thus obtained, is mixed with 6 oz. of the same solution of ammonia, and 2 oz. of flowers of sulphur. To this mixture is added the product resulting from the distillation of 6 oz. prussiate of potash, 3 oz. hydrate of sulphuric acid (English acid), and 18 oz. water. The mixture is digested in a water bath until the sulphur is no longer altered, and is then boiled until all excess of sulphuret of ammonium has been expelled, and the liquid becomes colourless. On filtering and evaporating the solution, about 3½ oz. of pure sulphocyanide of ammonium are obtained. This process depends on the fact that the higher sulphurets of ammonium are decomposed by cyanide of ammonium, and reduced to the state of monosulphuret. This compound possesses the power of dissolving free sulphur, reproducing the higher sulphuret, which is again decomposed. On this principle Liebig founds his new

Test for Prussic Acid, which seems to be far superior to the one in common use. The liquid, containing prussic acid, is mixed with a drop or two of sulphuret of ammonium, and heated on a watch glass until the mixture becomes colourless. The solution then contains sulphocyanide of ammonium, and gives the well-known blood red colour with salts of sesquioxide of iron.

Mr. Taylor has published an excellent paper on this new test, in the *Medical Gazette*. He has not only proved the extreme delicacy of the test, as applied in the manner directed by Liebig, but has also invented a new process by which it can be applied in all cases requiring medico-legal investigation.

Mr. Taylor found, that when applied in the manner above described, 1·3930 of a grain of anhydrous prussic acid (in two minims of water), could be readily detected—a quantity not near sufficient to give any decisive indications with the iron and silver tests.

The only precautions to be used in applying the test are, to have the salt of iron neutral, and not in excess, and to evaporate the mixture until all excess of sulphuret of ammonium is destroyed, otherwise we should get a black colour.

In many cases, however, the prussic acid has first to be separated from the substances containing it, such as food or the contents of the stomach. It is not advisable to resort to distillation, and Mr. Taylor has proposed a very ingenious method of applying the test, dependent on the great volatility of the prussic acid, even when combined with an alkali. He places a watch glass, containing a drop of the sulphuret over a vessel containing the suspected liquid—the vapours are absorbed, and sulphocyanide produced, and on evaporating to dryness, the addition of a fersalt of iron produces the red colour. The effect takes place in the short space of ten seconds with 1-12th of a grain of prussic acid, but when the solution is very dilute, ten minutes or more may be allowed. In five minutes he diluted 1·473 part of a grain.

Mr. Taylor made experiments with laurel water, with *one-half of a bitter almond*, the oil of bitter almonds, cyanides of ammonium, potassium, silver, and mercury, (the two last requiring the

addition of muriatic acid,) and also with a number of decomposed organic liquids, such as the contents of the stomach, blood, bile, mucus, &c., to which the 1·71 part of a grain of prussic acid had been added, and found the re-action satisfactory in every case.—H. C.

THE

British American Journal.

MONTREAL, OCTOBER 1, 1847.

FIRST MEETING OF THE CORPORATION OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF LOWER CANADA.

Pursuant to the Proclamation of His Excellency the Governor General, the first meeting of the members of the Profession, whose names appear in the Act for Incorporating the Medical Profession of Lower Canada, was held in the Court-House of this City, on Wednesday the 15th Sept. The Chair was taken at a few minutes after 10. A. M., by Dr. Arnoldi, the President of the College, immediately after which Dr. Bibaud, of Montreal, and Dr. Von Iffland, of Quebec, were appointed joint Secretary to the meeting.

The Proclamation and the Act were read by Dr. Von Iffland. A letter containing a legal opinion from the Hon. the Attorney General, East, was then submitted and read, conveying the intimation that parties whose names, in consequence of clerical errors, had been erroneously printed in the Act, were not disfranchised in consequence; and that it was competent for the meeting, to incorporate with themselves all those who had signified their adherence to the measure, during its passage through the Houses of the Legislature, but whose names had been accidentally or unavoidably omitted. Whereupon it was moved by Dr. Arnoldi, jun., seconded by Dr. Campbell, and resolved—that the following gentlemen be immediately Incorporated:—Drs. Valois, (St. Ann's), Dr. Grosbois, (Chambly), Dr. Boucherville (St. Athanase), Dr. Marsden (Nicolet), Dr. Pyke (St. Andrew's), Dr. Gilbert, (Hatley), Dr. Sabourin, (Longueuil), Dr. Jones, (Missisquoi), and Dr. Smallwood, (St. Martin).

It was now proposed by Dr. Coderre (Montreal), and seconded by Dr. Painchaud (Quebec)—"That every Physician present at this meeting who has not signed the petition presented to the Legislature to Incorporate the members of the Medical Profession into a College of Physicians and Surgeons of Canada East, be recognized as a member of the said College, before this meeting adopts any other proceedings, and that they append their names at the end of those who are Incorporated by the Act of the last Parliament."

A debate ensued on this proposition, which was characterised by considerable acrimony. Drs. Coderre, Painchaud, Regnault, and Bardy, were its chief supporters, while Drs. Nelson, Morrin, and Arnoldi, jun., spoke against it. Confusion rapidly assuming the place of order, the President adjourned the meeting until 2, P. M., in order that a legal opinion might be taken on the question.

At the appointed hour the meeting was again opened by the President, and the opinion of the Hon. the Attorney General East, read, which was to the effect, that additional members could not be incorporated, except under the circumstances previously mentioned, until after the formation of the by-laws. In defiance of the legal opinion, however, Dr. Coderre again pressed his motion, which after a resumed heated discussion, was refused to be entertained by the chair on the grounds of its object contravening the Statute; and consequently nullifying the proceedings of the day, in the event of its being carried.

