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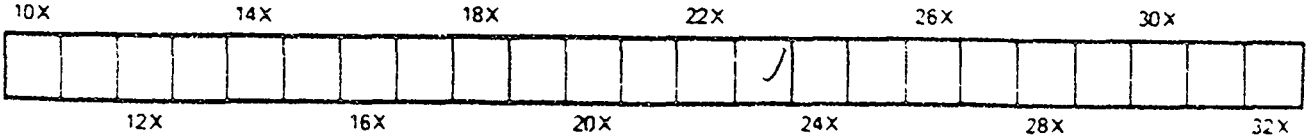

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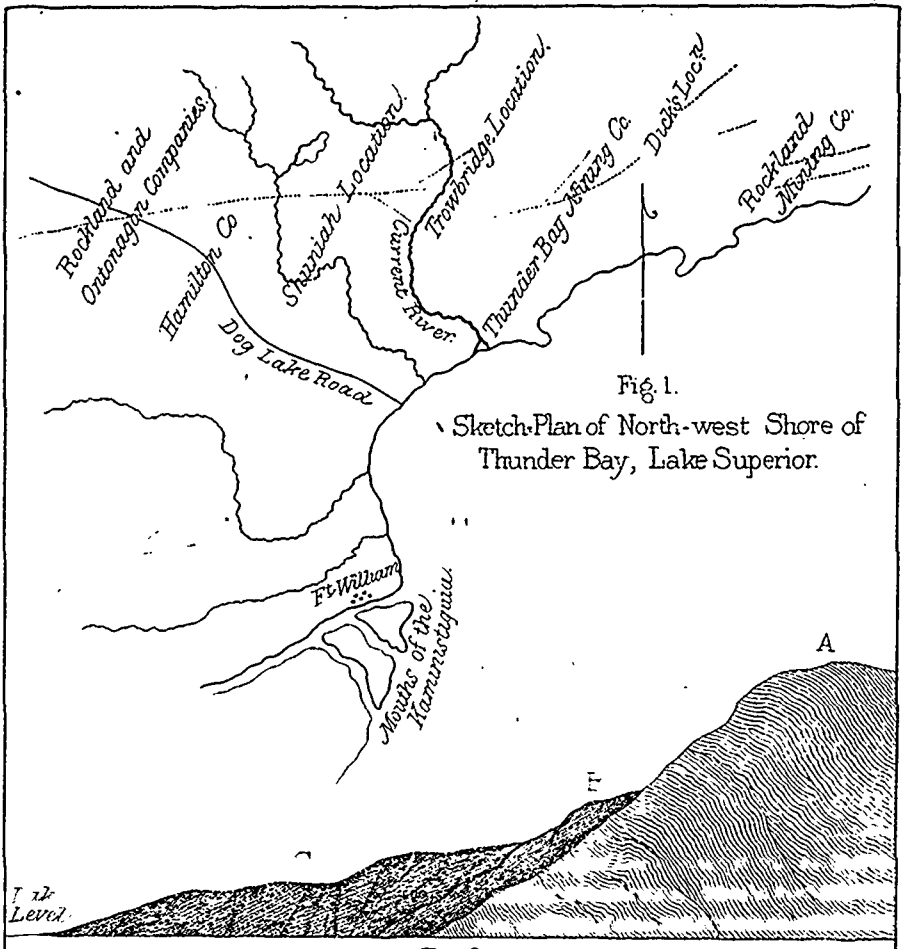


Fig. 1.

Sketch-Plan of North-west Shore of Thunder Bay, Lake Superior.

Fig 2.

Diagram of Rock Formations on North Shore of Lake Superior.

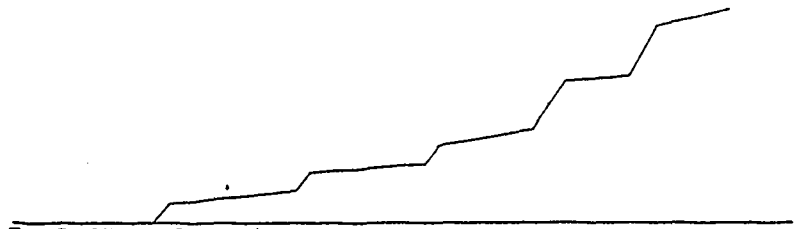


Fig. 3.

Step-like outline of Thunder Cape, as seen from the South East.

E. J. C.
June 1869.

Garnett & Co. Lith. Toronto.

THE CANADIAN JOURNAL.

NEW SERIES.

No. LXX.—NOVEMBER, 1869.

ANALYSES OF SOME CANADIAN MINERALS.

BY E. J. CHAPMAN, PH. D.

PROFESSOR OF MINERALOGY AND GEOLOGY IN UNIVERSITY COLLEGE, TORONTO.

1. *Graphite:* from the township of Buckingham, on the Ottawa, (lot 19, range 5).

The sample employed in this analysis was apparently very pure: soft, black, sub-foliated, and highly lustrous. Sp. gr. = 2·265. The moisture was determined by desiccation in an air-bath at a temperature of 212°. The carbon was then burnt off by prolonged ignition in the muffle of an assay-furnace; and the resulting ash was fused with carbonate of soda in a platinum vessel, and decomposed in the usual way by chlorhydric acid. 6·314 grammes lost 82 milligrammes by complete desiccation, and left 1·1731 gramme of very faintly coloured ash after exposure to long continued ignition. The analysis thus yielded:

Carbon	80·12		
Ash	18·58	Silica	12·86
		Alumina	4·33
		Fe O (from $Fe^2 O^3$)...	1·07
		Lime	0·14
		Magnesia	trace
		Loss	0·18
Moisture	1·30		

Another sample (sp. gr. = 2·272) yielded: moisture 1·14, ash 22·06, carbon (by difference, as before) 76·80. The composition of the ash was not determined.

2. *Silver Glance :* from Thunder Bay, Lake Superior.

The sample consisted of a small mass of distorted crystals (combinations of cube and octahedron), perfectly sectile and malleable. Sp. gr. = 7·31. Decomposition was effected by nitric acid; the silver weighed as Ag Cl; and the sulphur partly as S, and partly as Ba SO^4. The analysis of 1·933 gramme yielded in per centage values :

Sulphur	13·37
Silver	86·44
Copper	faint trace

3. *Magnetic Pyrites :* from Madoc (lot 18, con. 2).

Some carefully selected fragments, apparently quite free from FeS^2, were taken for the analysis, and decomposed by chlorhydric acid with subsequent addition of nitric acid. They were strongly magnetic, and the mass from which they were separated exhibited well marked magnetic polarity. Their sp. gr. was equal to 4·485; but most examples from this locality, in consequence of intermixed silica or siliceous rock-matter, vary, as regards sp. gr., from about 4·2 to 4·3.

The picked fragments yielded :

Sulphur	39·98
Iron	59·66

The sample contained no trace of either nickel or cobalt. An assay of 50 grammes, for gold, left nothing on the cupel.

In another examination, the sulphur was determined by decomposing a portion of the finely powdered mineral with nitre and carb. soda in a porcelain crucible. 1·155 gramme gave 3·377 grammes of Ba SO_4. This is equivalent to 40·17 per cent. of sulphur.

4. *Arsenical Pyrites :* from Tudor, in Hastings county.

This sample, if I may so call it, was not analysed, as it consisted merely of a few minute but well-defined crystals, given to me some time ago by my colleague, Professor Croft. Two of these little crystals, examined by the blowpipe, shewed unmistakably the re-action of cobalt; and the presence of this metal appears to be connected with a crystallographic peculiarity in these and other crystals of mispickel. The more common crystals of this mineral, consist, it is well known, of a rhombic prism combined with the planes of a side-polar or brachydome $\frac{1}{4}\breve{\infty}$. In these Tudor crystals, the brachydome in question is replaced by two of less obtuse type, namely, $\frac{2}{5}\breve{\infty}$ and $\breve{\infty}$. Now, the

form $\frac{1}{2}\frac{0}{0}$, the summit angle of which equals 118° 30′, is a comparatively rare form, but it appears to be always present in the cobaltiferous varieties of mispickel, and in the allied species glaucodot.

5. *Arsenical Pyrites :* from Marmora.

Assays of several samples of coarsely crystalline mispickel from this locality, have yielded me comparatively large amounts of gold. In some specimens "free gold" is present in visible specks and grains, but from samples in which no trace of gold could be perceived under the magnifying glass, I have obtained returns varying from 1 oz. 3 dwts. 8 grs. to 3 oz. 8 dwts. 20 grs. in the ton of 2,000 lbs. of ore.

6. *Prehnite :* from Slate River, Lake Superior.

The specimen analysed was obtained personally, in the summer of 1868, from Slate River, a rocky stream which enters the Kaministiquia about fourteen miles above the mouths of the latter on Thunder Bay. The specimen formed part of a narrow vein of more or less compact Prehnite, which cuts at that place the high cliffs of dark alum-bearing slate, or shale, forming the sides of the ravine through which the river flows. These slates belong to the lower portion of Sir William Logan's "Upper Copper-bearing Series of Lake Superior." Near the Prehnite vein, a very remarkable dyke of dark grey Trap or Dolerite crosses the river. The stream has cut its way through it, and as the cliffs at that spot have been much wasted by atmospheric action, the dyke stands out like a wall, varying from about ten to thirty feet in height, with a width of about three feet. On the right bank also, where it retains its wall-like aspect to the edge of the stream, it has been hollowed out into an arch through which a man might pass without stooping.

The Prehnite was only partially (or at least, very slowly) attacked by chlorhydric acid. It was therefore decomposed by previous fusion with carb. soda, the water being of course determined separately. Sp. gr. = 2·882.

The analysis yielded :

Silica	43·41
Alumina	23·80
Sesquioxide of iron	1·26
Sesquioxide of manganese	0·53
Lime	26·62
Water	4·14

$= 2\,Ca\,O,\ Al^2\,O^3,\ 3\,Si\,O^2,\ H^2O.$

7. *Manganese Ochre:* from north-east side of Thunder Bay, Lake Superior.

This is an earthy mixture of iron and manganese ochres containing an unusually small amount of water. I did not collect the sample personally, but I am informed that it came from a bed of considerable extent on the shore of the Bay. When sent to me, it was in the form of a dry coarse powder of a dark brown colour. The colour is scarcely changed, after even long ignition in the air. The analysis yielded:

Sesquioxide of iron	33·68
Sesquioxide of manganese ...	22·18
Lime	0·81
Carbonic acid	3·78
Water	3·82
Insoluble rock-matter	36·12
	100·39

It is evident however that part of the manganese (with perhaps a portion of the iron) is present in the state of carbonate. The analysis might therefore be written more correctly as follows:

Sesquioxide of iron.....	33·68		
Sesquioxide of manganese..	16·54		
Protoxide of manganese ...	5·08	= Carbonate manganese...	8·23
Lime	0·81	= Carbonate of lime.....	1·44
Carbonic acid	3·78		
Water	3·82		
Insoluble rock-matter	36·12		
	99·83		

The water and carbonic acid are determined in a separate portion of the substance, the values, given above, being the mean of two determinations. Special tests for sulphuric and phosphoric acids shewed the presence of these bodies in very slight traces.

The less exposed portions of this ochreous deposit would probably be found to consist very largely of carbonates.

RACE HEAD-FORMS AND THEIR EXPRESSION BY MEASUREMENTS.

BY DANIEL WILSON, LL.D.

PROFESSOR OF HISTORY AND ENGLISH LITERATURE, UNIVERSITY COLLEGE, TORONTO.

The significance of "race" as an element in the progress of diverse nationalities has acquired an importance in modern times, wholly unknown to early historians. The origin of races is still one of the mysteries of science, but the influences arising from the diversity of ethnical character were already in operation at the very dawn of history. Nearly two thousand years before the Christian era, the monuments of Egypt recorded the relations of a dominant fair, or, as conventionally coloured, a red-skinned orthognathic race, with one of the very same Negro type as that which has been the servant of servants through all later centuries. Thus remote in the period to which such well defined diversities can be traced: their significance has been assumed by some as the index of a wholly independent origin; and hence the term "race" has come to be used necessarily with definitions or limitations. It may suffice here to borrow those of an author whose writings will furnish subject for some comment in the following pages.

"Though I have frequently found it convenient to use the word *race*," says Mr. Luke Owen Pike, in his *English and their Origin*, "I wish it to be understood that I do not commit myself to any theory about the first origin of the different races of mankind. I simply recognize the fact that there are various peoples possessing common characteristics in which they differ from other peoples, and which they hand down to their descendants with little change." Thus far it may be assumed that all are agreed. No one, moreover, doubts that those differences are moral as well as physical; and not only influence the dealings of Englishmen with Hindoos, Maories, Caffres, and Red Indians, but perpetuate the divisions of their common nationality, as English, Welsh, Scots and Irish. On this continent, indeed, the interblending of such minuter ethnical divisions is more rapid; yet even here the term "Anglo-Saxon," so familiarly used, applies rather to a common language than a homogeneous race.

Races perish, nevertheless, as well as individuals. But some of the distinguishing characteristics of buried races have out-lasted the overthrow of nationalities, and the results of revolutions traceable to the very causes which they serve to illustrate. Hence the interest attaching to the collection and study of human crania. "Of all the peculiarities in the form of the bony fabric," says Dr. Prichard, "those of the skull are the most striking and distinguishing. It is in the head that we find the varieties most strongly characteristic of different races." By such evidence we may review successive migrations and revolutions, even of prehistoric times: as the geologist finds the tide marks of still remoter ages petrified in the living rock.

A skilled comparative anatomist and ethnologist, on forming a collection of crania from some old frontier burial-ground on this American continent, would experience little difficulty in arranging them, for the most part, according to ethnical classification. He would, indeed, meet with puzzling variations from his assumed types; and the greater his experience, the more readily would he admit that among crania collected from cemeteries exclusively pertaining to races apparently the most pure, examples are to be looked for irreconcileable with their preconceived head-forms: and which, if submitted to him without some such clue to affinity as the locality indicates, he would be unable to assign with certainty to any specific race. Nevertheless, after all due allowance for such abnormal crania, there is, on the whole, a sufficiently well-defined prevalence of certain specialities in form and proportions, to guide the craniologist in an approximate classification open to little dispute. As a general rule, it may be assumed that he is not likely to confound the European with the American Indian skull, or either with that of the Negro; nor can he err in the classification, at least, of well marked examples of minor types, such as separate those of European descent into French, German and English. He would find, accordingly, among the crania of the supposed frontier cemetery a brachycephalic, or short and broad skull, with largely developed maxillaries and zygomata, prominent superciliary ridges, a comparatively narrow and poorly developed frontal region, and flattened or truncated occiput, great facial breadth, both at the cheek bones and in the square, massive lower jaw, and prominence in the nasal bones. This he would recognise as the native American head: Micmac, Abenaki, Narraganset, Mohican, Iroquois, Massachusett, Powhattan, or the like, according to the locality of his researches. Tribal deviations from the assumed

typical American head might possibly help him in this minuter classification; but he would be in little danger of mistaking the head of the Indian for that of his European supplanter.

In the same old cemetery, whether *north or south*, the ethnologist would not fail to recognize among his collection of crania a type contrasting in many respects most strikingly with the previous one. The face is indeed broad, by reason of the large malar bones and zygomata; but the forehead is narrow and retreating, the nasal bones are small, the profile markedly prognathous, and the brain-case long and narrow, with prominent occiput. It tells of the Negro from Western Africa: Mandingo, Fanti, Yarriba, Fulah, or the like, *intruded on the areas of* extinct Indian tribes, found intractable alike by Spanish and English colonists in the enforced servitude of the plantations.

Alongside of *those* lie, in certain localities, on the St. Lawrence, the Penobscot, and other rivers, a peculiar type, or types of head-form, divisible into a long ovoid, and a short, globular one: ascribed, after careful study, on the one hand to the Breton colonist, and on the other to the Franco-Norman, by whom at different periods French colonisation was effected in Lower Canada, Nova Scotia, New Brunswick and Maine.

To the south of those localities, on the Hudson and the Delaware, another short oval or rounded form tells of old and later emigrants from the upper and lower Rhine; but with them, in ever preponderating numbers, occurs a long oval form, divisible into two classes, the one more uniform, the other with the frontal region longer and narrower: traceable to the Anglo-Saxon and Anglo-Celtic colonists who are making a new England and a new Britain of the Western Hemisphere.

Nor will the observant craniologist fail to recognise among his collected crania suggestive traces of hybridity. The native American type, with its characteristic features modified, tells by means of its longer form, less massive jaws, and slighter superciliary ridges, of the adopted half-breed, *dwelling on terms of equality with the supplanters* of his aboriginal ancestry; or the softened traits of the long, prognathous negro skull—far more abundant than the pure type-form,—show that no prejudice of race prevented the multiplication of a breed of slaves partaking no less of the blood of the dominant white than of the negro bondsman.

Some localities are still purely French, or German; others are the *reserves of civilised Indians, or plantations tilled exclusively by those* of African descent; and in all of them the local cemetery tells the

tale of the rude forefathers of the settlement. In the great centres of modern industry and progress it is otherwise. There the Old Englander and New Englander, Hollander, Swede, Saxon and Celt, have jostled and intermingled; while the half-breed Indian and Negro have been driven out or absorbed. But still the osteological evidence accords with the change; and the very vagueness of type, though with a predominant long oval, neither wholly Saxon nor Celtic, tells of the interblending of many old and later nationalities with the so-called Anglo-Saxon masters of the New World.

In this, as in so many other ways, there lie buried beneath our feet the chronicles of past events, recorded in characters, long-enduring, if not ineffaceable; and preserving for us a history decypherable by those who will give due diligence to their interpretation.

The comparative recentness of the events thus recorded, and the consequently well defined traces of their diverse phases, render this ethnical chronicle of the New World one of easy interpretation. Nevertheless it illustrates what has been transpiring on old historic areas from the dawn of Assyrian, Phœnician, Greek or Roman history. The ancient cemeteries of France or Britain tell to the educated eye of the intelligent observer a similar tale of Turanian, Celtic, Roman, Germanic and other intrusions: all processes in the change which converted old Gaul into modern France, and Celtic Britain into Saxon England.

The Roman conqueror came into collision with the native Gaul and Briton. But when that event occurred the Christian era was close at hand; and we are becoming more and more familiar with the idea of pre-Celtic and non-Arian occupants of Europe in its prehistoric centuries. What we assume from the recovery of long buried evidence, as the succession of events in prehistoric Europe, agrees with what has been produced in modern centuries by later western movements of the nations. On the American continent we still witness rude, *savage aborigines, retiring and perishing before the advance of the* very same predominant races by whom a similar change appears to have been wrought in Europe. Here, too, we are familiar with the meeting, and to some extent the intermingling, of races of the most diverse types. The dark-skinned, wooly-haired, long and narrow-headed, prognathous Negro has been brought to supplant the red, or olive-skinned Indian, with coarse, straight black hair, orthognathic profile, and short, broad head. But ere the living type disappears, we are invited to compare it with that of a distinct race, the so-called Mound

Builders, supposed preoccupants of the Ohio and Mississippi valleys, and developers of a partial civilization there, before the advent of the Red Indian to the east of the Rocky Mountains, or south of the great lakes. This opinion rests, in part, on the evidence of numerous earth-works and remains of primitive art; but also on some rare examples of a head-form still more compact and brachycephalic than the shortest of Red Indian skulls. But the prevalence of cremation in the sepulchral rites of this extinct race has hitherto rendered the researches of explorers of little avail for the craniologist. Examples of true mound-skulls are as yet too few to justify absolute conclusions in reference to a well-defined type. To a considerable extent, indeed, it must be admitted that the assumed Mound-Builder type of head has been mainly deduced from a single, very remarkable, but possibly exceptional example.

Whilst, however, increasing experience warns us of the danger of basing comprehensive ethnical classifications on a few examples, the significance of head-form, as a test of race, is widely recognized; and with the admission of the value of such type-forms, the modes of indicating them excite new interest. It is not sufficient now that we are satisfied of the recovery of a human skull from the loam of the Neanderthal cave, in the limestone cliff overhanging the river Dussel; or in the same breccia with the fossil elephant, rhinoceros, and hyena of the Engis cave, near Liége. We want, if possible, to know what ethnical evidence they supply; and ere long find M. Pruner-Bey demonstrating to the Anthropological Society of Paris an undoubted Celtic character for the one, while the other is compared by Lyell with "the highest or Caucasian type."

With the demand for this new class of facts, the mode of presenting them in the most accessible, trustworthy form, acquires an importance unthought of till now. A cast is, of course, the nearest approximation to the original; but this is costly, cumbrous, and only available to a select few. The oldest of all methods, that of the pencil, can not be lightly undervalued. It is due to the labors of the Egyptian draftsman that we know beyond all question of the existence of race types of widest divergency, nearly three thousand seven hundred years ago; and that the race which still differs most markedly from the European type has undergone no change during all that lapse of time. With results of such value traceable to the art of the old Egyptian painter, we are not likely to underestimate its enduring worth; and the appeal

to the eye afforded by engraving and wood-cut is abundantly appreciated by the modern anthropologist. By means of an accurate pencil, with the economical facilities of the wood-engraver, the most characteristic specialities of race, in physiognomy, form, or arts; or the distinctive peculiarities of any well-marked cranium: are easily reproduced, and introduced as part of the text.