The question having been thus summarily disposed of, it was proposed by Dr. Painchaud, and seconded by Dr. Roy, "that the following thirty-six names be named the Governors of the College of Lower Canada:—

For the District of Montreal.

Drs. Arnoldi, Sen., Valois, Lebourdais, Trestler, Charlebois, David, Regnault, Kimber, Picault, Tavernier, Sabourin, E. Q. Sewell, D'Orsonnens, Bouthillier, Alexander, (Laprairie.)

For the District of Quebec.

Drs. Rowley, Blanchet, Painchaud, Bardy, Fremont, Blais, Michaud, Nault, Noel, Landry, Laterriére, Marmette, Sewell, Seguin, Robitaille.

For the Districts of Three Rivers and St. Francis.

Drs. Badeau, Gilmour, Rousseau, Malhiot, Fortier, Brassard. Whereupon it was moved in amendment by Dr. Hall, seconded by Dr. Marsden,

"That the election of Governors do take place by ballot, and that scrutineers be forthwith appointed to that intent."

A division ensued upon the amendment, yeas 47, nays 31. And the following are the names taken upon the division—Yeas—Nelson, McCulloch, Campbell, Sauvé, S. C. Sewell, Boyer, Fraser, Mount, Rowand, Sutherland, Arnoldi, jun., Badgley, Hall, Bibaud, David Chamberlain, Howard, Calder, Liddell, Crawford, Holmes, E. Q. Sewell, Keefer, Schmidt, Bouthillier, D'Eschambault, Brown, May, Kimber, Lord, Cartier, Grosbois, Smallwood, Jones, Von Iffland, Morrin, Russel, Douglas, Colby, Marsden, Valois, Charlebois, A. F. Alexander, Parmelle, LaChapelle, Bernard, Pelison—47. Nays—Pelletier, Tavernier, Robillard, Moreau, Coderre, D'Orsonnens, Lebourdais, Regniez, Picault, Dugas, Lafreniere, Painchaud, jun., Ouellet, Roy, Michaud, Landry, Blais, Bardy, Painchaud, sen., Desilets,

Badeau, Beauchemin, Grenier, Coté, Desjardin, Dubord, Harvey, Marmettee, Belleau, Lasisseray, Sabourine.—31.

Dr. Bardy, of Quebec, and Dr. Deschambault, of Montreal, having been requested to act as scrutineers, the ballot was immediately proceeded with, and its result was declared about 7½ p.m. The following is the return in the order of the votes which each received:

FOR THE DISTRICT OF MONTREAL.

Wolfred Nelson, Esq.,.....Montreal.
T. Bouthillier, M.D.,.....St. Hyacinthe.
A. H. David, M.D.,.....Montreal.
A. F. Holmes, M.D.,.....Montreal.
F. C. T. Arnoldi, M. D.,.....Montreal.
T. Kimber, M.D.P.,.....Chambly.
J. B. Lebourdais, M.D.,.....Montreal.
J. G. Bibaud, M.D.,.....Montreal.
M. F. Valois, M.D.,.....Pointe Claire.
F. Badgley, M.D.,.....Montreal.
M. M'Culloch, M.D.,..... "
Wm. Sutherland, M.D.,..... "
A. Hall, M.D.,..... "
B. H. Charlebois, M.D.,..... "
L. F. Tavernier, Esq.,..... "

FOR THE DISTRICT OF QUEBEC.

J. Z. Nault, Esq.,.....Quebec.
J. A. Sewell, M.D.,..... "
M. DeSales LaTerriere, Esq.,....Ebon la Merre.
C. Fremont, Esq.,.....Quebec.
Joseph Morrin, M.D.,..... "
P. M. Bardy, Esq.,..... "
J. Painchaud, M.D.,..... "
J. B. Noel, Esq.,..... "
J. Blanchet, Esq.,..... "
A. F. Michaud, Esq.,.....Kamouraska.
J. Douglas, M.D.,.....Quebec.
J. E. J. Landry, Esq.,..... "
O. S. Robitaille, Esq.,..... "
J. B. Blais, Esq.,..... "
J. Racey, M.D.,..... "

FOR THE DISTRICTS OF THREE RIVERS AND ST. FRANCIS.

W. A. R. Gilmour, M.D.....Three Rivers.
Badeau, Esq.,..... "
T. Fortier, Esq.,.....Gentilly.
Malhiot, Esq.,.....Pointe du Lac.
Brassard, Esq.,.....Nicolet.
W. Marsden, M.D.,..... "

The foregoing names having been duly read over, a vote of thanks was passed to the President, the Secretaries, and the scrutineers, and the meeting was declared adjourned until the following day, on which occasion the Secretaries were directed to notify, officially, the members of their election as Governors, and a general meeting of the Board was summoned to be held in the city of Quebec, on Friday, 24th September, for the purpose of drawing up a code of by-laws and rules for the government of the College.