Yet even this time-honored method, though it has stood the test of ages in a way none other has done, is not absolutely to be relied on. There is always a danger, on the one hand, of the draftsman slighting the essential niceties of detail, and so losing the most characteristic features; or, on the other hand, of the enthusiastic theorist exaggerating supposed typical characteristics; or imagining in the object of his study the preconceived features he is in search of.

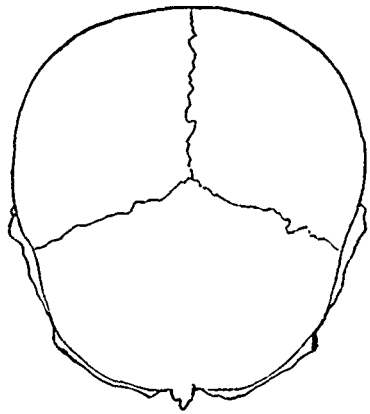
The history of the "Scioto-Mound skull,"—most remarkable among the crania of the American "Mound Builders,"—supplies an interesting illustration of the difficulties attendant on graphic representation of type-forms. The first volume of the "Smithsonian Contributions to Knowledge," in which Messrs. Squier and Davis presented to the world the fruits of their researches among the mounds of the great Mississippi valley, is illustrated with so much artistic skill, that the reader might not unreasonably repose implicit faith in their views of the remarkable skull, produced in evidence of the physical characteristics of the race, to whose monuments and art-workmanship the volume is devoted. The idea of a pre-Indian race, of a higher type, and superior mechanical and artistic skill to the forest-tribes of the New World, had a charm surpassing that of the rude Troglodytes and Flint-folk of Europe's prehistoric ages; and hence "the counterfeit presentment" of the old Mound Builders has left an impression on the American mind, not likely to yield to anything but the most incontrovertible evidence conflicting with the theories for which it has furnished a basis.

Apart from any theory, it is a remarkable example of a cranium of extreme brachycephalic type, approaching very nearly to a correspondence in length, breadth and height; and is justly prized as one of the most valuable objects in the Morton Collection of the Academy of Sciences at Philadelphia. Its facial angle, internal capacity, and most characteristic measurements, are recorded by Dr. E. H. Davis, and have been repeatedly turned to account in discussing the significance of this interesting discovery. When brought into comparison with corresponding measurements of a skull of markedly dolichocephalic propor-

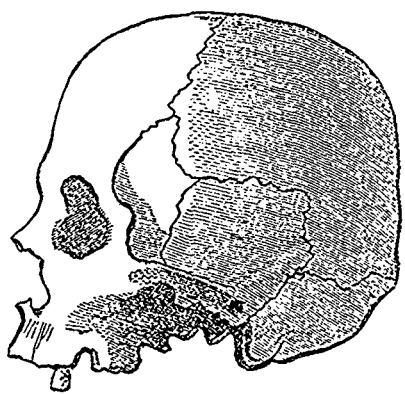
tions, such as the Negro type; or even with the native Iroquois cranium: the contrast is very striking. But Professor Huxley, when discussing the results of a similar comparison of the proportions of an English skull, noted in the catalogue of the Hunterian Museum as typical Caucasian, with that of the Engis cave, remarks that they only serve to show "that cranial measurements alone afford no safe indication of race." He therefore resorts to the pencil, supplementing the metrical test by a series of outlines of typical skulls placed in juxtaposition, and thereby aims at a more reliable demonstration. Nor can it be doubted that, where available, drawings, measurements and description, employed in combination, are needed to supply an adequate substitute for the original.

But the value of any system of measurement consists in its easy application, and equally ready reproduction; so that if its results can be rendered specific and determinate, they are available to an extent far beyond any other means of comparison; and are nearly free from chances of error such as affect the draftsman's labors. This is abundantly illustrated by the Scioto-Mound skull. A minute comparison of Messrs. Squier and Davis's lithographs with the original reveals important discrepancies, which in no degree affect the accompanying measurements. After carefully comparing the skull with the views in question, I satisfied myself that the vertical view—so important for comparative purposes,—is specially inaccurate. In the original the peculiar characteristics of what I have elsewhere designated the truncated occiput, is seen in its extremest development, passing abruptly from a broad, flattened occipital region, including the posterior portion of the parietal bones, to the greatest parietal width, and then tapering, with slight lateral swell, until it reaches its least breadth immediately behind the external angular processes of the frontal bone. This remarkable parieto-occipital flattening has been produced, I conceive, by the use, in infancy, of the cradle-board, but without any pads or bandages affecting the forehead. The frontal bone is unusually high and well-arched; and hence I infer that the occipital modification has resulted without any purposed aim at a change of form, as in the case of the Flathead Indians. It illustrates the effect of persistent and greatly prolonged pressure on the occipital and parietal bones, in one direction, acting on a head naturally of extreme brachycephalic proportions and great posterior breadth. The views here given of it, vertically and laterally, have been executed from the original with

considerable care;* and while they serve to indicate some important



SCIOTO-MOUND SKULL:—VERTICAL VIEW.



SCIOTO-MOUND SKULL:—LATERAL VIEW.

peculiarities, either omitted or inaccurately presented in the engravings

*The wood-cuts, originally executed to illustrate an abstract of Lectures on "Physical Ethnology," delivered by me at the request of the Regents of the Smithsonian Institution, at Washington, in 1862, have been kindly placed at my service by Professor Henry.

referred to; they also illustrate the uncertainty which must pertain to the most careful reproduction of typical forms by means of the pencil. Comprehensive deductions as to the characteristics of the supposed precursors of the Red Indians in the great river valleys of North America, have been based on the assumption—rendered all the more reasonable by the general skill and accuracy of Messrs. Squier and Davis's illustrations,—that the well-executed lithographs of the Scioto-Mound skull did correctly represent the original.

Seeing, then, the liability of the most artistic drawings to fail in scientific accuracy, it becomes obvious that if a system of measurements can be determined and generally adopted, capable of producing results available as a test of comparative cranial form, it will prove alike easier in its application, and more trustworthy, than the pencil. The photographic art, so reliable in many respects, has indeed come to our aid, and greatly facilitates the production of truthful drawings, but it does not solve all the difficulties in question, owing to inevitable exaggeration of the nearer points, and consequent misrepresentation of relative proportions on which so much depends.

The *Crania Britannica* is an example of the illustrative process applied with a degree of skill and accuracy that could scarcely be surpassed; but the result is very costly, and consequently limited in the number of examples illustrated; whereas ethnical deductions, to be of much value can scarcely be founded on too many observations. Whatever system, therefore, is simple, free alike from costly application and liability to error, and sufficiently definite in character to make its results, so far as they go, precise and definite, will best satisfy the aims of the comparative craniologist: and those the test of measurement professes to supply. But even if a metrical system be admitted to embrace more certainly than any other, the requirements here specified: the question still remains undetermined, what are the most useful measurements for giving expression to the specialities of head-forms. No detailed system has yet obtained universal acceptance; and hence the value of some important contributions to science is diminished, owing to the impossibility of bringing the results of different observers into comparison. Looking to the growing interest which attaches to this subject among Anthropologists, I have more than once proposed giving publicity to the early labours of a deceased friend in the department of craniometry, under the belief that the elaborate minuteness of detail adopted by him embodies some valuable suggestive

hints; but the distaste of editors—not to speak of readers,—for columns and tables of measurements has as often deterred me.*

Among a group of fellow-labourers in the investigation of Scottish archæology, whose memory I now recall with many pleasant associations and vain regrets, was the late Dr. Walter Adam, a gentleman of liberal tastes and accurate scholarship.† I was indebted to him for coöperation in various investigations, both literary and antiquarian; and when engaged, in the years 1849 and 1850, in collecting and minutely studying ancient Scottish crania, with a view to determine various points, since discussed in the "Prehistoric Annals of Scotland," and subsequent publications: Dr. Adam put into my hands a series of measurements of French crania taken under the following circumstances. After enjoing the advantages of pursuing his studies under the care of the distinguished anatomist, Dr. Barclay, and completing the requisite course for his degree in Medicine in the University of Edinburgh, he spent some time at the medical schools of Paris. Dr. Spurzheim, the favorite pupil, and later associate of Dr. Gall, the founder of the system of Phrenology, was at that period lecturing in the French capital, and winning the attention of many enthusiastic students by the novelties of the new science he promulgated. From 1807 to 1813 Gall and Spurzheim lectured conjointly on their favourite subject to Parisian audiences, and thereby trained many followers by whom their opinions were spread throughout Europe. Dr. Adam was fascinated for a time by the attractions of the lecturer, as well as the seductive promises of the science; and bringing its principles to bear in the direction of his own national predilections, he proceeded, under the guidance of Dr. Spurzheim, to select from a series of skulls in the University Museum, recovered from the Parisian Catacombs, a group illustrative of the Celtic head.

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* An abstract of the series of measurements referred to, prepared as a supplement to the "Inquiry into the physical characteristics of the ancient and modern Celt," (*Canadian Journal*, Vol. IX.), to which, as will be seen, it had a fitting bearing, was omitted, owing to the length of that paper. The present paper originated in a renewed attempt at their publication; but I have been compelled to limit myself to very brief selections, after preparing the whole tables for the press.

† Dr. Walter Adam, Fellow of the Royal College of Physicians of Edinburgh, and a member of various learned Societies, was a son of Alexander Adam, LL.D., Rector of the High School of Edinburgh, author of the "Roman Antiquities," and other works. He died in 1857.

Here it is obvious that the great German craniologist undertook the same problem of ethnical classification which, in our introductory remarks, has been applied in theory to an early frontier cemetery of the New World. But the problem becomes enormously complicated, when brought to the test in some great common bivouac of the nations, such as Paris has been through so many centuries, to Gaulish, Roman, Merovingian and Carlovingian Frank, Norman, and English occupants. Though the predominance of the Celtic element in the modern French is universally admitted, Paris is the least likely to yield evidence of its persistency; and reasoning *a priori*, it would be difficult indeed to determine the probable classification of any chance skull recovered from the Parisian Catacombs.

On what principle Dr. Spurzheim and his disciple did determine the celticity of these Parisian Crania I failed to ascertain. The interval which had elapsed since Dr. Adam pursued his cranial and phrenological investigations, under such a mentor, had greatly cooled his ardour; and the note with which he accompanied the gift of his elaborate tables of measurements, after discussing other subjects of mutual interest, concludes with the remark: "You are welcome to light your fire with all about the Parisian Catacombs." Aware, however, of my friend's painstaking and accurate habits of observation, and the peculiarly favourable opportunities he enjoyed for such investigations, I carefully preserved the fruits of his labours as an interesting contribution to minute craniometry. He remarks of them: "The series of external measurements of Parisian crania were taken from skulls selected by Dr. Spurzheim, from a number in the museum of the University, as most illustrative of the Celtic French head. They will show you, I think, every possible measurement of the human cranium. In regard to the phraseology: in one respect, like Professor Owen, I had the benefit of the instructions of Dr. Barclay, and also of Mr. Abernethy. The side-numbers refer to the crania themselves, in the University museum. So far as appeared, precision could be attained only by referring every dimension to the compression of the zygoma, the measurement being seven-eighths of what I consider the normal transverse of at least the Caucasian cranium,—that is half the length of the head,—the long admitted statuary scale."

It thus appears that, in aiming at an exhaustive system of craniometry, Dr. Adam combined the practical experience of Dr. Spurzheim with the teachings of the eminent Scottish anatomist, Dr. John Barclay, and

of Dr. Abernethy, the no less distinguished surgeon. The measurements finally adopted by him amount in all to seventy,—or more strictly to sixty-nine: No. 6 being left blank in the tables received by me. They furnish evidence of laborious industry, and are necessarily of a very comprehensive and minute character. Of their practical utility it is obvious that Dr. Adam latterly entertained grave doubts. But his industry had then been diverted into wholly different channels; and his faith in the special teachings of Dr. Spurzheim had long passed away. It is more important for us to note that he retained full faith in the tables embracing all that the craniometrist aims at. Lest, however, the remark quoted from a private note, that "they show every possible measurement of the human cranium," and so achieve the desideratum of an exhaustive metrical system, should suggest a false idea of the writer, it will not be out of place to add that Dr. Walter Adam partook largely of the modest and amiable virtues ascribed to his father. He was sensitive and retiring in his habits; and the decided terms here expressed are highly characteristic of his simple sincerity. His minute and somewhat formal accuracy, even in trifles, renders his detailed proportions of Parisian crania worthy of the utmost confidence; though it will not admit of literal acceptance that they embrace "every possible measurement."

Whatever opinion the modern Anthropologist may form of the neglected system of Gall and Spurzheim, no doubt can be entertained as to the services rendered by them in his special department of study. The practical failure of their system of an assumed index of the "phrenology" or mental characteristics of each individual, impressed on the surface of the skull, and representing certain supposed brain-organs of the mind, need not blind us to the valuable results of their labours in other directions, and especially in that of comparative craniology.

Infinite as are the varieties of individual physiognomy, there is, nevertheless, a national type of face, difficult indeed to define, yet recognisable at a glance; and so also, amid endless deviations from any supposed national head-form, the hatter, in adapting his manufactures to different localities finds the variations from the common type of each range within comparatively narrow and constant limits. Assuming, then, the significance of diverse cranial conformations, and of certain relative proportions in the heads of different races, as indices of ethnical distinctions, various metrical tests have been suggested. Drs. Scherzer and Schwarz, who accompanied the Austrian exploring expedition in

the ship Novara, devised an elaborate system applicable to the whole human figure, "as a diagnostic means for distinguishing the Human Races," and including thirty-one measurements of the head. By this means they aimed, and as they believed, successfully, at determining a system adapted to the classification of men according to race-differences. But so many difficulties beset the craniometrist, in the uncertainty as to determinate points, of uniform occurrence, from which to start in the various measurements; and deviations from any assumed normal arrangement in the direction and relative position of the sutures are so numerous, that: while one class of modern observers still aims at overcoming those sources of error by multiplying the details of measurement; the greater number—feeling somewhat as Dr. Adam did, the difficulty of interpreting the results of such minute labour,—incline to fall back mainly on the earlier and simpler tests of length, breadth, height, circumference, and internal capacity.

Of the former class, Dr. J. Aitken Meigs merits special recognition. After a careful resumé of the labours of his predecessors, he has set forth in "The North American Medico-Chirurgical Review" for September, 1861, an elaborated scheme of cranial admeasurements, with minute indications as to the fixed points on which each depends. Including the face, and such special details as the diameters and shape of the foramen magnum, Dr. Meigs' measurements amount in number to forty-eight. Among observers who have limited themselves to the few most notable calliper and tape measurements, Drs. Thurnam and Davis may fitly represent this second class. In their beautifully executed "Crania Britannica" they have only made some slight, though not unimportant additions to those employed by Dr. Morton, in the "Crania Americana:" relying, in part, on the pen for completing the work, by means of descriptive details; but still more on wood-cuts and full-sized lithographs. The plan of Dr. Spurzheim—like those of Drs. Scherzer, Schwarz and Meigs,—appears to have contemplated an exhaustive metrical system complete in itself.

But Dr. Adam claimed to have embodied in his labours on the crania of the Catacombs the results of instruction derived from Barclay and Abernethy, as well as from Spurzheim The nomenclature and measurements, therefore, employed by him, under the special direction of the distinguished Parisian lecturer, cannot be wholly devoid of interest to the modern anthropologist, and may furnish suggestions of practical value. They are classified as follows:

Measurements in the Mesial plan, (External rectilinear).

I. Inio-glabellar measurements. 1. From inion to glabella. 2. From inion to fronto-nasal suture. 3. To centre table of frontal sinus. 4. From coronal process of occipital bone to naso-alveolar sinuosity. 5. Os frontis, mesially. 6. (*blank*).

II. Measurements from inial margin of foramen spinale. 7. From the inial margin of the foramen spinale to the coronal point of the occipital bone. 8. —to meeting of the coronal and sagittal sutures. 9. —to furthest point of os frontis. 10. —to fronto-nasal suture.

III. Measurements on the mesial plan. 11. From glabellar margin of foramen spinale to coronal point of occipital bone. 12. —to coronal point of sagittal suture. 13. —to meeting of coronal and sagittal sutures. 14. —to fronto-nasal suture. 15. —to latero-glabellar margin of right nostril. 16. —do. of left nostril. 17. —to naso-alveolar sinuos. 18. —to inial sinuous margin of palatal bones.

IV. Measurements parallel to the mesial plan. 19. From fronto-nasal suture to glabellar margin of floor of right nostril. 20. Do. of left nostril. 21. From basilar margin of right orbit to sinuous surface of right coronal maxilla. 22. From do. of left orbit to do. of left coronal maxilla. 23. From latero-glabellar sinuous margin of right nostril to inial surface of right coronal maxilla. 24. Do. left to left do. 25. From glabellar surface of right zygomatic enclosure to inial surface of right stylo-mastoid foramen. 26. Do. left to left do.

V. Oblique measurements. 27. Cranium, from right fronto-malar suture to furthest point of left parietal bone. 28. Do. from left to right do. 29. Face, from inial sinuous margin of right malar bone to latero-glabellar sinuous margin of right nostril. 30. Do. from left to left do.

VI. Transverse Basilar measurements. 31. Distance between lateral surfaces of stylo-mastoid foramina. 32. Between lateral surfaces of carotid canals. 33. Do. mesial do. 34. Do. lateral surfaces of foramina ovalia. 35. Do. mesial do. 36. Do. lateral surfaces of cuneiform process of os occipitis glabellar.

VII. Transverse Temporal measurements. 37. Distance between peripheral surfaces of mastoid processes. 38. Do. inial prolongations of zygomata. 39. Do. auditory ridges. 40. Do. peripheral surfaces of zygomata. 41. Do. central edges of zygomata.

VIII. Transverse Parieto-coronal measurements. 42. Distance between lateral surfaces of parietal bones. 43. Do. of squamous sutures,

coronad. 44. Do. inial margins of os frontis at coronal suture. 45. Do. lateral ridges of os frontis. 46. Do. orbital processes of os frontis.

IX. Transverse Facial measurements. Fronto-orbital. 47. Distance between fronto-malar sutures on margins of orbits. 48. Do. between mesial surfaces of orbits at fronto-nasal suture. 49. Do. between do. at lateral surfaces of nasal processes of coronal maxillæ.

Malo-maxillary. 50. Distance between inial sinuous margins of malar bones on line of middle of orbit. 51. Do. most prominent edges of lateral margins of orbits. 52. Do. lateral edges of orbito-maxillary foramina. 53. Do. between malo-maxillary sutures, basilar and glabellar. 54. Do. lateral surfaces of alveoli of coronal maxilla. 55. Do. lateral surfaces of palatal foramina.

X. Measurements of Appertures. Orbits. 56. Distance between frontal and maxillary margins of right orbit in direction of mesial plane. 57. Do. of left do. 58. Obliquely between fronto-mesial and malo-basilar sinuosities of margin of right orbit. 59. Do. of left.

Nostrils. 60. Distance transversely between mesial surfaces of glabellar sinuous margins of nostrils. 61. Do. of inio-palatal margins of nostrils.

Foramen spinale. 62. Distance between glabellar and inial margins of foramen spinale. 63. Do. between lateral margins.

64. Periphery of os frontis in mesial plane from fronto-nasal to coronal suture. 65. Do. of sagittal suture. 66. Do. of os occipitis in mesial plane from termination of sagittal suture to inial margin of foramen spinale.

67. Periphery of cranium from fronto-nasal suture to inial margin of foramen spinale. 68. Do. to glabellar margin.

69. Transverse periphery of cranium at right angles to mesial plane, between coronal surfaces of meatus auditorii.

70. Transverse periphery of cranium on level of orbital processes of os frontis and most inial point of os occipitis.

Such are the minute details in the system of cranial admeasurements adopted by Dr. Adam, under the guidance of his experienced instructors.

The principle which guided him in the course he pursued is further illustrated by the remark: "It is abundantly evident that, before proceeding to curvature, there must be accurate ascertainment of the abscis and ordinate." Hence the numerous transverse measurements introduced. But he retained to the last his faith in the assumed "statuary scale;" and, in discussing the views set forth by the late

Mr. D. R. Hay, in his "Science of those proportions by which the human head and countenance, as represented in works of ancient Greek art, are distinguished from those of ordinary nature," he says: "My impression is that Mr. Hay is quite correct; and I am led to it not less by the elegance of his outlines, than by the fixity of my said 40, (distance between peripheral surfaces of zygomata,) the measurement being seven-eighths of what I consider the normal transverse of at least the Caucasian cranium." But, he adds, "I have no thought of relying on the method of averages;" and so he has not deduced any mean results of the measurements, otherwise carried out with such laborious accuracy, for the purpose of determining the characteristics of crania from the Catacombs of Paris, selected apparently, by Dr. Spurzheim, as the most typical examples of pure Gaulish or Celtic head-forms. Like many another labourer in the same field of observation, Dr. Adam failed to discover the precise application of his metrical system either for ethnical or psychological purposes; and when, long afterwards, his carefully executed tables were handed over to me, it was as fruits of early labour chiefly designed to aid him in researches into the assumed relations of mental and cerebral development, and which he had ceased to regard as of practical utility.

From the comprehensive series of measurements, arranged under the above heads, I have here selected such as will afford an opportunity of comparison with tables already furnished in former papers: and especially with those produced as some means of testing the characteristics of the British or Celtic cranium. They are taken as indicating the greatest circumference, length, parietal and frontal breadth, and also the zygomatic diameter to which Dr. Adams assigned so much importance, as the test of approximation to an ideal classic standard, or accepted statuary scale. The differences in specific points selected for determining some of the measurements must be borne in remembrance in instituting any comparison with previous tables. They are as follows: A. (4.) From coronal process of occipital bone to naso-alveolar surface. B. (5.) Os frontis mesially. C. (42.) Distance between lateral surfaces of parietal bones. D. (37.) Distance between peripheral surfaces of mastoid processes. E. (40.) Between peripheral surfaces of zygomata. F. (70.) Transverse periphery on level of orbital process of os frontis and most inial point of os occipitis.

MEASUREMENTS OF PARISIAN CRANIA.

No.	Sex.	A (4)	B (5)	C (42)	D (37)	E (40)	F (70)
1		7.53	4.45	5.17	4.36	4 81	" "
2	M	7.70	4 70	6.07	5.02	5.33	21.00
3		7.55	4.00	5.00	4.40	4.85	20.75
4	M	7.42	4.45	6.23	4.90	5.33	20.56
5	M	7.40	4.46	6.10	4.66	5 33	20 50
7	M	7.84	4.38	5.83	4.90	5.14	21.00
8		6.70	3.94	5.44	4.22	4.52	18.50
9	M	7.55	4.60	5.90	5.05	5 32	20 00
12		6.90	4.16	5.52	5.10	5.03	19.15
13		7.30	4.30	5.73	4.66	5.04	20.37
15		6.97	4.14	5.41	4.64	4.50	19.00
16		7.47	4.52	5.93	4.70	" "	20.50
22		7.30	4.40	5.44	4.70	4.84	19.75
23	M	7 63	4.64	5.62	4 65	5.26	20.62
25	M	7.58	4.40	6.03	5.30	5.46	20.87
26		6.90	4.20	5.58	4.63	5.04	19.12
27	M	7.20	4.36	6.01	5.30	5.60	20 87
29	M	7.30	4.26	6.03	5.06	5.12	20.62
31		7.40	4.20	5.50	4.86	4.93	20 90
32		7.67	4.34	5.08	4.72	4.88	20.12
34	M	7.27	4.57	5.80	4.75	4.95	20.18
36	M	7.32	4.62	6.02	5.07	5.23	20 50
37	M	6.94	4.33	5.92	5.30	5.28	19.81
38		7.92	4.60	5.26	4.63	4.91	20.87
39	M	6.95	4.22	5.66	4.65	4.83	19.50
40		7.50	4.20	5.02	4.40	4.64	19.50
41	M	7.40	4.24	5.76	4.80	4.96	20.06
50	M	7.36	4.54	5.97	5.27	5.52	20.31
Mean.	Male.	7.391	4.451	5 .3)	4.979	5 244	20.427
"	Female	7 316	4.265	5.390	4.617	4.832	19.802
".	Total.	7.356	4.365	5.680	4.811	5.061	20.149

The crania subjected to measurement number twenty-eight in all, of which fifteen are marked as male; and the remainder may be assumed, without doubt, to be female. In the tables of Dr. Adam they are systematically arranged throughout in the two sets, irrespective of their numerical order. The larger group, embracing fifteen, begins with No 37, and the first column is thus headed: "Crania as numbered, and

the sex denoted by Dr. Spurzheim." In the other group of thirteen crania, as exhibited on a separate series of sheets, the corresponding column is left blank; but a comparison of the two groups of measurements, and of the total mean proportions of each, adds confirmation to the assumption that a nearly equal number of male and female skulls had been selected, with a view to determine more accurately the typical characteristics common to the race. The means of determining this, as well as other points that may suggest further inquiry, are, in all probability, still accessible to Parisian craniologists.

Other columns have been ruled, and some of them headed, though they remain otherwise blank. They help to illustrate the minutely exhaustive process aimed at, *e. g.* "From fronto-nasal suture to glabellar margin of right nostril." "Do. to glabellar margin of left nostril." "From latero-glabellar sinuous margin of right nostril to inial surface of right coronal maxilla." "Do. of left, to inial surface of left." The peripheral, or tape measurements, have also been originally projected on a much minuter scale, judging from the number of columns left blank under the general heading; but those of most importance are recorded. The head-lines of unfilled columns also include the following: "Apparent age;" "Apparent strength of the individual:" "Form;" "Outline of foramen spinale;" and—specially suggestive of the phrenological impetus to which the whole measurements were originally due,—this heading: "Character, according to Dr. Spurzheim."

The loss of Dr. Spurzheim's inductions relative to the mental characteristics of the old sleepers in the Parisian Catacombs, as derived from external protuberances of their crania, is not greatly to be deplored. A point of more interest at the present time is happily recorded for us, in so far as measurements supply any clear indication of head-forms. The question of the typical form and proportions of the Celtic cranium has already been minutely discussed in this journal. The "Inquiry into the physical characteristics of the ancient and modern Celt" attracted some notice at the time of its publication; was quoted in more than one European journal, and reprinted entire in the London *Anthropological Review*. After drawing attention to one frequent source of error traceable to the neglect of this fact that a type, as an ideal abstraction, embodying the characteristics of both sexes, and embracing the mean of many variations, must not be determined from one or two selected specimens: it was there shown that many of the

highest authorities among modern comparative anatomists and ethnologists have given publicity to opinions all pointing more or less definitely to an excess of longitudinal diameter, and an unusually long but low frontal development, as among the most marked characteristics of the Celtic cranium.

In this, recent observers only confirm from more extended investigation, opinions advanced at an early period, including those of Prichard and Retzius. But other high authorities have shown an inclination to challenge such, as conclusions resting on no satisfactory evidence. Dr. Thurnam, in the *Crania Britannica*, quotes the distinguished Swedish naturalist and archæologist, Professor Nilsson, as stating in a letter to him, in reference to the supposed Celtic type of cranium, that nothing seemed to him more uncertain and vague than that term; for, he says, *hardly two authors have the same opinion on the matter.* He accordingly urges on his correspondent the desirableness of some one in England undertaking the selection of a skull embodying what those enjoying the special advantages which he assumes to pertain to that country, shall agree upon as constituting the Celtic form of cranium. Of this he proposes that casts shall be taken, and so a type-form of the race be determined.

Although the statement of the Swedish naturalist as to an utter want of agreement relative to the typical characteristics of the Celtic cranium, can by no means be admitted; his requirement has not only been long felt as a desideratum, but repeated attempts have been made to realise it. And here we are reminded of our obligations to phrenology; for foremost among those who have laboured with this object in view stand its founders and early disciples. The observations of Dr. Adam on the crania of the Parisian Catacombs serve to illustrate some of the researches conducted by Dr. Spurzheim with this object in view; and other no less definite evidence shows that the zealous phalanx of British phrenologists called into being by the teachings of Dr. Gall and his collaborateurs, followed his example, and systematically aimed at determining the characteristics of the Celtic, as well as other leading ethnical types. Certain crania and casts are referred to in the *Phrenological Journal* as selected from a number of the same tribe or nation, so as to present, as nearly as possible, a type of the whole, in the collection of the Edinburgh Phrenological Society; and among them is a cast marked as a "Long Celtic skull." It is no less noticeable for narrowness than length; and especially for the elongated, narrow frontal region,

now accepted by many French and English anthropologists as a characteristic feature of the true Celtic head-form.

Assuming the race assigned to the Parisian Crania to be correct, the idea thus indicated finds some apparent confirmation from the measurements now produced. Derived as those are stated to have been, from the Catacombs of Paris, they might indeed, if selected from among the contents of that vast charnel-house as characteristic of the prevailing form to be found there, be fairly assumed as representing the typical French head. But as illustrations of the Gaulish or French-Celtic head-form, as contra-distinguished from Iberian, Burgundian, Frankish, Norse, or other type, their value depends wholly on the grounds of selection. But of these, unfortunately, we have no record; and can only surmise that Dr. Spurzheim had already satisfied himself that the long skull, with narrow frontal region, was the true Celtic one. Certain it is that some such preconceived idea must have guided him when selecting crania from the great Parisian golgotha, in order that his Scottish disciple might gratify his natural predilections, while devoting himself to the mastery of the laws of mental idiosyncracy as indicated in the development of assumed cerebral organs, and the consequent modification of the osseous brain-case. Nor can we wisely allow the rejection of his favourite dogmas to prejudice us against the purely craniological observations of one whose opportunities were only equalled by his diligence in the study of individual and ethnical diversities.

Dr. Johann Gaspar Spurzheim studied in the University of Treves, near to which he was born, pursued his medical studies and graduated at Vienna, lectured in different cities of Germany, Prussia, Denmark, France and England; revisited Paris, and resided as a lecturer there from 1817 to 1825, when he returned to Britain. All the events of his age were calculated to suggest more strongly to his mind the existence of essential ethnical differences between the true German and the descendant of the ancient Celt of Gaul; but nothing in his peculiar views as a phrenologist tended to bias his opinions in favor of a long, rather than a short Celtic head-form.

But, strangely enough, after the lapse of more than half a century, the right of property in this idea of long-headed Celts, with other questions of a kindred type, has been brought into Chancery, and adjudicated upon in that high court of appeal: with results in which we may perhaps be allowed to claim some interest. In 1866 there issued from the press of Messrs. Longman & Co., the well-known

London publishers, a work already referred to, by Mr. Luke Owen Pike, entitled "*The English and their Origin. A Prologue to Authentic English History.*" Mr. Pike, a graduate of Oxford, and member of Lincoln's Inn, has devoted himself to literary and scientific pursuits; and specially taken an active part in the Anthropological Society of London, of which he is a Vice President. His "Origin of the English" attracted considerable notice, was reviewed in various leading journals; and so, as would seem, tempted a literary rival, who had already contested the palm with him at the Eisteddfod of their common Welsh nationality, to follow in his steps with his "*Pedigree of the English People.*" But the latter presented, in certain parts, so near a resemblance to its predecessor, not only in language, method and argument, but even in such errors as the most painstaking author is liable to, that the literary barrister summoned his rival before Vice-Chancellor James, on the 27th of April last, for having, in plain terms, stolen his ideas, his arguments, quotations, references, and even his very blunders, and made open merchandise of the whole as his own.

It must be admitted that the defendant cuts a very sorry figure in court. Though we propose to have a word to say, before closing, in reference to certain claims of priority and originality set forth on Mr. Pike's behalf: there is no doubt that his work was the honest result of much labour and research, handled in a scholarly manner; and with no other than the legitimate aims of authorship in view. As to his rival, he is a Doctor of Philosophy; conversant at least with the Welsh language; and Professor, in Carmarthen College, not only of German, but of Ecclesiastical History, Mental and Moral Science, and General Literature. But notwithstanding such a comprehensive profession, his classical knowledge does not seem to have stood him in good stead. The property in certain criticisms in dispute between plaintiff and defendant, relative to Gildas, the old historian, of the sixth century as is believed, brought the latter's name prominently into court. But the defendant, it seems, only knew him through Bohn's translation; and is indeed quoted in court as stating that "Gildas copied Bede," though the venerable monk of Jarrow, whose labours are thus affirmed to have been turned to account sometime towards A.D. 550, belongs as a historian to the eighth century. The plaintiff's counsel drew from him the admission that he resorted to Bohn's edition "because he felt diffident of translating the Latin himself." His own counsel, more bent on winning his cause, than careful of his client's scholarly reputation,

asserted for him, at a later stage, in accounting for the true reading of a much contested erasure: "The fact is, my client's book shows in many places that he had a most imperfect knowledge of Greek, and I believe did not know how to spell the word *physiological*." No wonder, therefore, when Mr. Pike, in quoting from Livy about the *rutilatæ comæ*, or reddened hair of the Galli, fell into an error, his hapless imitator—as is the way with such poachers on literary preserves,—transferred it, blunders and all, to his own pages. So, after prolonged trial, and much argument on both sides, the Vice-Chancellor decided that the plaintiff had made out his case, and was entitled to an injunction to restrain the publication of his rival's book; to a refunding of all money already obtained by its sale; to costs of suit; and, in fact, to all "the damages in cases of literary piracy."

This trial has, not unnaturally, excited considerable interest in literary circles. Mr. Grove, Q.C., late President of the British Association, was Mr. Pike's leading counsel; Dr. Beddoe, President of the Anthropological Society of London; its Honorary Secretary, Mr. C. Carter Blake, Lecturer on Comparative Anatomy at Westminster Hospital; Dr. Rowland Williams; Mr. Watts, of the British Museum Library, and others: appeared as witnesses; and the Court had to listen to citations from Livy, Gildas, Pouchet, Retzius, Prichard, Blumenbach, and other authorities not usually supposed to carry weight in Chancery suits. We now propose to advert to one or two points in which readers of the *Canadian Journal* may claim some interest. Mr. Kay, Q.C., one of the defendant's counsel, in cross-questioning Mr. Pike, as to the uses made by him of other authorities, asked "whether he had not found the idea of getting information from hatters in Professor Wilson's paper, published in the *Anthropological Review?*" His answer is, that the paper in question appeared in 1865, while certain letters produced in court in proof of his researches on the same subject, bore the date of 1864. But, he states, "after seeing Professor Wilson's paper, he added a note to what he had previously written, and mentioned this agreement in method, with Professor Wilson's name."

The idea of making the hat a test of the form and size of the head is one so simple and obvious, that it would be childish to attach any great merit to its first application for the purpose. When the mausoleum of the poet Burns was opened in 1834, for the interment of his widow, some little scandal was created by a Dumfries Bailie trying his hat on the poet's skull, and publishing to the world the modest truth

that his own cerebral capacity, when gauged by this simple process, fell considerably short of that of the Ayrshire bard. When, however, dates are thus specifically assigned to our first publication, we may be pardoned correcting them.

The paper referred to in the evidence above quoted, is the "Inquiry into the physical characteristics of the ancient and modern Celt," which appeared in the November number of the *Canadian Journal* for 1864. It was forwarded, as usual, to the Anthropological and other Scientific Societies of London and elsewhere; in addition to author's copies posted to English correspondents and friends: and in this way was transferred to the pages of the *Anthropological Review*. I might refer to earlier dates at which the subject was brought before the Canadian Institute; but it is sufficient that my views on this subject were published in 1864, and soon after attracted notice both in London and Paris; and among those are ideas of more importance in their bearing on the general question than the one referred to in Mr. Owen Pike's note.

The Honorary Secretary of the Anthropological Society, Mr. C. Carter Blake, when questioned by the defendant's counsel, made this reply: "He believed the fact that the modern English possess long skulls was first established by the plaintiff, (Mr. Luke Owen Pike), and that he had first combined the propositions that the Celtic skull was long, that the Teutonic skull was short, that the modern English skull is long, and that therefore, the English are descendants of the ancient Britons. That was perfectly new."

Now we venture to question whether that was perfectly new. Mr. Pike says, in answer to the defendant's counsel: "He believed his argument concerning the skull-form of the English, in relation with the skull-forms of the ancient and modern Teutons, and of the ancient and modern Celts, to be original. He had arrived at it by a long process of sifting evidence which was very contradictory." But we had arrived at results, in many respects similar, after sifting much conflicting evidence: as set forth in the "Inquiry into the physical characteristics of the ancient and modern Celt," published in this journal in 1864, whereas Mr. Pike's "*English and their Origin*" did not appear till 1866. We cannot, indeed, do better than quote Mr. Pike himself in proof of this. In discussing the relative proportions of the average German and English head, he refers to the uniform experience of the hat manufacturer; and then adds, in the note already referred to:

"Since this portion of the Essay (*i. e.* his, *English and their Origin*) was written," the above named paper has appeared in the *Anthropological Review*. "It fully confirms all that has been above stated with respect to the difference between English and German heads." Mr. Pike's reference is equally candid and courteous; and we should not have thought of pointing out that the confirmation of opinions already published in 1864, must be ascribed to him, not to us, were it not for such absolute claims to novelty and originality, incident, perhaps, to the necessities of a Chancery suit. But our first appeal to the special test referred to is of much earlier date, and then explicitly refers to the very point in question, viz., the contrast between the short German and long British head. For example, in treating of "Ethnical forms and undesigned artificial distortions of the Human Cranium," (*Can. Jour*, Vol. VII., p. 414, Sept., 1862), it is remarked: "My attention was originally directed to this familiar test [viz., hat manufacturers' shapes] by a remark of the late Dr. Kombst, that he had never been able to obtain an English-made hat that would fit his head. He added that he believed such was the general experience of Germans, owing to the greater length of the English head. I subsequently found the shapes of a Yorkshire hatter to be shorter than some furnished me from Dublin; and I believe that such comparisons of the shapes most in demand in different parts of the British Islands and on the Continent, will supply important craniological results. Dr. Nott has employed the same means in his 'Comparative Anatomy of Races,' but only as a test of relative horizontal circumference."

Again, in the later paper of 1864, this occurs: "One extensive hat manufacturer in Edinburgh states that the Scottish head is decidedly longer, but not so high as the English. In comparison with it the German head appears almost round."

When Mr. C. Carter Blake set forth in evidence, as one of Mr. Owen Pike's contributions to ethnology, the deduction that "The English are descendants of the ancient Britons," it is to be presumed that he meant no more than Mr. Pike himself repeatedly indicates, namely, the predominance of the British as compared with the Anglo-Saxon element. He remarks, for example, (*English and their Origin*, p. 46), "We know from the laws of Ine, that there was a British population dwelling among the Saxons, and that its position was not very inferior to the position of the Saxons themselves. But in addition to these Saxonised British landowners, there must have been a considerable

number of captives belonging to the Lloegrian and other British tribes, all of whom helped to increase the proportion of British as compared with Saxon blood. And still further there must have been a number of Saxo-Britons of the half-blood, some at least of whom would have the full privileges of Saxons." Again he says: (*Ibid*, p. 165) "It cannot be so readily admitted that the longer skulls belonged to the Anglo-Saxons of pure breed. Many of them are the skulls of women, who may have been the British wives of Saxon settlers. Without confirming evidence of some kind, it cannot be allowed that a skull found in an Anglo-Saxon burying-place is the skull of an Anglo-Saxon of pure blood." So writes Mr. Pike, in 1866; but in 1863, in discussing the very subject of the form of the British skull, we remarked: (Prehistoric Annals of Scotland, 2nd Ed., Vol. I., p. 278). "The insular Anglo-Saxon race in the Anglian and Saxon districts, deviates from its continental congeners, as I conceive, mainly by reason of a large intermixture of Celtic blood, traceable to the inevitable intermarriage of invading colonists, chiefly male, with the British women. But if the Celtic head be naturally a short one, [as affirmed by certain authorities], the tendency of such admixture of races should have been to shorten the hybrid Anglo-Saxon skull, whereas it is essentially longer than the continental Germanic type." Nor is this idea of the modern Briton being the representative of the Teutonic, no less than the Celtic races of early centuries, a novelty of recent date. In the first edition of the above work, (1851, p. 353), the Celtic races are spoken of as "once more nomade, or mingling their blood with the more civilised tribes which are gradually securing a footing in the south-eastern portions of the island. The first stream of Teutonic colonization had set in, which, followed successively by the Romans with their legions of foreign auxiliaries, by Saxons, Angles, Scoti, Norwegians, Danes, and Normans, produced the modern hardy race of Britons."

The same argument is thus repeated in this journal: (Vol. IX., p. 379, 1864). "*The Anglo-Saxon cannot be affirmed to be a pure race.* Apart from later Danish, Norse and Norman intermixture: it differs mainly, as I conceive, from its Germanic congeners, by reason of a large admixture of Celtic blood, traceable primarily to the intermarriage of Anglian and Saxon colonists with British women. Such a process of amalgamation is the inevitable result of a colonisation chiefly male, even where the difference is so extreme as between the white and the red or black races of the New World. But the Anglo-Saxon intruder

and the Native were on a par physically and intellectually; and while the former was preëminent in all warlike attributes, the latter excelled in the refinements of a civilisation borrowed both from the pagan Roman and the Christian missionary. There was nothing therefore to prevent a speedy and complete amalgamation. But if this was an admixture of a dolichocephalic with a brachycephalic race, the result should be a hybrid skull of intermediate form; whereas the modern Anglo-Saxon head is essentially longer than the continental Germanic type." That the immediate source of this long head-form is native, *i. e.*, British, is the aim of the whole argument. After marshalling a variety of evidence, in proof of a long head being characteristic alike of the ancient Gaul and Briton, the result, so far, is thus summed up: "It accordingly appears, thus far, from the various authorities referred to, that considerable unanimity prevails in the ascription of an excess of longitudinal diameter as one of the most marked characteristics of the Celtic cranium. A long but low frontal development, in which, as M. Pruner-Bey defines it, 'The forehead of the ancient Celt gains in length what it loses in height;' a flattening of the parietals, and a tendency toward occipital prolongation, are all more or less strongly asserted as characteristic of the same head-form."