Such, then, is a summary detail of the proceedings of the first meeting of the corporation, and we regret to be compelled to record, that entire harmony by no means prevailed throughout them; and the chief cause of disunion was Dr. Coderre's motion—which was pressed upon the chair with what we certainly consider an unbecoming pertinacity on the part of those who supported it—whose proceeding, in endeavouring to prove themselves sound lawyers, was characterized less by cogency of reason, than violent declamation. The consequence was, that as the validity of the day's proceedings became immediately affected, if the motion had been carried and action taken on it, the President very prudently adjourned the meeting for the purpose of soliciting legal advice. Based upon the opinion of the Attorney General, that it was competent for the meeting immediately to incorporate all who had signified to the Acting Secretary their adherence to the measure during its passage through the Houses of the Legislature, but whose names had been accidentally or unavoidably omitted, it was immediately inferred by Dr. Coderre and his party, that all who had not signified such adherence, should participate in the same privilege, in direct opposition to the wording of the Act, which directs them to be appointed according to specific by-laws to be afterwards made in their behalf, as follows: "And be it enacted, that Dl. Arnoldi, &c. &c. &c., and their successors, *to be named and appointed as hereinafter described.*" After the temporary adjournment, the opinion of the Attorney General (in the meanwhile obtained), was read, and found to be opposed to the intention of Dr. Coderre's motion, but, nevertheless, the latter was again most unbecomingly pressed, until finally the chair refused to entertain it. Now, the Attorney General was either right or wrong in his advice. To say the least, there is a *prima facie* evidence in his favour arising from his position. Certainly his legal attainments were of a higher order than those of either Dr. Coderre or his party, and if unwilling to have abided by it, they might have taken exception to the results which flowed from it in a more legitimate manner than by a wrangling discussion upon a motion, which was in itself a beautiful instance of a *non sequitur*, and did about as much credit to the logic of its movers, as their arguments savoured of deep legal research. Had Dr. Coderre's motion been carried, the validity of the Board of Governors, as a body legally constituted, would have been destroyed, because elected by parties whose votes were illegal, and the object of that day's meeting would have been nullified.

As to Dr. Painchaud's motion, we have little to say about that—it speaks for itself, and shall remain, as far as this journal is concerned, a standing memento of *his liberality* towards the British practitioners of the Province. He is welcome to the reflection, that his seat as

a governor of the College is due to the votes in his favour of those very British practitioners whom he was desirous of excluding. This much we may be permitted to remark, that it was equally bad, in its consequences, with that of Dr. Coderre. If the tendency of the latter was to vitiate, that of the former was to obstruct and vitiate—to obstruct, because had the amendment been lost, the meeting might have been even now discussing the various subsequent amendments which each individual member would have put in, in accordance with his own views of the composition of the Board;—to vitiate, because it proposed as a governor one who was not even a member.

We observe with great regret that the Eastern Townships and the District of St. Francis are entirely unrepresented at the Board. The votes in favour of several gentlemen from these parts of the Province may be taken as a fair index of the strength of the British party present; powerless to effect what they desired, in consequence of the numbers by which they found themselves opposed.

We beg to call the attention of Physicians generally in this Province, to the following letter from Professor Drake, and to request their co-operation, in favouring him with their observations on the endemial diseases of this part of the continent of North America:—

To the Editor of the British American Journal.

Dear Sir,—Before leaving this city for Kingston, I wish, through your valuable Journal, to make known to the physicians of Canada the object which has brought me hither, and respectfully to solicit communications from them.

I have for several years been engaged by travel and personal observation or intercourse with physicians, in collecting unpublished facts, for a historical and practical treatise on the principal diseases of the central valley of North America. The geographical limits of the region which I have explored, or are still examining, are the mountains, which, on the east, stretch from the Gulf of St. Lawrence to Georgia, in the United States; on the west, the plains beyond Lake Superior and the Mississippi; on the south, the Gulf of Mexico; and on the north, Hudson's Bay. It is my design to give an outline of the physical geography of this extended region, which may be designated as the Basin of the St. Lawrence and the Mississippi, with the medical topography of the most important localities, and an account of the climates from south to north; together with a classification of the inhabitants into the Caucassian, North American, and African varieties; analizing the first into the British and Irish, the French and the German races, so as to develope the peculiarities of physiology and diseases of each.

After this extended detiological introduction will follow such a history of the most important and prevalen diseases of the valley, as can be constructed out of the materials I may be able to collect from those who reside and practise medicine within its borders. In this part of the work I shall aim at tracing all our more important diseases, especially the febrile, through all our varieties of soil, climate and latitude; so as to estimate the detiological influence of these conditions, with the modifications of treatment which they may require. In this way I hope to produce a book of practice that will be indigenous, and give to each of our physicians the experience of every other; or, at least, specimens of the experience in every locality.

Having presented this outline of the proposed work, I will now set forth what I suppose to be the most important points, to which such physicians of Canada as may approve of the plan and be disposed to aid me in its execution, should turn their attention.

1. To Autumnal Fever—Intermittent and Remittent. It is well known that this fever, to borrow a term, scatters out in the north; and I am anxious to ascertain the limits beyond which it is not found, and its symptoms and required treatment, in the highest latitudes in which it occurs.

As continued (idiopathic) fevers prevail in the north, their symptoms, varieties, remedies and anatomical lesions, may be here studied with great facility; and it is particularly desirable to ascertain whether any one of them is to be considered as the *equivalent* of the autumnal remittent fever of the warmer latitudes. The fever statistics of the General Hospital of Montreal, which you have put into my hands, show that your continued fever, whether designated as synochus or typhus, is much more prevalent in summer and autumn than the other parts of the year, which seems to mark it as taking the place of remitting fever; but further observations are necessary to the settlement of this question. How it is propagated—whether by an epidemic constitution of the atmosphere, or by contagious emanation from the bodies of the sick, and its appropriate treatment, are also open questions, on which I find there is, among the physicians of Canada, some variety of opinion.