The conflicting evidence is next produced, and by treating the native element as the unknown quantity, in relation to results following from the assumed amalgamation of pre-Celtic and post-Roman races with the population on which the Romans intruded, this result is arrived at: "It thus appears that where the Celtic element most predominates, the longer form of head is found. It is also noticeable that there are indications of the Gaelic and Erse type of head being longer than the British. The results, as a whole, of the classification of the known and unknown elements in tabular form, appear to involve the assignment of dolichocephalic characteristics to the undetermined Celtic element both of the French and English head."

This forms the natural sequence of ideas involved in another ethnical proposition: that of absorption as contra-distinguished from absolute extirpation of races. This idea, suggested in different aspects, in relation to other propositions, is thus summed up in my *Prehistoric Man*: (1st Ed., 1862, Vol. II., p. 340). "From all this it would seem to be justly inferred that ethnological displacement and extinction must be regarded in many, probably in the majority of cases, not as amounting to a literal extirpation, but only as equivalent to absorption. Such

doubtless it has been to a great extent with the ancient European Celtæ, notwithstanding the distinct historical evidence we possess of the utter extermination of whole tribes both of the Britons and Gauls by the merciless sword of the intruding Roman." In this sense I believe that, what is witnessed in actual process of accomplishment on this continent, where a certain percentage of "Red" blood is being taken up by the so-called "Anglo-Saxon" of the New World, has been the law within ancient historic areas; and that their modern occupants are, to some extent, the sum of all the ethnic elements that have seemed to displace each other in the long march of ages since the night of time.

This is a proposition directly conflicting alike with ideas embodied in Dr. Knox's favourite proposition, that "Race is everything," and with that of Professor Agassiz of "the close connection between the geographical distribution of animals and the natural boundaries of the different races of men." Do races ever amalgamate? Does a mixed race exist? are questions put by Dr. Knox, in order to be answered unhesitatingly in the negative. To me it rather seems that the question submitted to the ethnologist, at least within the whole historic area, is this: Does any unmixed race exist? Has any seemingly extinct race passed away, leaving no transmitted trace, or taint of blood to its successors? Hence, when treating of allophylian precursors of the historic races of Britain, I remarked, in a passage, subsequently adopted by Dr. J. Barnard Davis as the motto for his prospectus of the *Crania Britannica*: (*Prehist. Annals*, 1st Ed., p. 193, 1851). "They are our ancestry, even though we may question our lineal descent; our precursors, if not our progenitors. From them we derive our inheritance and birthright; nor, among all the later mingling of races, can we assume that no drop of their blood mingles in our veins."

Let us then consider the various points embodied in the statement made by Mr. C. Carter Blake as to claims of originality, and priority of publication, in reference to certain ethnical British characteristics.

(1) "The fact that the modern English possess long skulls was first established by the plaintiff," viz., in 1866. But in 1864, we had already published this statement: "Amid considerable diversity in minute characteristics, the English heads appear to be divisible into two classes, of which one, characterised by great length, and slight excess of breadth in the parietal as compared with the frontal region, appears to be the Anglo-Saxon head; the other, also long, but marked by a sudden tapering in front of the parietal protuberances, and a narrow

prolonged frontal region, is the insular Celtic type." Mr. Pike, it may be added, does not assert an invariable uniformity in the English head-form. His own independent observations have been numerous, and extended over a wide area; and necessarily precluded any such hypothetical generalisation. He refers, for example, to Wiltshire as presenting the longest type of head; to a variety of types met with in *Wales; and to the predominance of "the Cymric type," meaning* thereby, however, not Welsh, but originally native to those countries from whence the Cymri came; and so asserts: "it is certainly to one branch of the Cymric stock that we owe the chief characteristic of our English heads." Whilst, however, Mr. Pike repeatedly guards against the assumption that the word "Cymric" is used as synonymous with Welsh, he defines among the results determined by his study of physical characteristics: "That all the evidence which has been collected shows the Cymric skull to be the long oval form, but slightly longer in proportion to its breadth than the typical English skull; that the ancient Britons were remarkable for their lofty stature, no less than the modern English; and that this lofty stature is especially found among the most Celtic population of the West."

(2) Mr. C. C. Blake proceeds: "The plaintiff had first combined the propositions that the Celtic skull was long, that the Teutonic skull was short, that the modern English skull is long, and that, therefore, the English are the descendants of the ancient Britons." (1866). But in 1863, I had ascribed to the brachycephalic crania of British tumuli, assumed by Dr. J. B. Davis to be Celtic, "an Allophylian, perhaps a Turanian" origin; (*Prehist. Annals,* Vol. I., p. 277); had shown that, while many skulls of the Anglo-Roman period approximate to this type, "on the other hand, the predominant skull-forms of the modern Welsh, the Highlanders of the most purely Celtic districts of Scotland, and the seemingly unadulterated population of the south-west of Ireland," all differ from that type; had quoted Retzius as to the prevalence of the very long head-form in England proper, as well as in Wales, Scotland and Ireland; and then followed it up by the passage already given, asserting that the Anglo-Saxon deviates from the continental Germanic type by reason of a large intermixture of native blood, traceable to British mothers. Again, when selecting examples of crania derived from the earliest native Christian cemeteries in the purely Celtic or Pictish regions of Scotland, I remarked: "even if allowance be made for considerable admixture with other races, Roman,

Saxon or Danish, still a general approximation to the native type-form, and its frequent reappearance in full development, are to be looked for." When specially discussing the cranial characteristic of the British and Gaulish Celt, (*Canadian Journal*, Vol. IX., p. 401, 1864), "that the Teutonic skull was short," is asserted, when discussing the very question of that Teutonic element affecting the native Celtic one; and, what is meant by "Celtic" and Teutonic or "Germanic," is thus defined: "Of the Germanic elements the Saxon is exclusively English; *the Anglian, and apparently the* Frisian, *Scottish. Of the Scandinavian* elements, the Danish predominates in England, the Norwegian in Scotland; and the latter was very slightly affected by any Norman element." Bearing this in view, the proposition of determining the Celtic element by comparison of the modern head-form and the diverse types traceable to the various native and immigrant races, is thus tested in relation to the Teutonic skull: "Taking the known elements as our guide: if all but the Celtic form can be determined, there can be no insurmountable difficulty in ascertaining its type. Assuming the modern German head as a key to the influences of Frank and other Germanic intermixture, it is decidedly shorter and more globular than the Anglo-Saxon head." The very latest of those results, let it be observed, were published in 1864; and cannot therefore be properly said to confirm others which did not make their appearance till 1866; though they are undoubtedly confirmed by them.

Without, therefore, doubting in any degree Mr. Luke Owen Pike's statement in court, that "he had devoted much labour, time and expense in collecting evidence for his argument from physical characteristics, which, whatever might be its value, he believed to be original;" we may be permitted also to lay claim to the devotion of much labour, time and expense, with ends in view, in many respects similar; and to priority in the publication of results, in so far as they approximate to one another.

The forms of head characteristic of diverse races present at successive eras in Britain, long constituted a favourite subject of research with me, as one means calculated to throw light on periods anterior to written history. The earliest results of such investigations were brought under the notice of the British Association for the Advancement of Science, in 1850, in a communication entitled an "Inquiry into the evidence of the existence of Primitive Races in Scotland prior to the Celtæ." In this I, for the first time, asserted the existence of an early

race, prior to the Brachycephalæ of the ordinary tumuli, for which I suggested the term Kumbecephalic, from their long, boat-shaped head. The evidence was subsequently challenged as inadequate to sustain so comprehensive a conclusion. But further proofs tend to confirm it; and since that date all faith in the Celtæ being the primeval occupants of Britain has been effectually shaken by the disclosures of traces of *Drift-folk, and other primevals, compared with* whom *British Celts* are modern enough.

Removal from the scenes of such explorations among Britain's prehistoric traces prevented my following out the archaic researches referred to, to their legitimate results. But materials are accessible enough in Canada and the United States for pursuing the inquiry into the characteristic type, or types of the modern British head; and in 1864 I was able to publish the conclusions, to which further observation has lent additional confirmation: that, amid many subvarieties to be found in the prevalent head-forms of the British Islands, the long British head is divisible into two sub-types, one of which is characterised by comparatively slight and gradual narrowing, in passing from the parietal to the frontal region, and with good elevation in the latter; while the other passes somewhat abruptly from a wide parietal to a narrow, more elongated, and depressed frontal region, in which the loss in breadth and height is compensated for by the greater length. But in numerous examples the two types are so interblended as to confirm the idea of a far greater interfusion of Saxon and Celtic blood, than the popular use of the distinctive terms implies. During the past winter (1868-9) I had an opportunity of testing, by means of the conformateur, the head-forms of a whole battery of Artillerymen recruited in England. The prevalent form was a long oval, with some variations towards the narrower and longer frontal region; but there was no well-defined predominance of any single uniform shape; no determinate Anglo-Saxon or Celtic type; but intermediate forms, with greater or less preponderance of one or the other characteristic.

In seeking to determine both the sources and predominant character of British head-forms, the labours of French ethnologists contribute valuable aid. It is not merely that we recognise the Celtic element as common alike to France and England: Briton and Breton; Gael and Gaul; Frank, Anglo-Saxon, Dane and Norman: have all contributed —though in very diverse degrees,—to mould the race and history of both countries. Hence any carefully conducted researches which fur-

nish materials for comparison between the prevalent head-forms of the two countries are valuable, as means towards determining the constancy of ethnical type-forms, or the degree and rate of change which they undergo under certain well defined circumstances, and within a known period. The elaborate tables of measurements of Parisian crania selected by Dr. Spurzheim as characteristic examples of the French Celtic head, appeared to me, accordingly, calculated to furnish a contribution of some value to the comparative craniologist. But their minuteness has defeated the purpose I entertained of adding the whole as an appendix to this paper. After preparing them for the press, the space required has proved to be much larger than could be spared for a subject of limited interest, especially when presented in a tabular form.

As a contribution to minute craniometry, Dr. Adam's elaborate tables would, I doubt not, have been welcomed by those who have devoted special attention to this department of ethnical study. But the system on which they are based is set forth sufficiently clearly in previous pages; and the details already selected for comparison with other tables of cranial measurements furnish some illustration of the results. To those I now add another selection of a different character.

No mode of comparison brings out more clearly some of the most important differences in skull-forms, alike in diverse races of men, and in the lower animals, than viewing them on the base. Professor Owen long since demonstrated the value of this method. Dr. Prichard illustrates it in his "Researches" by presenting such a drawing of the skull of one of Napoleon's guards, killed at Waterloo, in juxtaposition with those of a pure blood Negro, an Esquimaux, and an Orang, (*Simia satyrus*). The illustrations of the "Crania Britannica" also include similar full size views of a British skull, from a barrow on the Yorkshire Wolds; an Anglo-Saxon skull from a barrow on the Sussex Downs; and a Roman skull—that of Theodorianus,—from an inscribed sarcophagus at York. Dr. Davis remarks of the last: "The foramen magnum is 1.4 inch in its longitudinal diameter, and an inch across its middle,"—in this respect, exceeding in length, but falling considerably short of the mean breadth of apperture, as shown in the fifteen male Parisian crania of the following table. But the whole contour of the Roman skull when seen in this aspect is compact, and uniformly balanced, as compared with either of the others; and especially when viewed alongside of the Anglo-Saxon one, its greater posterior development is very remarkable.

The position of the great occipital foramen in man bears an important relation to his whole structure, and the upright attitude which is natural to him. In the enormous development of the spinous processes of the Gorilla, for example, as compared with the comparatively slight vertebral column, on which the human skull, with its greater cerebral mass rests, we see the totally different functions of the climbing anthropoid and of man; and the same is illustrated by the relative position of the occipital foramen in the two. In this, indeed, as in other respects, the Gorilla diverges more remotely than others of the anthropoids, from man. But as compared with any ape or other animal which may be selected as the most nearly approaching to him in structure, the space between the occipital foramen and the extreme posterior point of the skull in man is great; while in most animals, as the horse, dog, sheep, and even in the howler monkey, (*Mycetes seniculus*), there is no space behind the foramen. In the highest type of man, the lofty and amply developed forehead is the characteristic feature; but the point in which his cranium is most notably distinguished from that of the brute is the occiput, with its corresponding cranial cavity and great posterior mass of brain.

The dimensions of the occipital foramen have already been adverted to. Its relative size in different races of men long since attracted the notice of the comparative anatomist. But indeed the dimensions of al-the foramina of the skull invite attention, when instituting comparisons between crania of diverse races. The various nerves issuing from them are asserted by more than one competent observer to have been found thicker and stronger in the Negro than the European; whereas, on the contrary, the occipital foramen of the Negro cranium has been repeatl edly noted as smaller.

I have accordingly selected from Dr. Adam's tables those measurements which determine the size of the occipital foramen, and its relations to other parts of the cranium. Comprehensive, however, as his measurements are, no attempt has been made to determine the relative positions of the zygomata and occipital foramen; though the place of the zygomatic arch in the basis cranii in man is only less characteristic than that of the great foramen. In man, the entire zygoma is included in the anterior half of the base of the skull; whereas in the Baboon, Orang and Gorilla, it occupies the middle region, and from its greater development, measures fully a third of the whole antero-posterior diameter. The dimensions of the zygoma in each of the Parisian crania are minutely given; but they are not, in themselves, of sufficient

importance to be reproduced, apart from other measurements necessary to determine their relative value in reference to the whole dimensions of the head. But Dr. Adam has aimed, in Nos. 25, 26, at indicating the position of the zygomata, by ascertaining the place of each in relation to the stylo-mastoid foramen on the same side of the cranium. Those measurements are accordingly included in the following tables. In them, as in others of the measurements, the two columns represent the proportions of corresponding features on the two sides of the crania; and in so far as they differ, they indicate unsymmetrical development. This is proved to be the case in the majority of crania subjected to the test; and confirms the opinion I have already deduced from extensive observations, that a perfectly symmetrical human head, in which the one hemisphere is the exact counterpart, or reverse of the other, is a rare exception, rather than the rule.

Reference to the details of Dr. Adam's system of measurements, as given on previous pages, with their corresponding numbers, will enable the reader to follow him in the few results selected here in their relation to the general system embraced in his comprehensive series. I have retained the order in which he has placed the crania, irrespective of their numbers; and also the spaces that occur in his tables. Possibly Parisian Anthropologists may be able, by reference to the originals, to perceive some reason for the subdivisions of the male and female groups, as indicated by such interruption of the continuity of the columns of figures. I have assumed the second group to be female crania, for reasons already assigned; and have added to each table the mean results and also the total mean of the two combined.

The measurements selected are: 7. From the inial margin of the foramen spinale to the coronal point of the occipital bone. 8. From the same to the meeting of the coronal and sagittal sutures. 11. From the glabellar margin of foramen spinale to the coronal point of the occipital bone. 13. From the same to the meeting of the coronal and sagittal sutures. 18. From the same to the inial sinuous margins of palatal bones. 25. From glabellar surface of right zygomatic enclosure to inial surface of right stylo-mastoid foramen. 26. From left do. to left do. 62. Distance between glabellar and inial margins of foramen spinale. 63. Distance between lateral margins of do.

MEASUREMENTS OF PARISIAN CRANIA.

MALE CRANIA.

No.	7	8	11	13	18	25	26	62	63
37	3.13	5.53	3.93	5.10	1.54	2.71	2.70	1.44	1.20
29	3.70	5 50	4.10	4.71	1.76	2.64	2.67	1.25	1.17
4	3.84	5.86	4.06	5.05	1.80	2.86	2 97	1.42	1.24
36	3.60	5.70	4.10	5.23	1.86	2.84	2.82	1.26	1.09
27	3.66	5.90	4.27	5.28	1.46	2.50	2.50	1.23	1.17
25	3.70	6.20	4.40	5.66	1.80	2.90	3.00	1.48	1.26
2	4.03	6.30	4.50	5.67	2.00	2.97	2.86	1.42	1.20
9	3.30	5.55	4.25	5.30	1.55	2.52	2.52	1.43	1.18
5	3.73	5.86	4.40	5.48	1.76	2.82	2.65	1.27	1.15
50	3.80	6.12	3.92	5.11	2.05	2.92	3.02	1.36	1.22
39	3.60	5.60	4.05	5.01	1.77	2 82	2.84	1.26	0.99
41	3.64	5.60	4.30	5.06	1.80	2.78	2.76	1.28	1.17
34	3.72	5.72	4.43	5.40	1.77	2.74	2.76	1.90	1.20
23	3.80	5.77	4.64	5.42	1.74	2.80	2.72	1.24	1.07
7	3.90	5.94	4.70	5.43	1.76	2.70	2.73	1.36	1.18
Mean.	3.68	5.81	4.27	5.26	1.76	2.77	2.77	1.37	1.17

FEMALE CRANIA.

No.	7	8	11	13	18	25	26	62	63
15	3.47	5.25	4.23	4.75	1.44	2.40	2.40	1.33	1.18
31	3.72	5.24	4.35	4.70	1.70	2.80	2.80	1.30	1.07
1	3.62	5.40	4.40	5.00	1.82	2.97	2.94	1.28	1.12
26	3.28	5.27	4.07	4.80	1.52	2.62	2.58	1.36	1 15
12	"	"	3.86	4.80	1.70	2.73	2.71	"	"
16	3 66	5 63	4 50	5.24	1.65	2.66	2.64	1.29	1.00
13	3.73	5.36	4.33	4.77	1.60	2.64	2.64	1.20	1.20
22	3.60	5.70	4.40	5.32	1.64	2.65	2.80	1.26	1.06
40	3.42	5.10	4.25	4.72	1.86	2.83	2.80	1.22	0.99
32	3.62	5.17	4.37	4.77	1.70	2.84	2.87	1.29	1.08
38	3.80	5.74	4.52	5.17	1.85	2.88	2.88	1.32	1.13
3	3.80	5 23	4.62	4.66	1.61	2.43	2.58	1.30	1.14
8	3 25	5.20	3.75	4.53	1.68	2.38	2.43	1.21	1.00
Mean	3.58	5.36	4.28	4.86	1.67	2.68	2.70	1.28	1.09

TOTAL MEAN, MALE AND FEMALE.

	7	8	11	13	18	25	26	62	63
	3.634	5.609	4.275	5.076	1.721	2.727	2.735	1.332	1.1 34

The illustrations selected in the above tables from the very elaborate series of measurements, of which the system has been detailed in previous pages, will suffice meanwhile to illustrate the character of the whole. Still further, the details previously furnished may serve as a contribution towards the determination of the most reliable and useful data for a comparative system of craniometry. If by means of a uniform system we were enabled, through the independent labours of competent observers in various parts of the world, to accumulate a large amount of such minute measurements, in relation to the crania of specific races, or of well-defined regions, so as to admit of a comparison of results: we should, at least, ascertain thereby how far the mean results in relation to each helped to exhibit any notable specialities. By such means we might hope to eliminate from the whole certain constants presenting a specific ethnical significance. We can scarcely fail, at least, to determine thereby how far the expression of head-forms, by means of measurements, tends to exhibit the specialities of the individual skull, or to reveal the cranial characteristics of diverse races of men.

ON THE CHANGES OF BAROMETRIC PRESSURE, AND PRESSURE OF VAPOUR THAT ACCOMPANY DIFFERENT WINDS, AT TORONTO,

FROM OBSERVATIONS IN THE SEVEN YEARS, 1860-66 INCLUSIVE.

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The object in the following paper is to shew the connection which subsists between the direction of the wind and the rapidity of the changes, whether of increase or diminution, which take place in the pressure of air and of vapour.

The changes considered in the investigation are limited to those in which the direction of the wind did not vary between two consecutive

observations by more than $22\frac{1}{2}°$ on each side of one of the eight principal points; and as such comparative constancy in direction will usually occur only when the interval is short, it was found convenient to employ only the differences between 6 a.m. and 8 a.m., between 2 p.m. and 4 p.m., and between 10 p.m. and midnight.

The total change in the reading between two consecutive observations being first diminished by the change due to diurnal variation, the remainders were then classed according to the direction of the wind in the interval, and their averages in each class taken, for the year collectively as well as separately for the two half-years.

The average changes of barometric pressure which take place in two hours, and found in the manner just described, are given below for each of the principal eight point of the wind's direction.

APRIL TO SEPTEMBER.

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
+·0085	—·0043	—·0113	—·0037	—·0084	—·0041	+·0132	+·0150

OCTOBER TO MARCH.

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
+·0087	—·0160	—·0334	—·0313	—·0222	—·0037	+·0168	+·0209

THE YEAR.

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
+·0086	—·0103	—·0215	—·0164	—·0129	—·0039	+·0166	+·0180

The most probable values of the changes corresponding to intermediate directions of the wind are given by the following formulæ, where Ψ_1 Ψ_2 Ψ_3 represent the changes for the two half years and year, and θ the angular distance of the point from which the wind blew, measured from the North towards the East, end expressed in degrees.