3. The relations between your endemic continued fever, and that of the Irish Immigrants, deserve to be critically studied. What I have seen of the latter, has shown me, that it differs in several of its phenomena

from the continued fever of the middle latitudes, and inspired me with a strong desire, to know whether in its symptoms, anatomical lesions and appropriate treatment, it is identical with the indigenous continued fever of the Banks of the St. Lawrence.

4. Tubercular Phthisis, so indissolubly associated with cold climates, in the minds of most physicians, seems to me to be less prevalent here than on the banks of the Ohio, in 39° or 38°, where, moreover, it is more prevalent than it is several degrees further south. If there be, as seems probable, a latitude in which it attains its minimum of prevalence, it is of importance to know it, and be able to estimate the comparative value, to the predisposed, of all emigration from that parallel to the north and to the south. Intimately connected with this malady, is scrofula and every other tubercular affection; and facts relative to the whole will be most acceptable to me.

5. Goitre is another endemial malady, prevailing in some localities and entirely absent from others, concerning which I would invite communications.

6. Malignant Pastule or Charbon, common in Louisiana, very little known in the middle states of the Union, but reappearing, in greater frequency, in Canada East, is an affection, the cause and cure of which I greatly desire to learn from the physicians of this region; and, especially, to know whether it attacks the French Canadians oftener than the British. Considered as an epizootic malady, it would be interesting to learn whether it affects other quadrupeds than the cow, and also whether it can be excited in her by the blood or pus from the human subject, if introduced by inoculation.

7. Calculus is a disease which deserves to be studied in connexion with soils, water and climates. In the latitudes 36°—40° it is a common malady. Is it equally so in the latitudes of Canada? To what extent is it connected with dyspepsia, or with any particular kind of drinking water.

8. Are verminous diseases prevalent in Canada? There is some reason for believing them more prevalent in the higher than the lower latitudes.

9. In the south, tetanus and some other plasmadic diseases, are exceedingly frequent. The former is both transuatic and idiopathic. As we advance to the north it becomes less frequent. To what extent does it prevail in Canada? and how often can it be cured?

10. The eruptive fevers, although not produced by climate, may, perhaps, be modified by it, so as to demand a variation in the treatment. Especially, what is the most successful treatment of scarlatina in this country?

11. At what period of the year are acute pulmonary inflammations most prevalent? Does the steady cold of winter generate them? Do they require liberal venesection? Is tartar emetic well adapted to their cure? Do the constitutions of the people of Canada admit of the use of that medicine in Italian doses?

12. What is the most efficient method of treating acute articular rheumatism? Are metastases to the heart and other fibrous organs common, and what methods of treatment seem either to promote or prevent them?

13. Is gout a frequent disease here? Does it affect any but immigrants from Great Britain? Do those who are predisposed to it, escape by emigrating to this country?

14. As Dr. M'Cullough has endeavoured to prove that nearly all neuralgias are produced by malaria, it is desirable to know to what extent they prevail in a region in which, judging from the absence or small amount of intermittent fever, there is so little of marsh exhalation.

15. It appears that Cholera Morbus and Cholera Infantum, are common and fatal diseases in Canada. Has the liberal administration of calomel and opium, so much relied upon in the lower latitudes, been generally resorted to here?

16. Does the water of the St. Lawrence, as some have said, possess an irritating quality in reference to the mucous membrane of the stomach and bowels?

17. Are there any obvious differences in the constitutions and diseases of the French and British inhabitants of Canada?

18. Did the epidemic cholera work out any permanent change in the character of the diseases of Canada? Has it been observed that since its invasion, the lancet and active purging are less safe or beneficial than before.

The points I have raised are the most important; but facts relative to any other forms or peculiarities of disease will be acceptable.*

I hope to commit to the press, in the coming calendar year, the first volume; which will embrace febrile diseases; and would be thankful for communications concerning them at an early period. Letters may be sent at my own expense, by mail, to *Cincinnati, Ohio,* my place of residence.

With much respect, I am, dear Sir, your obedient servant,

DANL. DRAKE, M.D.
Prof. of Pathology and the Practice of Medicine,
University of Louisville, Kentucky.

* In the absence of other statistics, a register for the year, of the deaths from different diseases, in the practice of a physician, throws light on the relative frequency of fatal diseases. Registers of that kind kept in different latitudes and compared, might afford interesting results.

Ledoyen's Disinfecting Fluid.—Since our last issue, Mr. Ledoyen, with Col. Calvert, have appeared in town, and have been busily engaged in experimenting with their fluid, both at the Montreal General Hospital, and Emigrant Hospital at Pointe St. Charles. We have been witness to some of their experiments at the former establishment; and can testify to the purification of the vitiated air of the water closets, and a ward in the hospital in which the atmosphere had been highly impregnated with effluvia emanating from soil purposely exposed. We are, nevertheless, still unconvinced of its being a disinfectant in the true sense of the term. A more proper term expressive of its actual powers would, we think, have been antibromic.

Sir William Burnet's fluid (chloride of zinc) has had its powers tested under similar circumstances, under the supervision of Dr. Stratton, R. N., who is also in town with that object in view. The experiments with it, as far as we have learned, have proved equally as satisfactory as those with that of Mr. Ledoyen.

Request to Physicians in Charge of Immigrant Hospitals.—Physicians in charge of the Immigrant Hospitals in both the Canadas, would confer a favour by forwarding to us, at as early a period as convenient, a statement of the admissions and discharges in their respective Hospitals, with, if possible, the nature of the diseases. The Editor of this Journal is desirous of preparing a statement indicative of the gross results of the diseases affecting the immigrants, and the total mortality attending them. The statistics of the *immigrants only*, admitted into such Hospitals, is desired.

Yellow Fever in New Orleans.—By the New Orleans Medical and Surgical Journal lately received, we regret to perceive the prevalence of yellow fever in that city. The mortality from that cause appears to have steadily and alarmingly increased from the 17th July to August 23. For the week ending July 17, out of 143 deaths, 6 were from yellow fever. For the week ending 24th July, out of 131 deaths, 16 were from yellow fever. For the week ending July 31, 47 out of 177 deaths, resulted from the same disease, and from this period it raged epidemically. Our contemporary observes, "From this time daily reports were published in the daily papers, and the number of deaths from yellow fever for the next week was 133. Since that time the number of cases and the mortality have continued to increase, until at the present writing (Aug. 23), the disease pervades all ranks of society, and the number of deaths for the past week from yellow fever alone, amounts to 324."

Literary Announcement.—We have had submitted to us the MS. of a work "On the Muscles of the Upper Extremity," destined as a guide to students, in their anatomical pursuits, written by Dr. H. Nelson, lately lecturer at the School of Medicine and Surgery in this city. The work is judiciously arranged, and the details are concise, yet comprehensive and lucid.

At the general meeting of the Governors of the College of Physicians and Surgeons, held at Quebec on the 24th ult., a code of By-Laws was adopted, and are to be immediately submitted for the approval of His Excellency the Governor General, in accordance with the Act of Incorporation.

After passing the By-Laws the meeting proceeded to ballot for the officers, when the following were declared duly elected:—

For Quebec, Dr. Morrin, Vice-President.
Von Iffland, Secretary.
For Montreal, Dr. Nelson, Vice-President.
Dr. David, Secretary; and
Dr. Arnoldi, jun., Registrar and Treasurer.

And it was Resolved, that the first meeting of the Governors for examination of candidates, be held in Montreal, on Tuesday, 26th October next.

Medico-Chirurgical Society.—The annual meeting of this Society was held on the 26th ult., and the following were declared the officers for the ensuing year:

Dr. Badgley, President.
Dr. Campbell, 1st Vice-President.
Dr. Sutherland, 2d Vice-President.
Dr. Ed. Sewell, Secretary.
Dr. Fraser, Treasurer.
Drs. C. Sewell, Hall, and Howard, } Committee of Management.

TO CORRESPONDENTS.

We have to acknowledge receipt of a paper "On the Time required to produce Death by a fatal dose of Medicinal Hydrocyanic Acid," from Dr. Sewell; and another "On the Physiology of the Fifth Pair of Nerves, but more particularly of the Opthalmic Branch," from Dr. Howard. These papers are unavoidably postponed, as well also that from Prof. Croft, "On the Yellow Sediment on the Margin of Pools after Rain."

Dr. Gilbert's letter has been also received. We find it impossible to give insertion to it in this number. It will receive due attention in our next,

Bill of Mortality for the City of Montreal, for the month ending August 31, 1847.

Diseases		Male.	Female.	Total.	Under 1.	1 & under 3	3 — 5	5 — 10	10 — 15	15 — 25	25 — 35	35 — 45	45 — 55	55 — 75	75 upwards
Epidemic or Infectious,	Small Pox,	1	2	3	1	1	1	.	.	.	.	.	.	.	.
	Measles,	1	1	2	1	1	.	.	.	.	.	.	.	.	.
	Fever, inclu. typus	80	81	161	11	13	4	11	5	27	22	22	30	15	1
Diseases of Brain and Nervous System,	Dentition,	44	39	83	42	41	.	.	.	.	.	.	.	.	.
	Convulsions,	5	6	11	7	2	.	1	.	.	1	.	.	.	.
	Congest. of Brain	2	1	3	.	.	.	.	1	.	2	.	.	.	.
	Epilepsy,	.	1	1	.	.	.	.	.	1	.	.	.	.	.
	Delirium Tremens	1	.	1	.	.	.	.	.	.	.	.	1	.	.
	Hydrocephalus,	2	.	2	.	2	.	.	.	.	.	.	.	.	.
Diseases of Respiratory Organs.	Consumption,	15	13	28	4	.	.	.	.	7	7	4	5	1	.
	Croup,	2	.	2	1	1	.	.	.	.	.	.	.	.	.
Diseases of Abdominal Viscera.	Diarrhœa,	47	39	86	49	31	3	2	1	.	.	.	.	.	.
	Dysentery,	14	13	27	2	6	.	.	.	.	6	3	5	5	.
	Dropsy,	3	2	5	.	.	.	.	.	.	1	2	1	1	.
	Disease of Liver	.	1	1	.	.	.	.	.	1	.	.	.	.	.
	" Kidneys	1	1	2	.	.	.	.	.	1	.	1	.	.	.
	" Spleen	1	.	1	.	.	.	.	.	.	.	1	.	.	.
	Worms,	.	2	2	1	.	1	.	.	.	.	.	.	.	.
	Childbirth	.	5	5	.	.	.	.	.	.	1	3	1	.	.
Other causes and Diseases, and Diseases not specially designated,	Inflammation,	9	9	18	8	2	2	1	.	2	.	2	.	1	.
	Marasmus,	9	13	22	17	3	.	2	.	.	.	.	.	.	.
	Debility,	4	2	6	.	.	.	.	.	.	.	.	1	2	3
	Still-born,	8	6	14	14	.	.	.	.	.	.	.	.	.	.
	Abscess,	1	.	1	.	.	.	.	.	.	.	.	1	.	.
	Accid'nt'l & drow'd	9	.	9	.	.	2	1	1	.	3	.	1	1	.
	Other Causes,	14	6	20	2	.	.	.	.	6	1	4	3	4	.
	Total,	273	243	516	160	103	13	18	8	45	44	42	49	30	4

Besides the above, there were buried in the city cemeteries, 167 Immigrants,—82 males and 85 females. Of these there died under 1, 37; 1 and under 3, 20; 3 to 5, 15; 5 to 10, 6; 10 to 15, 5; 15 to 25, 15; 25 to 35, 32; 35 to 45, 20; 45 to 55, 17. The principal diseases were, Diarrhœa, 47; Dysentery, 28; Fever, 45; other diseases, 47.