APRIL TO SEPTEMBER.

$$\Psi_1 = +\cdot0004 + \cdot0125 \sin(\theta + 141° 29') + \cdot0044 \sin(2\theta + 186° 29') + \cdot0025 \sin(3\theta + 14° 2')$$

OCTOBER TO MARCH.

$$\Psi_2 = -\cdot0075 + \cdot0281 \sin(\theta + 148° 14') + \cdot0024 \sin(2\theta + 160° 49) + \cdot0014 \sin(3\theta + 30° 15')$$

THE YEAR.

$$\Psi_3 = -\cdot0028 + \cdot0195 \sin(\theta + 148° 2') + \cdot0040 \sin(2\theta + 174° 17') + \cdot0021 \sin(3\theta + 10° 47)$$

PRESSURE OF DRY AIR.

The average changes in the pressure of dry air in two hours with different winds, and the corresponding formulæ of interpolation, are as follows.

APRIL TO SEPTEMBER.

N.	N.E.	E.	S.E.	S.	S.W.	N.	N.W.
+·0146	—·0009	—·0128	—·0088	—·0122	—·0046	+·0195	+·0219

OCTOBER TO MARCH.

N.	N.E.	E.	S.E.	S.	S.W.	N.	N W
+·0110	—·0182	—·0371	—·0342	—·0240	—·0026	+·0195	+·0240

THE YEAR.

N.	N.E.	E.	S.E.	S.	S.W	N.	N W.
+·0128	—·0091	—·0243	—·0194	—·0160	—·0034	+·0195	+·0229

APRIL TO SEPTEMBER.

$$\Psi_1 = +\cdot0021 + \cdot0182 \sin(\theta + 135^\circ 13') + \cdot0048 \sin(2\theta + 193^\circ 10') + \cdot0034 \sin(3\theta + 10^\circ 18')$$

OCTOBER TO MARCH.

$$\Psi_2 = -\cdot0077 + \cdot0317 \sin(\theta + 149^\circ 4') + \cdot0030 \sin(2\theta + 156^\circ 2') + \cdot0016 \sin(3\theta + 217^\circ 29')$$

THE YEAR.

$$\Psi_3 = -\cdot0021 + \cdot0287 \sin(\theta + 144^\circ 46') + \cdot0040 \sin(2\theta + 174^\circ 17') + \cdot0026 \sin(3\theta + 15^\circ 39')$$

PRESSURE OF VAPOUR.

The average changes in the pressure of vapour in two hours that accompany winds from the eight principal points, and the formulæ for finding the most probable change, with the wind blowing from any intermediate point, are given below :

APRIL TO SEPTEMBER.

N.	N.E.	E.	S.E.	S.	S W.	W.	N.W.
—·0057	—·0034	+·0020	+·0035	+·0042	+·0001	—·0073	—·0069

OCTOBER TO MARCH.

N.	N.E.	E.	S.E	S.	S.W.	W.	N.W.
—·0025	+·0009	+·0037	+·0031	+·0017	—·0013	—·0032	—·0039

THE YEAR.

N.	N.E.	E.	S.E.	S.	S W.	W.	N.W.
—·0041	—·0012	+·0025	+·0034	+·0034	—·0007	—·0046	—·0054

APRIL TO SEPTEMBER.

$$\Psi_1 = -\cdot00169 + \cdot00607 \sin(\theta + 305^\circ 49') + \cdot00096 \sin(2\theta + 88^\circ 48') + \cdot00110 \sin(3\theta + 181^\circ 2')$$

OCTOBER TO MARCH.

$$\Psi_2 = -\cdot00018 + \cdot00385 \sin(\theta + 330^\circ 26') + \cdot00034 \sin(2\theta + 287^\circ 64) + \cdot00022 \sin(3\theta + 243^\circ 26')$$

THE YEAR.

$$\Psi_3 = -\cdot00084 + \cdot00479 \sin(\theta + 312^\circ 43') + \cdot00035 \sin(2\theta + 86^\circ 44') + \cdot00037 \sin(3\theta + 216^\circ 15')$$

If in the nine foregoing formulæ, the variable angle (θ) be made equal in succession to 0, 11° 15′ (11° 15′)×2, (11° 15′)×3, &c. &c. ..... (11° 15′)×31, the changes of pressure will be found which

would most probably occur if the wind were to blow steadily for two hours from each of the thirty-two points of the compass.

The results are given in the annexed Table.

Table shewing the changes in Barometric Pressure, Pressure of Dry Air, and Pressure of Vapour, which take place in two hours, during winds from each of the Thirty-two points of the Compass.

	Barometric Pressure.			Pressure of Dry Air.			Pressure of Vapour.		
	April to Sept.	Oct to March.	Year.	April to Sept.	Oct to March.	Year.	April to Sept.	Oct. to March.	Year.
North	+·0083	+·0088	+·0083	+·0144	+·0110	+·0127	—·0057	—·0026	—·0042
NbE	+·0058	+·0035	+·0044	+·0117	+·0046	+·0083	—·0056	—·0019	—·0037
NNE	+·0029	—·0026	—·0001	+·0082	—·0027	+·0032	—·0052	—·0010	—·0030
NEbN	—·0005	—·0092	—·0050	+·0040	—·0105	—·0027	—·0045	·0000	—·0021
NE	—·0041	—·0158	—·0100	—·0007	—·0182	—·0088	—·0034	+·0010	—·0011
NEbE	—·0074	—·0220	—·0146	—·0054	—·0252	—·0146	—·0020	+·0019	·0000
ENE	—·0099	—·0272	—·0184	—·0093	—·0309	—·0195	—·0005	+·0027	+·0009
EbN	—·0112	—·0310	—·0208	—·0120	—·0349	—·0228	+·0009	+·0033	+·0017
East	—·0113	—·0334	—·0218	—·0131	—·0372	—·0244	+·0020	+·0036	+·0024
EbS	—·0103	—·0343	—·0214	—·0127	—·0379	—·0243	+·0028	+·0037	+·0028
ESE	—·0086	—·0340	—·0199	—·0114	—·0373	—·0230	+·0032	+·0037	+·0032
SEbE	—·0068	—·0329	—·0180	—·0098	—·0359	—·0211	+·0034	+·0035	+·0034
SE	—·0055	—·0312	—·0160	—·0086	—·0341	—·0192	+·0035	+·0032	+·0036
SEbS	—·0052	—·0293	—·0147	—·0084	—·0321	—·0178	+·0036	+·0029	+·0037
SSE	—·0058	—·0273	—·0132	—·0093	—·0298	—·0170	+·0039	+·0025	+·0037
SbE	—·0071	—·0250	—·0134	—·0109	—·0272	—·0166	+·0041	+·0021	+·0036
South	—·0085	—·0222	—·0131	—·0124	—·0239	—·0161	+·0042	+·0016	+·0033
SbW	—·0093	—·0187	—·0123	—·0131	—·0199	—·0149	+·0040	+·0010	+·0027
SSW	—·0090	—·0145	—·0106	—·0122	—·0149	—·0124	+·0032	+·0003	+·0018
SWbS	—·0071	—·0094	—·0077	—·0093	—·0090	—·0086	+·0019	—·0004	+·0007
SW	—·0038	—·0037	—·0036	—·0044	—·0027	—·0033	+·0001	—·0012	—·0006
SWbW	+·0005	+·0022	+·0014	+·0018	+·0038	+·0028	—·0021	—·0019	—·0019
WSW	+·0052	+·0079	+·0066	+·0084	+·0099	+·0091	—·0042	—·0025	—·0030
WbS	+·0096	+·0129	+·0115	+·0146	+·0152	+·0148	—·0060	—·0029	—·0040
West	+·0131	+·0168	+·0154	+·0195	+·0194	+·0194	—·0073	—·0033	—·0047
WbN	+·0153	+·0196	+·0181	+·0225	+·0223	+·0224	—·0079	—·0035	—·0052
WNW	+·0162	+·0211	+·0194	+·0237	+·0241	+·0239	—·0079	—·0037	—·0054
NWbW	+·0160	+·0214	+·0194	+·0234	+·0247	+·0239	—·0075	—·0038	—·0054
NW	+·0151	+·0203	+·0184	+·0222	+·0242	+·0230	—·0069	—·0038	—·0053
NWbN	+·0137	+·0191	+·0167	+·0204	+·0227	+·0213	—·0063	—·0037	—·0051
NNW	+·0121	+·0166	+·0144	+·0186	+·0200	+·0190	—·0059	—·0035	—·0049
NbW	+·0103	+·0132	+·0116	+·0166	+·0161	+·0162	—·0057	—·0031	—·0046

By examining the table it will be seen that on the average of the year the barometer rises with a wind from any point between S W b W

(measured from left to right) to N b E, and that it falls with winds from NNE to SW. The same rule also holds (within a point) in summer and winter separately, and is true also with respect to the changes in the pressure of dry air. The pressure of vapour increases with a wind between E N E to SW b S and diminishes with a wind between SW and NE.

On the average of the year, and during the winter half-year, both the rise and fall have an uninterrupted progression; and the same is true in every case where the change is an increase; but in the summer half-year, besides the maximum rate of barometric fall which occurs with a wind from E, there is a second inferior maximum fall when the wind is from S b W. There are also two maxima in the rate with which the pressure of dry air diminishes during the summer. They are of equal magnitude —·0131 and also occur with winds from E and S b W.

The most rapid changes, together with the winds that accompany them, are shewn in the following tables:

BAROMETRIC PRESSURE.

	SUMMER.		WINTER.		YEAR.	
	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.
Most rapid rise	+·0162	WNW	+.0214	NWbW	+·0194	NWbW¼W
Most rapid fall	—·0113	E	—·0343	EbS	—·0218	E
	—·0093	SbW				

PRESSURE OF DRY AIR.

	SUMMER.		WINTER.		YEAR.	
	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.
Most rapid rise	+·0237	WNW	+·0247	NWbW	+·0239	NWbW¼W
Most rapid fall	—·0131	E	—·0379	EbS	—·0244	E
	—·0131	SbW				

PRESSURE OF VAPOUR.

	SUMMER.		WINTER.		YEAR.	
	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.	Change in 2 hours.	Wind.
Most rapid rise	+·0042	S	+·0037	EbS¼S	+·0037	SSE¼E
Most rapid fall	—·0079	WbN¼N	—·0038	NW¼W	—·0054	NWbW¼W

HIGHER EDUCATION FOR WOMAN.

An address on higher education, inaugurating a series of lectures designed for ladies, was delivered by Professor Wilson, of University College, in the Music Hall, Toronto, on Friday, the 22nd October; and as it marks the commencement of a movement which, if carried out in the spirit in which it has been begun, is fraught with results of the highest importance, not only to this Province but to the whole Canadian Dominion, we have thought it well to give it permanent record in this journal. The gentlemen who have undertaken to conduct this first experimental course, preparatory to the organization of a permanent scheme on a more extended scale, should the results hold out any adequate encouragement for such a procedure, are Professors J. B. Cherriman, M.A., and D. Wilson, LL.D., of University College, and Professor Geo. P. Young, M.A., of Knox's College, Toronto. The result, so far, we may add, has surpassed the expectations of the most sanguine promoters of the movement. Upwards of one hundred and fifty tickets have been taken by lady-students in the three branches of Logic, Astronomy, and English Literature ; and the zeal and perseverance manifested by them thus far in those studies, give abundant assurance of success. On the opening day the large lecture-room of the Mechanics' Institute was crowded with an audience composed exclusively of ladies, to whom Dr. Wilson delivered the following address :—

We meet to-day for the purpose of inaugurating a movement which aims at securing for ladies facilities for training in the higher departments of mental culture, in some degree corresponding to those already available for young men. The liberal scale on which this province has provided for education in the higher departments of learning has already won for it an honourble preëminence among the states and provinces of this western hemisphere. But the ample provision thus secured for the training of young men, in letters, science, and philosophy, only renders thereby the contrast more striking and invidious, which leaves to the other sex nothing beyond the Common, and the Country Grammar School. The need of something more cannot be doubted. To what extent the want is as yet felt among ourselves, the present movement is designed in some degree to test. The duty has accordingly been imposed on me of presenting the subject to your notice, with the view of acertaining whether there really exists

among the ladies of Toronto, and of Ontario generally, such a desire for higher culture, and such a willingness to do the work of actual students: not by mere attendance on popular or semi-popular lectures; but by an actual grappling with the difficulties and pleasant toils indispensable to the mastery of all science and true scholarship, as to render it desirable to organize a scheme for their higher education.

Among many signs of the times, we cannot overlook, as a very significant one, the movement in England, the United States, and elsewhere, for what it termed "Woman's Rights." It has been embalmed in the permanent literature of the age in "The Princess" of Tennyson; and enforced anew by the greatest of England's poetesses in her "Aurora Leigh." Amid many follies, inseparable from any great movement, it has its undercurrent of genuine worth, replete with promise for the future. In our own Province it has recently manifested itself in a very practical form, in the successful assertion of equal rights for girls and boys to the advantages of the Grammar Schools; and with that secured, it need not surprise us to find it already being followed up by demands for a share in those higher privileges for which such schools are rightly regarded as preparatory.

At the very initiation of a movement for the higher education of woman, and so for securing for her similar advantages to those enjoyed by young men at Universities, it is important to recognise very clearly all that is implied in the distinction between school and college. It is not the number of pupils that constitutes the difference. The gathering together of scores, or hundreds of boys or girls into one great building, and giving it a high-sounding name,—though sanctioned by decrees of Parliament, or by charter under the Royal sign-manual itself,—will not in any degree help to solve the problem.

A considerable amount of all education must of necessity be acquired arbitrarily, and with, at best, but a negative volition. The child learns that indispensable preliminary to knowledge, the alphabet, without perceiving any utility in its troublesome phonetic symbols; spelling, reading, the multiplication table, and much else follow, and are mastered in like manner, at the dictation of others, with scarcely a thought of any ulterior use to be derived from them. Under the aptest and most gifted instructor the studies of school girls or boys must be carried on in obedience to his will, and guided by his perception of a higher aim, rather than their own. The reasoning faculty, as applied at times by a precocious child to such rudimentary studies, retards instead of accele-

rating progress. It is altogether different with the college student. There that period is assumed to have been at length reached in which mere pupilage is at an end. The change of name from *pupil* to *student* is itself significant of this and much more. To every mind a time at length comes when it passes from the merely receptive to the perceptive stage; the aims and uses of study begin to be clearly recognised; the adaptation of preliminary acquirements as means to a higher end is seen; and a willing hand is reached forth to grasp the keys that are to unlock rich treasures of knowledge.

Whenever this stage of intellectual development has been reached, a change not only in the mode of instruction, but also in its place, its associates, and its teachers, is all-important. The child must quit its cradle, its go-cart, and all other appliances of the nursery, if it would not be retarded in the healthful growth of its limbs. And so it is with the mind. The school room is its fitting nursery, where it, too, developes dormant powers, and learns the use of growing energies, until it claims to stand alone, and to obey its own volitions. Then, the passing from school to college—from halls in which it has been compelled to receive, to those in which it is invited to acquire knowledge,—constitutes in the very change an educational element the importance of which can scarcely be overestimated.

It is in this respect, I believe, fully as much as in any other, that woman's mental culture is inadequately provided for. She is taught by all the conventional usages of society to regard education as a thing incompatible with womanhood. She emerges from the chrysalis state of the school-girl, to "come out" into a world brilliant with flowers, and butterflies, and all the gay realities of a life which recognises no place for intellectual culture. She puts away education with other "childish things;" and, while the young man looks back on college life as the most covetable period of existence; her happiest associations are with the day of her emancipation from school. Nor is this a mere passing fancy. It gives the key to all her conversation, and prompts the style in which she is addressed. In her society good manners forbid the intrusion of the sciences; if letters venture within her hearing, the pedant courteously translates his scraps of Latin for her benefit; the logician styles inconsequential reasoning *Woman's Logic*, and is rewarded with a smile; the mathematician is free to take for granted that in her presence,

"The hard-grained muses of the cube and square are out of season;"

and as for political economy, the "wealth of nations," and the science of government : it is unmannerly to name them in her company. She shrinks from a discussion of those principles on which national freedom depends; and resents the epithet *learned*, as though high mental culture were an unwomanly thing. The young man, on the contrary, is taught to regard the change from school to college as his "coming out," and emerging into manhood. He learns to recognise it in the very transference from the state of pupilage, in which he was compelled to learn, and to learn whatever was prescribed for him : to that student-life in which he is assumed to covet learning for its own sake; is invited to accept the coöperation of tutors to aid him in its mastery; and, to an ever increasing extent, is admitted to exercise an intelligent discrimination in the choice of his studies.

The practical importance of this distinction cannot, I believe, be exaggerated. I am accustomed yearly to watch with interest the commencement of this novel experiment on our University matriculants; and to observe the change when they fairly catch the idea that school-boy life is at an end, and respond to the new incentives which appeal to them for intelligent coöperation in the work of mental culture. From this all-important influence our present system of female education entirely excludes woman. Sooner or later every college student recognizes the change involved in this transitional stage between youth and manhood; learns to "put away childish things;" to become his own instructor; and to perceive that the ablest professor can do no more than supplement his own efforts : co-operate with him in so far as he is himself willing arduously to climb the heights on which alone knowledge is to be won.

Nor is the influence on the teacher to be overlooked. The girl tarries to the close under the care of those who must bend all their faculties to the communication of rudimentary knowledge to the passive, if not the reluctant mind; whereas the boy passes from such instructors to others, not necessarily superior in gifts or acquirements to many who are labouring with devoted zeal in the preparatory stages of youthful culture; but who are elevated into a more genial, and, therefore, a more influential relationship, by learning to regard themselves as fellow-workers with the student : the pilots of a barque manned by willing hearts and hands, eager to urge it onward in a prosperous voyage.

And let me here guard against the assumption that there is anything

in this movement antagonistic to the Ladies' Schools already in existence in our midst. On the contrary, should this scheme succeed, it will give a fresh impetus to the higher branches of education in the schools; and call the best energies of their teachers into play, to train up pupils fitted to take advantage of facilities akin to those now supplied by the Universities for the other sex; and which, by so doing, have already contributed largely to the improvement of the Grammar Schools. A competition among Ladies' Schools, as to which shall turn out the best educated candidates for higher honours, could not fail to react on teachers and pupils with a stimulus wholly wanting at present in our institutions for female education.

It is not, therefore, without reason that complaints are urged of the great disadvantages under which woman labours in relation to all higher culture. It is from no lack of appreciation of the excellence of some of our Ladies' Schools and so-called "Female Colleges," that I affirm the want in Canada, and elsewhere, in the true sense of the term, of any college for ladies, to be one of the greatest impediments to the attainment of high culture by women. The functions of school and college cannot be carried on in combination without grievous injury and impediment to true progress in the higher departments of study. Let us not be deceived by names. The institution may be a mere school, though numbering its pupils by hundreds, and giving them its valediction with honours borrowed from the academic usages of medieval Europe; it may be an excellent college, with no more than ten diligent students toiling willingly, with the aid of their tutors, and leaving at length, neither with diploma of Spinsterhood in Arts, nor any like foolish anachronism; but with the substantial scholarship: wanting which, all University degrees are mere frauds and badges of shame.

Whilst, therefore, we may smile at the pleasant fancy of our Laureate:—

> "Pretty were the sight,
> If our old halls could change their sex, and flaunt
> With prudes for proctors, dowagers for deans,
> And sweet girl-graduates in their golden hair:"

we discern beneath the seeming jest, the real beauty of girl-graduates in whom all that most gracefully adapts itself to the retiring virtues and true modesty of womanhood, shall prove perfectly compatible with the highest mental culture, and a scholarship such as was

no less becoming to the gentle lady Jane Gray, on whom was forced unwillingly the fatal crown, than to the masculine Elizabeth, whose brow it wreathed with a fitness which first taught England how regally woman can reign.

But this you will perceive to be the point to which my argument thus far leads:—If there is a genuine desire for such high culture, it is not to be accomplished by the mere lecturing of Professors to willing audiences. Only in the belief that there are those among you prepared to become fellow-workers with us; and, as true students, to strive for some mastery in those departments of science and literature which have been selected for this first experiment: have my colleagues and myself undertaken, at some sacrifice, the pleasant duty of inaugurating a scheme which has in view greatly more comprehensive results. Nor will I allow myself to believe that while London and Edinburgh, Manchester, Liverpool and Glasgow, already furnish their hundreds of fair students, zealous in the pursuit of higher education, there are not to be found among the ladies of Toronto a sufficient number to encourage us in proceeding with this movement.