MONTHLY METEOROLOGICAL REGISTER AT MONTREAL FOR AUGUST, 1847.

Date.	Thermometer.				Barometer.				Winds.			Weather.		
	7 A.M.	3 P.M.	10 P.M.	Mean.	7 A.M.	3 P.M.	10 P.M.	Mean	7 A.M.	Noon.	6 P.M.	7 A.M.	3 P.M.	10 P.M
1,	+70	+83	+63	+76.5	29 64	29.64	29.65	29.64				Fair	Fair	Fair
2,	" 64	" 78	" 64	" 71.–	29.69	29.68	29.71	29.69				Fair	Fair	Fair
3,	" 74	" 81	" 66	" 77.5	29.70	29.73	29.72	29.72				Fair	Fair	Fair
4,	" 66	" 84	" 70	" 75.–	29.69	29.62	29.62	29.64				Fair	Fair	Fair
5,	" 70	" 86	" 68	" 78.–	29.58	29.50	29.46	29.51				Fair	Fair	Fair
6,	" 67	" 78	" 65	" 72.5	29.41	29.37	29.49	29.43				Fair	Fair	Rain
7,	" 65	" 77	" 67	" 71.–	29.60	29.63	29.68	29.64				Fair	Fair	Fair
8,	" 62	" 68	" 62	" 65.–	29.75	29.80	29.87	29.81				Fair	Cloudy	Fair
9,	" 62	" 76	" 72	" 69.–	29.90	29.86	29 93	29.86				Fair	Fair	Fair
10,	" 70	" 89	" 74	" 79.5	29.86	29.82	29.79	29.82				Fair	th.&rn.	Fair
11,	" 70	" 83	" 70	" 76.5	29.77	29.74	29.74	29.75				Rain	Fair	Rain
12,	" 67	" 79	" 68	" 73.–	29.74	29.73	29.74	29.74				Cloudy	Fair	Fair
13,	" 76	" 78	" 69	" 77.–	29.77	29.77	29.76	29 77				Fair	Fair	Fair
14,	" 70	" 88	" 73	" 79.–	29.71	29.66	29.65	29.67				Fair	Fair	Fair
15,	" 78	" 86	" 73	" 82.–	29.65	29.67	29.65	29.66				Fair	Fair	rn.&th.
16,	" 74	" 87	" 70	" 80.5	29.66	29.62	29.59	29.62				Rain	Fair	Fair
17,	" 75	" 88	" 72	" 81.5	29.56	29.44	29.39	29.46				Fair	th.&rn.	Rain
18,	" 71	" 73	" 58	" 72.–	29.34	29.38	29.37	29.36				Rain	Fair	Fair
19,	" 54	" 58	" 55	" 56.–	29.40	29.41	29.44	29.42				Cloudy	Sh'w'rs	Rain
20,	" 58	" 71	" 55	" 64.5	29.47	29.45	29 46	29.46				Fair	Cloudy	Fair
21,	" 60	" 74	" 63	" 67.–	29.50	29.50	29.64	29 55				Fair	Fair	Fair
22,	" 64	" 78	" 58	" 71.–	29.55	29.59	29.66	29.60				Fair	Fair	Fair
23,	" 58	" 70	" 60	" 64.–	29.74	29.75	29.77	29.75				Fair	Fair	Fair
24,	" 59	" 75	" 59	" 67.–	29.83	29.85	29.89	29 86				Fair	Fair	Fair
25,	" 62	" 78	" 61	" 70.–	29.95	29.91	29.88	29.91				Fair	Fair	Fair
26,	" 70	" 80	" 62	" 75.–	29.82	29.72	29.62	29.72				Fair	Fair	Fair
27,	" 62	" 76	" 60	" 69.–	29.53	29.57	29.62	29.57				Rain	Fair	Fair
28,	" 60	" 81	" 65	" 70.5	29.70	29.68	29.66	29.68				Fair	Fair	Fair
29,	" 60	" 78	" 62	" 69.–	29.66	29.69	29.74	29.70				Fair	Fair	Fair
30,	" 61	" 85	" 70	" 73.–	29.76	29.69	29.63	29.69				Fair	Cloudy	Cloudy
31,	" 58	" 72	" 55	" 65.–	29.68	29.72	29.74	29.71				Fair	Cloudy	Fair

Therm. { Max. Temp., +89° on the 10th. / Min. " +54° " 19th. } Mean of the Month, +72°

Barometer, { Maximum, 29.95 Inches on the 25th. / Minimum, 29.34 " " 18th. } Mean of Month, 29.66 Inches.

(For the Brit. Amer. Journ. of Med. and Phys. Science.)

MONTHLY METEOROLOGICAL REGISTER AT H.M. MAGNETICAL OBSERVATORY, TORONTO, C. W.—August, 1847.