Do not be deceived, however, under the idea that a series of popular lectures is aimed at. These also have their legitimate uses and value, like fine music or beautiful statuary; and when, in addition to the refined gratification which they yield, we can reckon up a substantial return of some hundred dollars to one or other of our city charities, their practical value is beyond all dispute. But the present aim is not pleasure; neither is it pecuniary reward; but profit of a strictly educational kind. Apart from those branches of higher education which pertain to purely professional training, we see no reason why liberal provision should be made for stimulating our sons to the acquisition of Ancient and Modern Languages, Mathematics, the Natural Sciences, &c., while our daughters are assumed to have completed all needful culture in the rudimentary acquirements of the school-girl. We propose, accordingly, to try the experiment, on a very limited scale, of inviting ladies to undertake some of those studies which specially belong to a University course. If the plan is ultimately to succeed, a preparatory training must be aimed at in some degree resembling that involved in the requirements of University matriculation: not the least beneficial results of which will be its influence on the curriculum and training of Ladies' Schools. When this stage has been fully reached, lectures will be required, more numerous, and embracing a

much wider field than anything now attempted. Meanwhile, let me invite your attention to our present very limited aim.

It has been decided to provide, during the present season, one brief course in each of the three departments of Literature, Mental Science, and Natural Philosophy. In carrying out this plan, Professor Young proposes to take up Logic, presenting an analysis of Thought, as regulated by its formal laws, and the methods by which it is applied in the process of inductive research, and in the formation of our scientific beliefs. Professor Cherriman has selected Astronomy as one department of the comprehensive scientific studies pursued under his guidance in the University course, which admits of treatment within the brief period you are invited to devote to his lectures. He proposes to deal with the subject, so far as may be, exactly as he would treat it with his regular undergraduate class. Nor can I conceive of a more attractive study. You will tread in the steps of Newton; review the triumphs of Leverrier and Adam,—anticipated by Mary Somerville;—and follow out processes by which the problem of the true arrangement of the universe has been solved, and the combined results of all the progress achieved in Optics, Mechanics, and Mathematics, are brought to bear on those brilliant phenomena of the Heavens which attracted the devout wonder of Hebrew patriarchs and prophets, and baffled the science of Greece's wisest philosophers.

Among old questions which come up for fresh solution under altered circumstances, that one is being presented anew with peculiar force: What is civilization? If it consists in fine architecture, rich dresses, luxuriant viands, and all the material appliances which wealth can furnish, we have no lack of the evidence of high civilization in our midst. But if mental, and not material resources are to furnish the standard of our civilization, it becomes us to bear in memory:—

> "What has tamed
> Great nations; how ennobling thoughts depart,
> When men change swords for ledgers, and desert
> The student's bower for gold."

Yet inevitably, in young countries like this, the whole energies of the community are liable to be absorbed in the working-day business of life. We can scarcely spare, as yet, that leisure class, devoted to study for its own sake. Higher education is apt to assume, accordingly, too professional an aspect. We have as promising a set of young men among our undergraduates as any University could desire. Yet

I may venture to confess that I have often reflected with sorrow, on the contrast with which I was familiar in earlier days, when the young graduates of Edinburgh were to be seen eagerly claiming a share in critical discussions and scientific researches; whilst here, our Canadian Institute languishes in the hands of the same old exotics; and we look in vain for the new generation of scientific labourers, of which the University prize lists seem so full of promise.

It will be mourned over; yet I fear it is inevitable that our best honour men shall desert science and letters; and press on, eager for the prizes in the real battle of life. But if it is premature to look for those evidences of a high civilization which belong to older nations, where the thinker finds his true sphere, and achieves his higher triumphs: there is one respect at least in which our civilization is indisputable, and that is in the position accorded to woman. In her dower-rights, tenure of property, inheritance, and admission to all privileges and duties to which she may fitly aspire, much has been done by the yeomen of Canada, without pretence of chivalry, which neither a Bayard nor a Sidney could surpass. There is no country in the world where woman enjoys more leisure and independent freedom of action, than in this Province: emancipated as she is alike from sordid cares and the oppressive exactions of social conventionalities. If men toil with even undue ardour in the pursuit of wealth, they are well content that sisters, wives, and daughters enjoy its rewards. It is a new social organization in which, unconsciously, is being conferred on woman all which once pertained to the old world's privileged orders. But let us not sacrifice thereby that womanhood which forms the fit counterpart to England's vigorous manhood. Let us not strive, as it sometimes seems to me is the result in neighbouring States, to clothe woman in all that is costly, surround her with all that is attractive and luxuriant, and then leaving her to her own resources, exclaim: "These be the lilies, glorious as Solomon's: they toil not, neither do they spin!" May we not rather look to you for the true leisure class, for whom the great world of thought lies invitingly open as your legitimate sphere?

I see in this, bright hopes for the future. A class of highly educated women in our midst would do more to elevate the tone of feeling, and to awaken nobler aspirations in the intellectual manhood of this young country, than anything else I can conceive of. I see no other means in any degree equally calculated to wean our young men of high

promise from the enslavement of professional pursuits: the mere trading drudgery—whether it be of commerce or medicine, of the counting-house or the bar,—which seems now their highest goal.

I have no thought, and equally little fear, of thrusting woman, by such means, out of her true sphere; of obtruding her into arenas which by their very requirements are the prerogative of the rougher sex; or of transforming her into the odious modern ideal of "a strong-minded woman." That is no product of higher education: widening the intellectual horizon, refining and invigorating the mind, and, like the polish of the lapidary, bringing to light all the hidden beauty native to the gem.

> "Let her make herself her own
> To give or keep, to live, and learn, and be
> All that not harms distinctive womanhood.
> For woman is not undeveloped man,
> But diverse. * * *
> Yet in the long years liker must they grow;
> The man be more of woman, she of man;
> He gain in sweetness and in moral height,
> Nor loose the wrestling thews that throw the world.
> She mental breadth, nor fail in childward care,
> Nor lose the childlike in the larger mind;
> Till, at the last, she set herself to man,
> Like perfect music unto noble words."

It is not therefore unmeet, nor in any degree utopian, that we should conceive of a true woman's college rising in our midst, provided not less liberally than those already supplied for the other sex, with professors, apparatus, libraries, and all else needful to enable you to turn to wise account that enviable leisure which you possess to an extent wholly beyond the reach of us, who, whether mechanics, traders, doctors, lawyers, or professors, constitute alike the working classes of this young country.

And if so, then I can look forward, with no ungenerous envy, to the pleasures in store for you: the delight of study for its own sake; the true enjoyment of grappling with some of those higher problems of science which demand patient labour and long research; but bring at length so abundant a reward. I have no fear that such resources will make you less learned in gracious household ways. Such elevated themes are in no degree incompatible with duties daily expected at your hands; nor with the tenderer obligations of care and loving sym-

pathy which are so peculiarly your own. Still less will such elevated themes conflict in any degree with the highest of all duties; or with those earnest and devout thoughts which the study of God's visible universe, or the investigation of the more mysterious realm of mind, is calculated to awaken. When, at length, amid the boundless works of creation, a being was made in the Divine image, gifted with reason, a living soul, he needed a companion of like endowments, that he might exchange with her the first utterances which give audable form to thought. Thenceforth the study of the Creator's works blended with the worship of Himself; nor—when reflecting on the inconceivable vastness of that universe, of which our sun and all its planets are but star-dust; and of the power with which the human intellect grapples with its immensities: weighing the sun, analysing the fixed stars, determining the very chemical elements of the nebulæ, and reducing to law and order the whole phenomena of the heavens;—can I doubt that all which science has mastered is but a page in that ample volume of God's works, on which the purified intellect shall, in a future life, dwell with ever growing delight, and ever ampler recognition of what God's infinitude is.

Such enjoyment of immortal intelligences cannot be incompatible with the devoutest reverence and worship; but will rather fitly form a part of it. Nor need we fear that, here, intellectual culture will prove irreconcilable with the practical ideas and duties of every-day life. God did not make man in his own divine image, only to place him in a world requiring fools for its government. England, the most practical of nations, has also proved herself the most intellectual. Her Bacon and Newton were no cloister-bred dreamers; nor does it surprise us—but, on the contrary, we accept it as the most natural of things,—to find a Derby or a Gladstone, amid the cares of a vast empire, sporting with the toils of highest scholarship; a Herschel stepping down from the lofty abstractions of pure science, to contend with them in the same literary arena; or a Grove or Mill, practically asserting the compatibility of the abstrusest scientific and metaphysical speculations, with their duties to clients in the courts, and constituencies in the legislative council of the nation.

And if it be thus true that an earnest devotion to letters, or the pursuit of some of the abstrusest branches of science, in no degree conflicts with the cares of statesmanship and responsible professional duties: it is an insult to our common sense to tolerate the idea that

the highest mental culture need interfere in any degree with those domestic duties which so gracefully adorn true womanhood.

I have dwelt on this point with some reiteration, because, so far as my experience goes, the sentiments I combat proceed more frequently from the lips of women than of men. There is a kind of conventional talk, not wholly unknown in our own Toronto circles, which speaks, with half a sneer of "wise women," "blue stockings," and the like; but it receives its chief countenance from yourselves. Ladies shrink from the ascription of learning, as though ignorance sat as gracefully on them as modesty, or virtue itself. It rests with you to banish this lingering remnant of medieval barbarism. Frown it down as an insult to your sex; while there lingers on your ear the plaintive close of Browning's noble dramatic lyric, "The Ring and the Book," in which the widowed poet recalls his "Lyric Love," and the rare gold-ring of verse of his poet bride, Elizabeth Barrett Browning: a lady of high scholarship, familiar with the classics of ancient and modern tongues, the greatest of all England's poetesses, but with her memory treasured still more lovingly as wife and mother.

And so it is when we turn from real to mimic life, and look on Shakespeare's Portia: no longer the barrister in doctor's robes; but the true wife, by whom, only to rescue her husband's friend, had they been assumed. There are, indeed, such occasions in real life, as well as in the world of fiction, when an Elizabeth Fry, or a Florence Nightingale, may overstep the ordinary limits of woman's true vocation, and yet justify the act by its results. Of such we may fitly exclaim, in Portia's words:—

> "How many things by season season'd are
> To their right praise and true perfection."

Nevertheless the aim of higher culture for either man or woman, is not to develope such exceptional nobility; but by maturing their reasoning faculties, and widening their range of thought, to fit them better for every worthy aim and duty of life.

And now permit me to refer for a moment to my own special theme. In selecting from the wide field of English Literature, a department capable of being turned to useful account within the very brief limits of twenty lectures, I propose, while tracing out in some degree, the growth of the language, to note the national growth itself, as mirrored in the three great ages of English letters: that of Chaucer, of Shakespeare, and of Pope. And in doing so nothing will be more obvious

than the fallacy of the popular idea, which conceives of the poet as an unpractical dreamer, living apart from all the daily round of homely duties: apostrophising the stars; courting glimpses of the moon; or inditing sonnets to his mistress's eye-brows. The greatest poets have been among the most practical of men, and none more so than Chaucer, Shakespeare, and Milton. In truth, while it is well to find in the common round of daily life employment for those who appear to have no capacity for higher things: no idea is more opposed to the world's experience than that they best perform those duties on which so much of the happiness of wise men and women depends. When Wordsworth dedicates one of his noble sonnets to Milton, his climax shows his own estimate of such duties:—

"Thy soul was like a star, and dwelt apart;
Thou hadst a voice whose sound was like the sea;
Pure as the naked heavens, majestic, free:
So didst thou travel on life's common way
In cheerful godliness; and yet thy heart
The lowliest duties on herself did lay."

Perhaps it may seem to some of you that in an inaugural address for a scheme of higher education, these "lowliest duties" might have been left unnoticed, as wholly outside of all we have now in view. Yet, therein lies the fancied impediment; the lion in our path: all the more difficult to combat because it is a mere creation of the fancy. There is indeed a class of men to be found, who speak, with seeming earnestness, as though some few additional improvements on the sewing machine were all that is needed to make a perfect world without woman at all. But such cynics may fitly be left to their own mechanical resources. Nor is there much more need that I should combat prejudices of men of higher intelligence. It is your own prejudices that have to be overcome. In the prologue to "The Princess," Lilia answers to the pictured nobleness of woman in the Olden Time, when asked: "Lives there such a woman now?"

"There are thousands now,
Such women, but convention beats them down;
It is but bringing up: no more than that;
You men have done it. * * *
* * * I would shame you all,
That love to keep us children."

But Lilia is unjust. It is yourselves, not us, who do so: enlisting your own prejudices on the side of inferior education. There is in the

very nobleness of true womanhood so strong a sense of duty, that she learns to look with jealousy on any movement that seems to tempt her away from those ministering services which will constitute her most honourable vocation while the world endures. It is not therefore, unmeet that I should aim by every argument to enforce the idea that, as high culture and profound scholarship interfere in no degree with man's fitness for the roughest and most prosaic duties; but rather that the cultivated intellect quickens into renewed vigour every inferior power: so is it with woman also. The development of her highest faculties, her powers of reasoning, her range of observation, and compass of knowledge, will only make mind and hand work together the more promptly, in obedience to every tender impulse, and every voice of duty.

Once satisfied of this, I doubt not your hearty coöperation may be relied upon: without which all efforts on our part for the higher education of woman must be vain. Yet I feel assured that, in spite of every impediment, such a scheme lies among the inevitable purposes of the future. It may be rejected now; it may be delayed and frowned on still by the prejudices inherited from a dead past; but it cannot be prevented. It is one of the grand promises which make thoughtful men almost envious of those who are now entering on the life, for some of us so nearly an accomplished thing.

> "Its triumphs will be sung,
> By some yet unmoulded tongue,
> Far on in summers that we shall not see."

The thoughts of men are widening; and we stand in special need of this as an element which will accelerate the world's progress onward and upward to noblest ends. Whether or no this generation shall, in our own province at least, share in any degree in the effort, or partake of its rewards, rests mainly with yourselves.

THE AURORA AND THE SPECTROSCOPE.

Those who are in the habit of watching the splendid auroral displays occasionally witnessed in Canada, will read with interest the following article from the London *Spectator*:—

"Men of science have long felt that a strange secret lay hidden in the brilliant folds of the aurora. The magic arch, with its pointed streamers, shifting silently but swiftly across the heavens, pulsating mysteriously as though illuminated by the fitfully changing glow of some concealed furnace, and rendered supassingly beautiful by the brilliancy of its colours, has

always had strange charms for men of thoughtful mind. And gradually a series of laborious researches had revealed the laws which associate this beautiful apparition with disturbances affecting the economy of our whole earth, and not indistinctly connected with the habitudes of the solar system itself. But recently a discovery has been made which is even more remarkable than any which had before rewarded the labours of physicists—a discovery at once instructive and perplexing, revealing a bond of union between the aurora and a phenomenon hitherto thought to be quite different in character, but leaving us still to learn what the exact nature of that bond of union may be. We had occasion recently to point out that a sudden disturbance in the sun in 1859 had been presently followed by intense magnetic action, the whole electric system of the earth quivering, so to speak, under the influence of the solar forces educed by the disturbance. And we mentioned that amongst the signs of this magnetic action brilliant displays of the auroral streamers had been witnessed in both hemispheres on the night following the solar disturbance. This circumstance teaches us the true character of the aurora as strikingly as any which astronomers and physicists had patiently been gathering together during the past half century. We learn at once that a relation subsists between the aurora, terrestrial magnetism and the central luminary of our scheme. When our skies are illuminated by the magic streamers, we may be sure that those of Venus and of Mars, of Jupiter and of Saturn, nay, even the skies of those unseen orbs which travel far out in space beyond the paths of Uranus and Neptune, are lit up with auroral displays. When once it has been shown that we owe our auroras to solar action, we recognise the cosmical character of the display, and that, in a sense, the terrestrial magnetism on which it depends is a bond of affinity between our earth and its sister orbs. The auroral lights are undoubtedly to be ascribed to electric action taking place at a very considerable height, where the air is very rare indeed. It became, therefore, a question whether anything could be learned by analysing the auroral light, as the condition of that particular part of our atmosphere in which the electric action takes place. Spectroscopic analysis, that strange and powerful mode of research which has revealed so many unlooked-for facts, was accordingly applied to the light of a brilliant aurora. The result was rather surprising. Instead of a rainbow-coloured streak of light, such as would have appeared if the aurora were due to the existence of particles excited to luminosity by electric action, a single line of coloured light appeared. This indicated that the light is due to the incandescence of some gas through which the electric discharges in upper air take place. But this was not the circumstance which attracted surprise. Rather, this was to have been looked for. It was the *position* of the line which astonished our physicists. If the gas had been one which chemists are acquainted with, the bright line would have occupied the position proper to that gas, and would at once have indicated its nature. But there is no known ele-

ment whose spectrum has a bright line where this one appeared. The observation has been repeated over and over again, by Angstrom, by Otto Struve, and recently by Mr. Plummer, always with the same result,—we cannot tell what the substance may be to whose incandescence or luminosity the aurora owes its brilliancy. But now a most remarkable discovery has been effected. Angstrom has found that the mysterious line of the auroral spectrum exists in the spectrum of another object which had been thought to be wholly different in character. Ever since its discovery by Cassini, the zodiacal light has been an object of interest to astronomers. Gradually a theory had been formed respecting it, which had been sanctioned by the authority of such men, as Humboldt and Sir John Herschel. It was held that this appearance is due to the light reflected from a number of minute cosmical bodies travelling around the sun within the orbit of our earth. This theory had never been tested by spectroscopic analysis. Indeed, the zodiacal light shines so faintly that it was hardly hoped its spectrum could be rendered visible. But it was confidently anticipated that if the zodiacal light ever were thus analysed, its spectrum would be that which the theory required—that is, a very faint reproduction of the common solar spectrum. Now, at length, we hear from Angstrom, that the spectrum of the zodiacal light has been observed, and instead of being, as had been expected, a faint rainbow-coloured streak, it presents but a single line. *That line is the same that we see in the spectrum of the aurora!* In other words, the light of the zodiacal gleam and that of the auroral streamers are due to the same sort of electric discharge taking place in the same medium. Without pretending to further interpret this startling result, we may indicate the promise it affords of explaining a number of phenomena which have long seemed most perplexing. When once we recognise the fact that electric action is effective in producing any of the celestial lights, we have a resource available to remove many difficulties. Astronomers were asking how comets, for example, could exhibit the spectrum of the incandescent vapour of carbon—that is, a spectrum indicative of the most intense heat, when, as in the case of Winneck's comet (whose spectrum was of this nature), they were farther from the sun than the earth is. The action of the sun in exciting electrical discharges would be quite sufficient to account for this and similar phenomena. Again, it has long been recognised that the peculiarities of comets' tails seem only explicable as due to electrical action; but astronomers were unwilling to adopt such a theory without some positive evidence in its favour. We now have such evidence; and it is most probable that the first long-tailed comet which is submitted to spectroscopic analysis will establish the view which Euler put forth more than half a century ago, that comets' tails have something in common with the aurora and the zodiacal light. It would indeed be strange if three of the most mysterious phenomena with which men of science are acquainted should find their explanation simultaneously.

BOOK NOTICE.

HISTORY OF THE SETTLEMENT OF UPPER CANADA (ONTARIO), WITH SPECIAL REFERENCE TO THE BAY [OF] QUINTÉ. By Wm. CANNIFF, M.D., M.R.C.S.E., Professor of Surgery, University of Victoria College, Author of the "PRINCIPLES OF SURGERY." Toronto: Dudley & Burns, Printers, 1869. 8vo. pp. xxxii., 671.

Several attempts have been made from time to time in Upper Canada to form Historical Societies, but nothing as yet very tangible has come of them. In the United States such associations abound and are creditably sustained. The following are some of them; The Massachusetts Historical Society; The New England Historico-Genealogical Association; The New Hampshire Historical Society; The Rhode Island ditto; The Long Island ditto; The Iowa ditto; The Chicago ditto. The Canadian Institute receives regularly the Reports issued by a general institution of this class, the American Antiquarian Society. The publications put forth by these and a number of other associations of a similar kind, together with such works as Lossing's Field Books of the Revolution, and of the War of 1812, are likely to preserve for the benefit of future generations in the United States much information relative to early settlements that would otherwise have been wholly lost.

Although, however, our Upper Canadian Historical Societies have proved somewhat abortive, they have nevertheless given rise to some publications of importance. The volume, whose title is to be seen above, for example, has grown out of a paper prepared by Dr. Canniff, at the request of a Society organized at St. Catharines a few years ago. It treats especially of the first settlement of the country in the neighbourhood of the Bay of Quinté, a region of peculiar interest to the author, as being the place of his birth. The work opens with a sketch of Franco-Canadian History, and then proceeds with a narrative of the revolt of the Colonies which now constitute the United States of North America, that revolt having led to the immigration to Western Canada of many of its first inhabitants. The field traversed thus extends beyond Canadian bounds, and is sufficiently wide. The specimens we shall give of the style and contents of the volume will consist of a few paragraphs descriptive of the several classes of refugees during the period, 1784–1790, with some account of their discouragements and encouragements, and modes of proceeding, on first entering the wilderness:—

THE FIRST SETTLERS.

"The settlers of Upper Canada, up to 1790, may be divided into those who were forced away from the States by persecutions, during and after the war; the disbanded troops; and a nobler class, who left the States, unwilling to live under other than British rule.

"To what extent were these pioneers fitted to enter upon the truly formidable work of creating homes, and to secure the necessaries of life for their families? But few of them possessed ought of worldly goods, nearly all were depending upon the bounty of Government. In the first place, they were supplied with rations; which consisted of flour, pork, and a limited quantity of beef, a very little butter, and as little salt.

"They were also supplied with 'clothes for three years, or until they were able to provide these articles for themselves. They consisted of coarse cloth for trowsers and Indian blankets for coats, and of shoes; beside, each received a quantity of seed grain to sow upon the newly cleared land, with certain implements of husbandry. To each was allowed an axe, a hoe, and a spade; a plough, and one cow, were allotted to two families: a whip and cross-cut saw to every fourth family; and, even boats were provided for their use, and placed at convenient points;' and 'that nothing might seem to be wanting, on the part of the Government, even portable corn mills, consisting of steel plates, turned by hand like a coffee-mill, were distributed among the settlers.' We have learned they were also supplied with nails, hand-saws and other materials for building. To every five families were given a 'set of tools,' such as chisels and augers, of various sizes, and drawing-knives; also pick-axes, and sickles for reaping. But, unfortunately, many of these implements were of inferior quality. The axe, with which the burden of the work was to be done, was unlike the light implement now in use, it was but a short-handled ship axe, intended for quite a different use than chopping trees and clearing land. Notwithstanding, these various implements, thoughtfully provided by Government, how greatly must they have come short in meeting the varied wants of the settler, in his isolated clearing, far separated from places whereat things necessary could be procured. However, the old soldier, with his camp experience, was enabled by the aid of his tools, to make homely and rude articles of domestic use. And, in farming, he constructed a rough, but servicable plow, and harrow, and made handles for his scythe.

"Thus provisioned and clothed, and thus armed with implements of industry, the old soldiers advanced to the attack of a last enemy, the wild woods. Unlike any previous warfare, was this lifetime struggle. With location ticket in hand, they filed into the batteaux to ascend the rapids. A certain number of batteaux joined together, generally about twenty or twenty-five, formed a brigade, which was placed under the command of a suitable officer; if not one who had in previous days, led them against the foe. It is quite impossible to conceive of the emotions which found a place in the breasts of the old veterans as they journeyed along wearily from day to day, each one bringing them nearer to the spot on which the tent was to be pitched for the last time. Eagerly, no doubt, they scanned the thickly wooded shores as they passed along. Curiously they examined the small settlement, clustering around Cataraqui. And, it cannot be doubted, when they entered the waters of the lovely Bay of Quinté, the beauty of the scene created a feeling of joy and reconciliation to their lot, in being thus cast

upon a spot so rich in natural beauty. These disbanded soldiers, at least each family, had a canvas tent capable of accommodating, in a certain way, from eight to ten persons. These were pitched upon the shore, at first in groups, until each person had learned the situation of his lot, when he immediately removed thereto. But there were by no means enough tents to give cover to all, and many had only the friendly trees for protection. The first steps taken were to clear a small space of trees, and erect a place of habitation. We have seen what were the implements he had to work with—the materials he must use to subdue the forest tree standing before him.

"Here, at the very threshold of Upper Canadian history, was initiated the 'institution' of 'bees.' 'Each with his axe on his shoulder, turned out to help the other,' in erecting a log shanty. Small and unpretending indeed, were these humble tenements first built along the shores of the bay. The size of each depended upon the number to occupy it. None were larger than twenty by fifteen feet; and an old man tells me that his father, who was a carpenter, built one fifteen feet long and ten feet broad, with a slanting roof seven or eight feet in height. The back-woodsman's shanty, which may ye' be seen in the outskirts of our country, is the counterpart of those which were first built; but perhaps many of our readers may never have seen one. 'Round logs,' (generally of basswood,) 'roughly notched together at the corners, and piled one above another, to the height of seven or eight feet, constituted the walls. Openings for a door, and one small window' (always beside the door) 'designed for four lights of glass, 7 × 9, were cut out,' (Government had supplied them with a little glass and putty;) 'the spaces between the logs were chinked with small splinters, and carefully plastered outside and inside, with clay for mortar. Smooth straight poles were laid lengthways of the building, on the walls, to serve as supports of the roof. This was composed 'of strips of elm bark, four feet in length, by two or three feet in width, in layers, overlapping each other, and fastened to the poles by withes.' (The roof was sometimes of black oak, or swamp oak, bark,) 'with a sufficient slope to the back, this formed a roof which was proof against wind and weather. An ample hearth, made of flat stones, was then laid out, and a fire back of field stone or small boulders, rudely built, was carried up as high as the walls. Above this the chimney was formed of round poles, notched together and plastered with mud. The floor was of the same materials as the wall, only that the logs were split in two, and flattened so as to make a tolerably even surface. As no boards were to be had to make a door, until they could be sawn out by the whip-saw, a blanket suspended from the inside for some time took its place. By and by four little panes of glass, were stuck into a rough sash, and then the shanty was complete.'

"Furniture for the house was made by the old soldier; this was generally of the roughest kind. They had the fashion of exchanging work, as well as of having bees. Some of them had been mechanics in other days. A carpenter was a valuable acquisition, and while others would assist him to do his heavy work, he would in return do those little nicer jobs by which the household comforts would be increased. No chests of drawers were required; benches were made of split basswood, upon which to sit, and tables were manufactured in the same style. The bedstead was constructed at the end of the cabin, by taking poles of suitable size and inserting the ends between the logs which formed the walls on either side. These would be placed, before the cracks were filled in and plastered."

CLEARING THE LAND.

"A log hut constructed, wherein to live; and such plain rough articles of furniture as were really necessary provided, the next thing was to clear the land, thickly covered with large trees and tangled bush. Many a swing of the unhandy axe had to be made ere the trees could be felled, and disposed of; and the ground made ready for the grain or root.

"A few years later, and the settler would, in the dry summer season, fire the woods, so as to kill the trees. By the next year they would have become dry, so that by setting fire again they would burn down. In this way much labour was saved. But sometimes the fire would prove unmanageable and threaten to destroy the little house and log barn, as well as crops. Another mode of destroying the large trees, was to girdle them—that is, to cut through the bark all around the tree, whereby it was killed, so that the following year it would likewise burn down.

"A portion of the disbanded troops, as well as other loyalists, had been bred to agricultural pursuits; and some of them, at least those who had not been very long in arms, could the more readily adapt themselves to their new circumstances, and resume their early occupation. The axe of the woodsman was soon swung as vigorously along the shores of the well wooded river and bay, as it had been in the forests years before, in the backwoods of New England.

"It is no ordinary undertaking for one to enter the primeval forest, to cut down the tough-grained trees, whose boughs have long met the first beams of the rising sun, and swayed in the tempest wind; to clear away the thick underbrush, which impedes the step at every turn; to clear out a tangled cedar swamp, no matter how hardy may be the axe-man—how well accustomed to the use of the implement. With the best mode of proceeding, with an axe of excellent make, and keen edge; and, combined with which, let every other circumstance be favourable; yet, it requires a determined will, an iron frame and supple muscle, to undertake and carry out the successful clearing of a farm. But, the refugees and disbanded soldiers, who formed the pioneers of Upper Canada, enjoyed not even ordinary advantages. Many of the old soldiers had not the slightest knowledge of the duties of pioneer life, while others had but an imperfect idea. Some scarcely knew how to fell a tree. Hardy and determined they were; but they possessed not the implements requisite to clear off the solid trees. We have seen that the axe furnished by government was large and clumsy, and could be swung only with difficulty and great labour, being nothing more than the ship axe then in use. Slow and wearisome indeed, must have been the progress made by the unaccustomed woodsman in the work of clearing, and of preparing the logs for his hut, while he had, as on-lookers, too often a feeble wife and hungry children. * * * * *

"Although deprived of all those comforts, which most of them had enjoyed in early life in the Hudson, and Mohawk valleys, and fruitful fields of Pennsylvania, they toiled on determined to conquer—to make new homes; and, for their children at least, to secure comforts. They rose early, and toiled on all day, whether long or short, until night cast its solemn pall over their rude quiet homes. The small clearing of a few acres gradually widened, the sound of the axe was heard ringing all the day, and the crash of the falling tree sent the startled wild beast to the deeper recesses of the wild wood. The toilers were not all from the same social rank, but now in the

main, all found a common level; the land allotted to the half-pay officers was as thickly covered with wood. A few possessed limited means, and were able to engage a help, to do some of the work, but in a short time it was the same with all; men of education, and who held high positions, rightly held the belief that it was an honour to be a refugee farmer.

"At the close of the war a considerable number of the refugees found safety in New Brunswick and Nova Scotia. But a certain number, not finding such prospects as they had hoped, resolved to try Canada. Consequently, for five or six years after the peace, this class continued slowly to flow, to swell the number of inhabitants of Upper Canada. Some of them tarried, or remained in Lower Canada; but the majority ascended the Bay of Quinté, and settled the new townships at the head of the bay; not a few would remain for a year or two in the townships already settled, 'working farms on shares, or 'living out,' until the future home was selected. A good many of the first settlers in the sixth, seventh, and eighth townships, had previously lived for awhile in the fourth township.

"The advance of the settlements was along the bay, from Kingston township and Earnest town, westward along both sides. When the settlers in the first, second, third and fourth townships, had, to a certain extent overcome the pioneer's first difficulties, those in the sixth, seventh, eighth, and ninth, were yet undergoing mostly all the same hardships and trials. Far removed from Kingston, they could, with difficulty, procure necessities, and consequently endured greater privation, and experienced severer hardships; but in time these settlers also overcome, and ended their days in comparative comfort."

What Dr. Canniff has accomplished in the volume before us for the district and region of his birth, we should like to see done by competent persons elsewhere. The Bay of Quinté region is but one of the sections of Upper Canada taken possession of and brought into cultivation at an early period. We have the Niagara District, the Home District, the Talbot Settlement, the Huron Tract. Each of these areas might furnish an industrious writer with the materials for a volume. Early local annals are not only interesting to the inhabitants of the several regions in all subsequent time, but are also often of great use to the general historian. Every year, however, that such collections remain unmade, the difficulty manifestly increases, of rendering them as full and complete as they ought to be.

Whenever a second edition is demanded by the public we should advise a thorough revision of Dr. Canniff's work. The eye, at present, is offended by flagrant misprints. The diction in several places wants correction and finish. Our neighbours over the southern border are sometimes spoken of in the strain of a by-gone age. These ebullitions might with advantage be omitted or recast. The very singular and unaccountable mutilation of the fine old historic name *Bay of Quinté* should also certainly be remedied, wherever it occurs. This blemish is

not uniformly to be seen throughout the volume; but it unhappily appears on the title page. Appellations like *Bay of Quinté, Bay of Chaleurs, Bay of Fundy*, imbedded in our every day speech, and associated with many a story of adventure in primitive Canadian life, must not be tampered with. A vicious rapidity of enunciation, noticeable occasionally in the rural districts of Canada, may produce to the ear the sound *Bay Quinté* (which we cannot refrain from saying, is to ourselves something dreadful; Anglicised too, as probably, at the same time, *Quinté* would be). But the intention of the speaker, in such a case, is not to drop the "of." He in fact does not omit it, but gives it the obscure sound represented by *o'* in such expressions as John o'Groat, Jack o'Lantern, Ten o'clock; which are expressions purely popular, not to be countenanced in the educated speech of the present day, except in sport; not to be copied in the deliberate formation of local or personal names; and above all, in written and printed English of a serious character, not to be obtruded on the eye, in an additionally-clipped condition. H. S.

CANADIAN INSTITUTE.

(Continued from p. 262.)

THE TREASURER'S ACCOUNT.

The Treasurer in Account with the Canadian Institute for the year 1867-68, *from* 1*st December*, 1867, *to* 30*th November*, 1868.

DEBTOR.

Cash Balance last year		$26 8
" Received from Members		331 00
" " for Rent		71 25
" " for Interest on Loan of $3,100, to 30th Nov., 1867		186 00
" " Parliamentary Grant, 1868		750 00
" " for sale of Journal..... { Old Series.. $3 00 / New " .. 00 75 }		3 75
Securities		3,100 00
		$4,468 08

CREDIT.

Cash paid for Printing Journal, Vol. XI., No. 66, Dec., 1867.			$82 75
" Editor Journal, Vol. XI.			240 00
" Library and Museum			91 25
" on Account of Institute:—			
Salary	$336 00		
Insurance	102 25		
Wood	63 25		
Printing and Engrossing	14 50		
Repairs, &c.	73 70		
Postage, $2.22c.; oil, $1.90c.; cabs, $1.70c.; brooms, 50c.; express, 90c.; lamp, 13c.; dusters, 15c.; gum, 10c.; axe, $1.75c.; whitewashing, $1.25c.; chimney-sweeping, 60c.; flour, 5c.	12 25	601 95	
Securities			3,100 00
Cash in hand			352 13
			$4,428 08

SAMUEL SPREULL,
Treasurer.

Toronto, 1st December, 1868.

The undersigned Auditors have compared the Vouchers for the above items with the Cash Book, and find them to agree. The balance in hands of Treasurer at date above given is three hundred and fifty-two dollars thirteen cents.

G. H. WILSON,
W. J. MACDONELL, } *Auditors.*

DONATIONS OF BOOKS, &c., RECEIVED SINCE LAST ANNUAL REPORT.

From the Smithsonian Institute.

Contributions to Knowledge, Vol. XV., 1867 .....

From Prof. J. Hall, Albany.

Twentieth Annual Report of the Regents of the University of the State of New York, on the Condition of the Cabinet of Natural History, 15th April, 1867 .....

From J. Churchill & Sons, London.

On the Principles of Aesthetic Medicine.....

From Gustave Bossange, Paris.

Meteorological Observations made at Madrid, in Spain, 1867.....

From United States Patent Office.

Patent Office Report for Year 1866 .....

PAMPHLETS.

From Koninklijk Nederlandsch Meteorlogisch Institute.

Catalogue des Livres Publiés en Langues Etrangeres par L'Academie Imperiale des Sciences de St. Petersbourg, &c., 1867 .....

Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine Zu Bremen, 1 Bd. 2 Heft., C. Ed. Müller, 1867 .....

Catalogus Plus Quam 10,000 dissertationum et Orationum Juridicarum, &c., Apud Fredericum Muller Bibliopolam Amstelodami, 1867.....

Catalogus Plus Quam 2,700 dissertationum et orationum Theologicarum, &c., Apud Fredericum Muller Bibliopolam Amstelodami, 1867 .....

From R. A. Harrison, M.P.

Miscellaneous Statistics of Canada, year 1866 .....

Report of the Commissioner of Crown Lands of Canada, year 1866 .....

From Scientific Society, University College.

Inaugural Address Literary and Scientific Society, University College, 1866,

From Mining Department.

Report of the Chief Commissioner of Mines for the Province of Nova Scotia..

From the Royal University of Norway.

Norwegian Buildings from former times, 1866 .....

Etudes sur les Affinites Chimiques, par l. m. Guldberg et P. Waage .....

Foreningen til Norske Fortidsmindesmerkers Bevaring Aarsberetning, for 1866 .....

Index Scholarum in Universitate Regia Fredericiana Centesimo Octavo Ejus Semestri, 1867.....

Ditto, Nono ditto, 1867 .....

Generalbereting fra Gustad Sindssygeasy for Aaret 1866 .....

Beretning om Bodsfoengslets i Aaret, 1866.....

Det Kongelige Norske Frederiks Universitets for Aaret 1866 .....

Forhaudlinger i Videnskabs-Selskabet i Christiania Aar. 1865, Med 3 lithographerede Plade.....

Ditto, ditto, Aar. 1866, Med. 2 ditto .....

Ny Magazin for Naturvidenskaberne Udgives afden physiographiske Forening, i Christiania ved M. Sars, og Th. Kjerulf, Femtende Binds forste Hefte, 1866 .....

Ditto, ditto, Femtende Binds audit Hefte Christiania, 1867 .....

Meteorologiske Jagttagelser det Sydlige Norge, 1863-'64-'65-'66.

Udgivne af det kongelige norske Frederiks Universitet ved det Norske Meteorologiske Institut, Christiania, 1867 1
Ditto, ditto, Paa Fem telegrafstationer ved Norges Kyst Redercurde og Sammenstillede af J. J. Astrand Bestyrer af Bergens observatorium, Forste og Auden Aargang, &c. &c. 1
Meteorolgiske Jagttagelser Paa Christiania Observatorium, 1866 1
Morskinskinna: Pergamentsbog fra Forste Halvdel, &c., R. Unger, Christiania, 1866 1
Forelaesningar och Ofniugar vid Carolinska Universitet tet i Lund Hosttermineu, 1865 1
Acta Universitatis Lundensis, Lunds Universitets Ars-Skrift, 1865,—
Mathematik och Naturvetenskap 1
Ratts-och Stats Veteuskap..... 1
Philosophi Sprakvetenskap Och Historia 1

From the Author.

Investigations of a Naturalist between Mingan and Watchicouti, Labrador, by Wm. Couper, Vice-President Quebec Branch Entomological Society of Canada, Quebec, 1868 1

Unknown—Supposed from the Author.

A new Resolution of the Diameters and Distances of the Heavenly Bodies by common Arithmetic, accompanied with an Exhibit of the Variations of the Astronomers, and a Disproof of the Newtonian Theory of Universal Gravitation, by W. Isaacs Loomis, Piermont, Rockland Co., N. Y..... 1
Discovery of the Origin of Gravitation and the Majestic Motive Force which generated the Diurnal and Yearly Revolutions of the Heavenly Bodies, in two Parts, by W. Isaacs Loomis 1

Unknown.

Catalogue de Dunod, Editeur: Ponts et Chaussees, Paris..... 1

From Dr Hugel, Leipsig.

Verhandlungen des Naturforschenden Vereines in Brunn, V Band, 1866 1

From the Society.

Annual Report of the Minnesota Historical Society, read at the Annual Meeting, January 20, 1868..... 1

From McGill College.

Annual Calendar, McGill College, Montreal, Session 1868-'69 1

From the Chicago Historical Society.

Tenth Annual Statement of the Trade and Commerce of Chicago, for the year ending 31st March, 1868 1

From the Society.

Annual Report of the Leeds Philosophical Society, 1867-'68 1

From the Geological Survey of India.

Palæontologia Indica. Figures and Descriptions of the Organic Remains procured during the progress of the Geological Survey of India, &c.... 1
V. 1-4, The Gastropoda of the Cretaceous Rocks of Southern India, by Fred. Stoliczka, Ph. D. 1867.
Catalogue of the Meteorites in the Museum of Calcutta, 1867 1
Annual Report of the Geological Survey of India, and of the Museum of Geology of Calcutta, Eleventh Year, 1866-'67 1
Memoirs of the Geological Survey of India, Vol. VI., Part I.:
Blandford, W. T., On the Neighbourhood of Lynyan, &c., in Sind.... 1
" " On the Geology of a Portion of Cutch.....

Memoirs of the Geological Survey of India, Vol. VI. Part II:
Hughes, T. W. H., On the Bokaro Coal Fields 1
Ball, V., On the Ramghur Coal Field.. .....
Blandford, W. T., On the Traps of Western and Central India .....

From the Linnean Society.

List of the Society, 1867 1
The Journal of Proceedings (Session, 1866–'67, *Nov. 14*) 1
The Journal of the Society—Vol. IX., Zoology, Nos. 36, Sept. 14, 1867, to No. 40, April 23, 1868; Vol. X., Nos. 41 (May 30th), and 42, August 7 7
" " *Botany*, Vol. IX., No. 40, *Aug.* 23, 1867 1
" " " Vol X., No. 41, Sept. 5, 1867, and Nos. 42, Feb. 21, 1868, to No. 47, June 23, 1868 7
Vol. IX. *March* 19, 1868. The Title, Contents and Index to Vol. IX..... 1

From the Author.

Scritti Varii di Cristofori Negri, Torino, 1867 1
Relazione del Presidente Com. Cristoforo Negri Sullo Stato della Societa Geografica Italiana al 22 Guigno, 1868, &c. 1
Discorso del Comm. Cristoforo Negri, Rieletto Presidente della Societa Geografica nell Adunanza, del 25 Gennaio, 1868 1

From the Dublin University Zoological and Botanical Association.

Proceedings of—
Vol. I., Part 3, Nov. 1859; Vol. II., Part 1, Nov. 1860 2
Natural History Review and Quarterly Journal of Science, No. 4, Vol. VI., Oct. 1859; Nos. 25, 26, 27 and 28, Vol. VII..... 5

In Exchange for Journal.

Journal of the Society of Arts, 1868 2
" of Education, Upper Canada (Ontario), 1868 1
" Franklin Institute, Philadelphia, 1868 1
The Artizan, London, 1868 1
Silliman's Journal, New Haven, 1868 1
Proceedings American Antiquarian Society, Boston, 1868 1
" Academy of Sciences, Philadelphia, 1868 1
" Boston Natural History Society, 1868 1
Historical Recollections, Essex Institute, 1868 1
Annales des Mines, Paris, 1868..... 1
Pharmaceutical Journal, 1868 1
Journal Royal Dublin Society, 1868 1
Transactions Academy Sciences, St. Louis, 1868 1
Annals of the Lyceum of Natural History, New York, 1868 1
Proceedings Philosophical Society of Glasgow, 1868 1
Anthropological Review, 1868 1
Transactions of the Royal Society of Edinburgh, 1867 1
Canadian Naturalist, 1868..... 1
Journal of Dental Science, 1868 1
Canadian Entomological Journal, 1868 1
Proceedings of the Royal Physical Society, Edinburgh, 1862–1865 1

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

(*Continued from page 262.*)

BY THE REV. DR. SCADDING.