Latitude 43°. 39′.4. *N.* *Longitude* 79°. 21′.5. *W.* *Elevation above Lake Ontario*, 108 *Feet.*

Day.	Barometer at Temp. of 32°.				Temperature of the Air.				Tension of Vapour.				Humidity of the Air.				Wind.			Rain in. on surf.	Weather.
	7 A.M.	3 P.M.	10 P.M.	Mean of 24 h.	7 A.M.	3 P.M.	10P.M	Mean of 24h	7A M	3 P.M	10P.M	Mean of 24h	7A.M	3P.M	10P.M	Mean of 24h	7 A.M.	3 P.M.	10 P.M.		
1,	29.630	29.628	—	—	64.1°	69.6°	—	—	.465	.457	—	—	.80	.65	—	—	S. W.	S. S. W.	——	0.025	Generally overcast.
2,	29.740	29.731	29.760	29.753	58.8	72.2	60.0°	62.5	.423	.492	.394	.416	.87	.64	.78	.75	Calm.	S.	Calm.	—	Det. pass. cl'ds. Gen clear. Fair.
3,	29.801	29.757	29.726	29.752	61.6	71.8	54.7	62.9	.418	.431	.367	.409	.78	.56	.88	.74	Calm.	S. by E.	Calm.	—	Clear, save a few pass. cl'ds. Fine.
4,	29.715	29.625	29.553	29.603	65.3	75.6	58.2	65.9	.453	.543	.406	.465	.75	.63	.86	.76	Calm.	S. by E.	Calm.	—	M'tly cl'r. Brilliant Aurora from 10 pm to 4 am of 5th.
5,	29.484	29.368	29.311	29.363	65.1	74.2	63.8	67.0	.459	.486	.444	.490	.76	.59	.77	.76	Calm.	E.	E.	—	Mostly clear. Light cl'ds dispers. Fine.
6,	29.302	29.315	29.398	29.362	65.4	76.4	66.7	68.6	.474	.601	.510	.525	.77	.68	.80	.78	Calm.	Calm.	N. by W.	—	Cloudy, Thunderstorm, Lightning and rain 4 to 6h 25m pm
7,	29.523	29.534	29.569	29.594	59.8	71.0	62.0	65.3	.377	.482	.438	.474	.75	.65	.81	.78	N. N. E.	S. E.	Calm.	0.445	R'ng 2 to 4 am. Halo r'd sun 2 pm. Cl'dy
8,	29.674	29.694	—	—	60.6	62.4	—	—	.465	.510	—	—	.89	.93	—	—	E.	E. by N.	——	0.010	Dens. cl'd. R'ng sl'tly most of day.
9,	29.796	29.783	29.791	29.789	63.2	74 3	68.0	67.5	.529	.666	.594	.582	.94	.81	.89	.89	E.	E.	Calm.	0.145	Gen cl'd. Sht l'tng 8h 20m to 11h 20m pm
10,	29.816	29.761	29.755	29.771	66.0	75.7	67.6	69.9	.591	.659	.613	.629	.96	.76	.93	.89	Calm.	Calm.	Calm.	—	Overcast. Light clouds and haze. Foggy am. Slight rain 3 pm
11,	29.751	29.739	29.761	29.749	67.1	67.0	60.8	65.2	.615	.572	.481	.557	.93	.90	.92	.91	Calm.	W N W	Calm.	not ap	Gen cl'd. R'ng sl'tly fr. 1 to 3h 30m pm
12,	29.780	29.741	29.708	29.735	59.0	74.8	66.5	68.0	.451	.649	.581	.575	.92	.77	.92	.86	Calm.	Calm.	Calm.	0.055	Gen cl'd. Dense fog from 4 to 7 am.
13,	29.724	29.624	29.595	29.628	66.6	74.0	67.0	70.2	.572	.619	.576	.621	.90	.76	.90	.87	Calm.	E. by S.	Calm.	—	Cloudy. Sheet lightning 11 pm.
14,	29.583	29.560	29.600	29.575	68.8	78.4	67.2	71.0	.647	.769	.591	.651	.95	.81	.91	.88	Calm.	S. by E.	Calm.	0.030	Lightning and rain 0 and 1 am. Day cloudy. Thun & lightning pm
15,	29.632	29.567	—	—	75.5	81.0	—	—	.710	.748	—	—	.84	.72	—	—	Calm.	S. E.	——	—	M'tly cl'r. L't cl'ds dispersed. Fair.
16,	29.579	29.572	29.501	29.533	70.9	82.0	66.8	72.8	.662	.691	.581	.640	.90	.65	.91	.82	Calm.	S. S. W.	Calm.	—	Gen cl'd. Sheet l'tng am & at 8 pm.
17,	29.454	29.344	29.358	29.376	72.3	71.0	62.3	66.3	.714	.665	.457	.574	.93	.90	.83	.89	Calm.	S W by S.	N. N. W.	—	Cl'd. Fog. Th, l'tng, & r'n most of aft.
18,	29.445	29.469	29.514	29.493	57.0	67.4	51.2	56.5	.397	.346	.279	.315	.87	.52	.75	.71	WNW	N.W. 2.0	Calm.	0.785	Cl'd till 7 pm. Remainder clear.
19,	29.560	29.517	29.535	29.533	49.8	66.0	55.3	57.4	.281	.294	.306	.296	.81	.47	.71	.65	Calm.	WNW 1.5	W.	—	Gen clear. Detached clouds. Fine.
20,	29.534	29.439	29.520	29.502	58.8	72.6	56.8	60.6	.383	.339	.390	.388	.78	.43	.86	.76	W. by N.	NWbyW*	W. by N.	—	Cloudy. R'n with dist thun fr 2 to 6 pm
21,	29.559	29.549	29.568	29.607	56.9	73.2	57.2	61.7	.310	.341	.345	.329	.68	.43	.75	.63	WNW	NNW 1.0	Calm.	0.165	Cl'r, save few pass cl'ds. Aur l't 11 pm
22,	29.632	29.629	—	—	67.0	72.4	—	—	.372	.326	—	—	.57	.42	—	—	N. N. W.	NNW	——	—	Clear and unclouded. Very fine.
23,	29.795	29.773	29.807	29.799	58.7	68.0	53.8	59.2	.372	.505	.377	.399	.77	.76	.93	.81	W. by N.	S.E. by S.	E. N. E.	—	Aur l't 2 & 3 am. Mostly clear. Light clouds remainder of day.
24,	29.872	29.878	29.897	29.891	57.0	70.1	54.7	61.1	.382	.411	.350	.390	.84	.57	.83	.74	Calm.	S. by E.	Calm.	—	Cl'dy. Foggy, 4 & 5 am, & at 9 & 10 pm
25,	29.929	29.891	29.806	29.860	56.8	70.8	56.6	61.6	.363	.424	.389	.407	.80	.59	.86	.76	Calm.	E. by S.	Calm.	—	Gen unclouded. Hazy. Fine.
26,	29.747	29.593	29.516	29.590	58.0	74.4	66.2	65.9	.423	.608	.470	.512	.90	.74	.75	.82	Calm.	S. S. E.	S. S. W.	—	L't cl'ds dispersed. Drops of rain 11 pm
27,	29.591	29.620	29.629	29.626	56.5	63.6	54.2	57.8	.386	.421	.378	.370	.86	.73	.91	.79	N. W.	S. S. W.	Calm.	0.175	Raining from midnight till 3h 45m am. am cloudy. Clear from 3 pm
28,	29.666	29.618	29.639	29.649	53.6	67.8	56.1	60.6	.346	.396	.407	.412	.86	.60	.92	.80	Calm.	Calm.	Calm.	—	Cl'r, except a few l't cl'ds r'd hor. Fine
29,	29.721	29.671	—	—	65.4	68.0	—	—	.429	.464	—	—	.71	.70	—	—	E. N. E.	E. S. E.	——	—	Light cl'ds dispers. M'tly cl'r. Fine
30,	29.674	29.583	29.649	29.653	64.1	70.4	59.1	62.5	.525	.501	.433	.459	.90	.70	.88	.83	E. S. E.	S. S. W.	Calm.	—	Cl'dy. Thun and rain from 5 to 6 pm
31,	29.789	29.765	29.711	29.744	53.7	62.4	48.2	54.1	.364	.367	.290	.325	.90	.67	.88	.80	Calm.	S E. by S.	Calm.	0.305	Halo round moon, 4 am. Clouded till 5 pm. Clear from 8 pm.
Mean	29.662	29.621	29.622	29.636	61.18	71.73	60.04	63.93	.458	.511	.440	.470	.85	.67	.85	.80		* 20th, 2.0		2.140	

Highest Barometer, 29.953 at 8 a.m. on 25th.
Lowest do. 29.263 at 5 a.m. on 6th. } Range 0.690
Highest Temperature, 82°.6 on 16th, at 5 pm
Lowest do. .. 44°.6 on 19th, 5 a.m. } Range 38.0
Mean Daily Range, .. 17°.95
Extreme Daily Range, 26° .2 from 4 am. to 4 pm of 4th.
Greatest Day's Wind, 18th, mean pressure, 0.71 lbs.

Proportion of Wind from each Quarter—
N.W. 104 | Total.
S.W. 57 | Winds, 295
S.E. 107 | Calms, 329
N.E. 27 | Obser., 624
Maximum force of the Wind on 20th, at 3h 20m pm, 4.5.—Mean force of the Wind, 0.19 lbs.

Temperature for August.

Year.	Mean.	Max.	Min.	Range.
1840, ...	65.1°	82.4°	47.7°	34.7°
1841, ...	64.6	84.8	45.7	39.1
1842, ...	65.9	81.8	43.9	37.9
1843, ...	66.49	83.1	44.0	39.1
1844, ...	61.16	86.8	43.5	43.3
1845, ...	67.86	84.8	41.5	43.3
1846, ...	68.41	86.4	49.5	36.9
1847, ...	63.93	82.6	44.6	38.0

Rain.

No. Days.	Inches.
12	2.905
9	6.170
6	2.500
4	4.850
17	imper
9	1.725
9	1.770
10	2.140

Wind.

Winds.	Calms	Mean force.
		0.19
157	155	0.30
379	289	0.12
282	366	0.16
295	353	0.19
366	258	0.17
292	331	0.19
295	329	0.19

Under the head of Tension of Vapour, is given the elastic force of the Aqueous Vapour in the Atmosphere at each Observation, in decimals of an inch of Mercury, or the proportion of the Barometric pressure due to its presence.
Under the head of Humidity of the Air, is given the proportion the Aqueous Vapour bears to the quantity the air is capable of sustaining at the existing temperature, saturation being represented by 1.00.
The Instruments are Standard Instruments. The Rain Gauge is 27 feet above the soil.—The Means entered are the Means by 24 hourly Observations, from 6, a.m., to 6, a.m.
The quantity of Rain received for the last 24 hours, is noted at 9, a.m.
The Observations entered at 7 a.m., on Sundays, are actually taken at 9 a.m. The two Observations taken on Sundays are not included in any of the means.