XIV.—KING STREET, FROM CHURCH STREET TO GEORGE STREET.

We were arrested in our progress on King Street by St. James's Church. Its associations, and those of the District Grammar School and its play-ground to the north, have detained us long. We now return to the point reached when our recollections compelled us to digress. Before proceeding, however, we must record the fact that the break in the line of building on the north side of the street here, was the means of checking the tide of fire which was rolling irresistibly westward, in the great conflagration of 1849. The energies of the local fire-brigade of the day had never been so taxed as they were on that memorable occasion. And from steam-power was then undreamt-of. Simultaneous outbursts of flame from numerous widely-separated spots had utterly disheartened every one, and had caused a general abandonment of effort to quell the conflagration. Then it was that the open space about St. James's Church saved much of the town from destruction. To the west, the whole sky was, as it were, a vast canopy of meteors streaming from the east. The church itself was consumed, but the flames advanced no further. A burning shingle was seen to become entangled in the buffer-boards of the belfry, and slowly to ignite the woodwork there: from a very minute start at that point, a stream of fire soon began to rise—soon began to twine itself about the upper stages of the tower, and to climb nimbly up the steep slope of the spire, from the summit of which it then shot aloft into the air, speedily enveloping and overtopping the golden cross that was there. At the same time the flames made their way downwards within the tower, till the internal timbers of the roofing over the main body of the building were reached. There, in the natural order of things, the fire readily spread; and the whole interior of the church, in the course of an hour, was transformed before the eyes of a bewildered multitude looking powerlessly on, first into a vast "burning fiery furnace," and then, as the roof collapsed and fell, into a confused chaos of raging flame. The heavy gilt cross at the apex of the spire came down with a crash, and planted itself in the pavement of the principal entrance below, where the steps, as well as the inner walls of the base of the tower, were bespattered far and wide with the molten metal of the great bell. While the work of destruction was going fiercely and irrepressibly on, the Public Clock in the belfry, Mr. Draper's gift to the town, was heard to strike the hour as usual, and the quarters thrice—exercising its functions and having its appointed say, amidst the sympathies, not loud but deep, of those who watched its doom; bearing its testimony, like a martyr at the stake, in calm and unimpassioned strain, up to the very moment of time when the deadly element touched its vitals.

Opposite the southern portal of St. James's Church was to be seen, at a very early period, the conspicuous trade-sign of a well-known furrier of York, Mr. Joseph Rogers. It was the figure of an Indian Trapper holding a gun, and accompanied by a dog, all depicted in their proper colours on a high, upright tablet set over the doorway of the store below. Besides being an appropriate symbol of the business carried on, it was always an interesting reminder of the time, then not so very remote, when all of York, or Toronto, and its commerce that existed, was the old French trading-post on the common to the west, and a few native hunters of the woods congregating with their packs of "beaver" once or twice a-year about the entrance to its picketted enclosure. Other rather early dealers in furs in York were Mr. Jared Stocking and Mr. John Bastedo. In the *Gazette* for April 25, 1822, we notice a somewhat pretentious

advertisement, headed "Muskrats," which announces that the highest market price will be given in cash for "good seasonable muskrat skins and other furs at the store of Robert Coleman, Esquire, Market Place, York" Mr. Rogers's descendants continue to occupy the identical site on King Street indicated above, and the Indian Trapper, renovated, is still to be seen - a pleasant instance of Canadian persistence and stability. In Great Britain and Europe generally, the thoroughfares of ancient towns had, as we know, character and variety given them by the trade-symbols displayed up and down their misty vistas. Charles the First gave, by letters patent, express permission to the citizens of London "to expose and hang in and over the streets, and ways, and alleys of the said city and suburbs of the same, signs and posts of signs, affixed to their houses and shops, for the better finding out such citizens' dwellings, shops, arts and occupations, without impediment, molestation or interruption of his heirs or successors" And the practice was in vogue long before the time of Charles. It preceded the custom of distinguishing houses by numbers. At periods when the population generally were unable to read, such rude appeals to the eye had, of course, their use. But as education spread, and architecture of a modern style came to be preferred, this mode of indicating "arts and occupations" grew out of fashion. Of late, however, the pressure of competition in business has been driving men back again upon the customs of by-gone illiterate generations For the purpose of establishing a distinct individuality in the public mind the most capricious freaks are played In our own streets we have, we believe, two feminine specimens of auro ligneous zoology, between which the sex is announced to constitute the difference. The lack of such clear distinction between a pair of glittering symbols of this genus and species, in our Canadian London, was the occasion of much grave consideration in 1867, on the part of the highest authority in our Court of Chancery. Although in that *cause celebre*, after a careful physiognomical study by means of photographs transmitted, it was allowed that there *were* points of difference between the two specimens in question, as, for example, that "one looked older than the other," that "one, from the sorrowful expression of its countenance, seemed more resigned to its position than the other"—still the decree was issued for the removal of one of them from the scene—very properly the later-carved of the two.—Of the ordinary trade-signs that were to be seen along the thoroughfare of King Street no particular notice need be taken. The Pestle and Mortar, the Pole twined round with the black strap, the Crowned Boot, the Axe, the Broad-axe, the Saw, (mill, cross-cut and circular,) the colossal Fowling-piece, the Cooking Stove, the Plough, the Golden Fleece, the Anvil and Sledge-Hammer, the magnified Horse Shoe, each told its own story, as indicating indispensable wares or occupations.

Passing eastward from the painted effigy of the Indian Trapper, we soon came in front of the Market Place, which, so long as only a low wooden building occupied its centre, had an open, airy appearance. We have already dwelt upon some of the occurrences and associations connected with this spot. On King Street, about here, the ordinary trade and traffic of the place came, after a few years, to be concentrated. Here business and bustle were every day, more or less, created by the usual wants of the inhabitants, and by the wants of the country farmers whose waggons in summer, and sleighs in winter, thronged in from the north, east and west. And hereabout at one moment or another, every lawful day, would be surely seen, coming and going, the oddities and street characters of the town and neighbourhood. Having devoted some space to the leading and prominent personages of our drama, it will be only proper to bestow a few words on the subordinates, the Calibans and Gobbos, the Nyms and Touchstones of the piece. From the various nationalities and races of which the community was a mixture, these were drawn. There was James O'Hara, for example, a poor humorous Irishman, a perfect representative of his class in costume, style and manner, employed as bellman at auctions, and so on. When the town was visited by the travelling cutters-out of likenesses in black paper (some years ago such things created a sensation), a full-length of O'Hara was suspended at the entrance to their rooms, recognized at once by every eye, even without the aid of the "Shoot easy" inscribed on a label issuing from the mouth. There was Jock Murray, the Scotch carter; and after him, William Pettit, the English one; and the carter who drove the horse with the 'spring-halt": (every school-lad in the place was familiar with the peculiar twitch upwards of the near hind leg in the gait of this nag.) The negro population was small. Every individual of colour was recognizable at sight. Black Joe and Whistling Jack were two notabilities: both of them negroes of African birth. In military bands a negro drummer or

cymbal-player was formerly often to be seen. The two men just named, after obtaining a discharge from a regiment here, gained an honest livelihood by chance employment about the town Joe, a well-formed, well-trained figure, was to be seen, still arrayed in some old cast-off shell-jacket, acting as porter, or engaged about horses: once already we have had a glimpse of him in the capacity of sheriff's assistant, administering the lash to wretched culprits in the market-place. The other, besides playing other parts, officiated occasionally as a sweep; but his most memorable accomplishment was a melodious and powerful style of whistling musical airs, and a faculty for imitating the bag-pipes to perfection.—For the romantic sound of the name, the tall, comely negress, Amy Pompadour, should also be mentioned in the record. But she was of servile descent: at the time of which we write slavery was only just dying out in Upper Canada, as we shall have occasion to note hereafter more at large.—Then came the "Jack of Clubs" Lord Thurlow, we are told, once enabled a stranger to single out in a crowd Dunning, afterwards Lord Ashburton, by telling him to take notice of the first man he saw bearing a strong resemblance to the "Jack of Clubs." In the present case it was a worthy trader in provisions who had acquired among his fellow-townsmen a sobriquet from a supposed likeness to that sturdy court-card figure. He was a short, burly Englishman, whose place of business was just opposite the entrance to the Market. So absolutely did the epithet attach itself to him, that late comers to the place failed to learn his real name: all which was good-humouredly borne for a time; but at last the distinction became burdensome and irritating, and Mr Stafford removed in disgust to New York.—A well-known character often to be seen about here, too, was an unfortunate English farmer of the name of Cowper, of disordered intellect, whose peculiarity was a desire to station himself in the middle of the roadway, and from that vantage-ground to harangue any crowd that might gather, incoherently, but always with a great show of sly drollery and mirthfulness.—On occasions of militia funeral processions, observant lads and others were always on the look-out for a certain prosperous old cordwainer of York, Mr. Wilson, who was sure then to be seen marching in the ranks, with musket reversed, and displaying with great precision and solemnity the extra-upright carriage and genuine toe-pointed step of the soldier of the days of George the Second. He had been in the regular army, and it was with pride and gusto that he exhibited the perfection to which he had in other days attained. The slow pace required by the Dead March gave the on-looker time to study the antique style of military movement thus exemplified.—It was at a comparatively late period that Sir John Smythe and Spencer Lydstone, poets, were notabilities in the streets. the latter, Mr. Lydstone, recognizable from afar by a scarlet vest, brought out, ever and anon, a printed broadside, filled with eulogiums or satires on the inhabitants of the town, regulated by fees or refusals received. The former, Sir John Smythe, found in the public papers a place for his productions, which by their syntactical irregularities and freedom from marks of punctuation, proved their author (as a reviewer of the day once observed) to be a man *supra grammaticam*, and one possessed of a genius above commas. But his great hobby was a railway to the Pacific, in connection with which he brought out a lithographed map. Its peculiarity was a straight black line conspicuously drawn across the continent from Fort William to the mouth of the Columbia. In a tract of his on the subject of this railway he provides, in the case of war with the United States, for steam communication between London in England and China and the East Indies, by "a branch to run on the north side of the township of Cavan and on the south side of Balsam Lake." "I propose this," he says, 'to run in the rear of Lake Huron and in the rear of Lake Superior, twenty miles in the interior of the country of the Lake aforesaid, to unite with the railroad from Lake Superior to Winnipeg, at the south-west main trading-post of the North-West Company." The document is signed "Sir John Smythe, Baronet and Royal Engineer, Canadian Poet, LL D., and Moral Philosopher."

The concourse of traffickers and idlers in the open space before the old Market Place were free of tongue, they sometimes talked, in no subdued tone, of their fellow-townsfolk of all ranks. In a small community every one was more or less acquainted with every one, with his dealings and appurtenances, with his man-servant and maid-servant, his horse, his dog, his waggon, cart or barrow. Those of the primitive residentiaries, to whom the commonalty had taken kindly, were honoured in ordinary speech with their militia-titles of Colonel, Major-Captain, or the civilian prefix of Mister, Honorable Mister, Squire or Judge, as the case might be, whilst others, not held to have achieved any special claims to deference, were named, even

in mature years, by their plain baptismal names, John, Andrew, Duncan, George, and so on. And then, there was a third marking-off of a few, against whom, for one vague reason or another, there had grown up in the popular mind a certain degree of prejudice. These, by a curtailment or national corruption of their proper prenomen, would be ordinarily styled Sandy this, Jock that. In some instances the epithet "old" would irreverently precede, and persons of considerable eminence might be heard spoken of as old Tom so-and-so, old Sam such-a-one. And similarly in respect to the sons and nephews of these worthy gentlemen. Had the community never been replenished from outside sources, few of them would to the latest moment of their lives, have ever been distinguished except by the plain John, Stephen, Allan, Christopher, and so on, of their infancy, or by the *Bill*, *Harry*, *Alec*, *Mac*, *Dolph*, or *Bob*, acquired in the nursery or school.. But enough has been said, for the present at least, on the humours and ways of our secondary characters, as exemplified in the crowd customarily gathered in front of the old Market at York. We shall now proceed on our prescribed route.

The lane leading northward from the north-west corner of Market Square used to be known as Stuart's Lane, from the Rev. George Okill Stuart, once owner of property here. On its west side was a well-known inn, The Farmers' Arms, kept by Mr. Bloor, who, on retiring from business, took up his abode at Yorkville, where it has curiously happened that his name has been attached to a fashionable street, the thoroughfare formerly known as the Concession Line.—The street running north from the north-east angle of Market Square, now known as Nelson Street, was originally *New Street*, a name which was commemorative of the growth of York westward. The terminal street of the town on the west, prior to the opening of this New Street, had been George Street. The name of "New Street" should never have been changed, even for the heroic one of Nelson. As the years rolled on, it would have become a quaint misnomer, involving a tale, like the name of "New College" at Oxford—a College nearly five hundred years old.

At a point about half-way between New Street and George Street, King Street was, in 1849, the scene of an election *fracas* which, in distant quarters, damaged for a time the good name of the town. While passing in front of the Coleraine House, an inn on the north side of the street, and a *rendezvous* of the unsuccessful party, some persons walking in procession, in addition to indulging in the usual harmless groans, flung a missile into the house, when a shot, fired from one of the windows, killed a man in the concourse below.—Owing to the happy settlement of numerous irritating public questions, elections are conducted now, in our towns and throughout our Provinces, in a calm and rational temper for the most part. Only two relics of evil and ignorant days remain amongst us, stirring bad blood twice a-year, on anniversaries consecrated, or otherwise, to the object. A generous-hearted nation, transplanted as they have been almost *en masse* to a new continent, where prosperity, wealth and honours have everywhere been their portion, would shew more wisdom in the repudiation than they do in the recognition and studied conservation of these hateful heir-looms of their race.

XV.—KING STREET—DIGRESSION INTO DUKE STREET.

On passing George Street, as we intimated a moment ago, we enter the parallelogram which constituted the original town-plot. Its boundaries were George Street, Duchess Street, Ontario Street (with the lane south of it), and Palace Street. From this, its old core, York spread westward and northward, extending at length in those directions respectively (under the name of TORONTO) to the Asylum and Yorkville, while eastward its developments—though here less solid and less shapely—were finally bounded by the windings of the Don. Were Toronto an old town on the European Continent, George Street, Duchess Street, Ontario Street and Palace Street, would probably be boulevards, shewing the space once occupied by stout stone walls. The parallelogram just defined represents "the City" in modern London, or "la Cite" in modern Paris—the original nucleus round which gradually clustered the dwellings of *later generations*.

Before, however, we enter upon what may be styled King Street proper, it will be convenient to make a momentary digression northwards into Duke Street, anciently a quiet, retired thoroughfare, skirted on the right and left by the premises and grounds and houses of several most respectable inhabitants. At the north-west angle of the intersection of this street with George Street was the home of Mr. Washburn, but this was comparatively a recent erection.

Its site previously had been the brickyard of Henry Hale, a builder and contractor, who put up the residence, possessing some architectural pretensions, on the south-east angle of the same intersection, diagonally across; occupied in the second instance by Mr. Moore, of the Commissariat; then by Dr. Lee, and afterwards by Mr. J. Murchison. (The last named was for a long time the Stultz of York, supplying all those of its citizens, young and old, who desired to make an attractive or intensely respectable appearance, with vestments in fine broadcloth.) A little to the north, on the left side of George Street, was the famous Ladies' School of Mrs. Goodman, presided over subsequently by Miss Purcell and Miss Rose. This had been previously the homestead of Mr. Stephen Jarvis, of whom again immediately. Advancing on Duke Street eastward a little way, we came, on the left, to the abode of Sir William Campbell. (The still extant *brick* mansion it of the late date of 1822.) Then on the right, one square beyond, at the south-easterly corner where Caroline Street intersects, we reached the house of Mr. Secretary Jarvis, a man of great note in his day, whose name is familiar to all who have occasion to examine the archives of Upper Canada in the administrations of Governors Simcoe, Hunter and Gore. A fine portrait of him exists, but it has been transmitted to relatives in England. Mr. Stephen Jarvis, above named, was long the Registrar of Upper Canada. His hand-writing is well-known to all holders of early deeds. He and the Secretary were first cousins; of the same stock as the well-known Bishop Jarvis of Connecticut, and the Church-historian, Dr. Samuel Farmer Jarvis. Both were officers in incorporated Colonial regiments before the independence of the United States; and both came to Canada as United Empire Loyalists. Mr. Stephen Jarvis was the founder of the leading Canadian family to which the first Sheriff Jarvis belonged. Mr. Samuel Peters Jarvis, from whom "Jarvis Street" has its name, was the son of Mr. Secretary Jarvis. On the left, one square beyond the abode of Mr. Secretary Jarvis, came the premises and home of Mr Surveyor General Ridout, the latter a structure still to be seen in its primitive outlines, a good specimen of the old type of early Upper Canadian family residences of a superior class; combining the qualities of solidity and durability with those of snugness and comfort in the rigours of winter and the heats of summer. In the rear of Mr. Ridout's house was for some time a family burial-plot; but, like several similar private enclosures in the neighborhood of the town, it became disused after the establishment of regular cemeteries.

Nearly opposite Mr. Ridout's, in one of the usual long, low Upper Canadian one-storey dwellings, shaded by lofty Lombardy poplars, was the home of the McIntoshes, who are to be commemorated hereafter in connection with the Marine of York; and here, at a later period, lived for a long time Mr. Andrew Warffe and his brother John. Mr. Andrew Warffe was a well-known employé in the office of the Inspector General, Mr. Baby, and a lieutenant in the Incorporated Militia.

By one of the vicissitudes common in the history of family-residences everywhere, Mr. Secretary Jarvis's house, which we just now passed, became afterwards the place of business of a memorable cutler and gunsmith, named Isaac Columbus. During the war of 1812, Mr. Columbus was employed as armourer to the Militia, and had a forge near the garrison. Many of the swords used by the Militia officers were actually manufactured by him. He was a native of France; a liberal-hearted man, ever ready to contribute to charitable objects, and a clever artizan Whether required to "jump" the worn and battered axe of a backwoodsman, to put in order a surveyor's theodolite, or to replace for the young geometrician or draughtsman an instrument lost out of his case, he was equally *au-fait*. On occasion he could even supply an elderly lady or gentleman with a set of false teeth, and insert them. In our boyhood we had occasion to get many little matters attended to at Mr. Columbus's. Once, on leaving word that a certain article must be ready by a particular hour, we remember being informed that "must" was only for the King of France. His political absolutism would have satisfied Louis XIV. himself He positively refused to have anything to do with the "liberals" of York, expressly on the ground that, in his opinion, the modern ideas of government "hindered the King from acting as a good father to the people." An expressson of his, "first quality, blue!" used on a particular occasion in reference to an extra finish to be given to some steel-work for an extra price, passed into a proverb among us boys at school, and was extensively applied by us to persons and things of which we desired to predicate a high degree of excellence.—Over Columbus's workshop, at the corner of Caroline Street, we are pretty sure his name appeared as here

given; and so it was always called. But we observe in some lists of early names in York, that it is given as "Isaac Collumbes." It is curious to note that the great discoverer's name is a latinization of Colon, Coulon, Colombe, descendant each of *columba*, dove, of which *columbus* is the masculine form.

XVI.—KING STREET, FROM GEORGE STREET TO CAROLINE STREET.

We now retrace our steps to King Street, at its intersection with George Street; and here our eye immediately lights on an object connected with the early history of Education in York. Attached to the east side of the house at the south-east angle of the intersection is a low building, wholly of stone, resembling a small root-house. Its structure is concealed from view now by a coating of clapboards. This was the first school-house possessing a public character in York. It was where Dr. Stuart taught, afterwards Archdeacon of Kingston. The building was on his property, which became afterwards that of Mr. George Duggan, once before referred to. (In connection with St. James's Church, it should have been recorded that Mr. Duggan was the donor and planter of the row of Lombardy poplars that formerly stood in front of that edifice, and which figure conspicuously in the old engravings of King Street. He was an Irishman of strong opinions. He once stood for the town against Mr. Attorney-General Robinson, but did not get in. When the exigencies of later times required the uprooting of the poplar trees, now become overgrown, he warmly resented the removal; and it was at the risk of grievous bodily harm that the Church-warden of the day, Mr. T. D. Harris, carried into effect the resolution of the Vestry.) Dr. Stuart's was the Home District School. From a contemporary record, now before us, we learn that it opened on June the first, 1807, and that the first names entered on its books were those of John Ridout, William A. Hamilton, Thomas G. Hamilton, George H. Detlor, George S. Boulton, Robert Stanton, William Stanton, Angus McDonnell, Alexander Hamilton, Wilson Hamilton, Robert Ross, Allan McNab. To this list, from time to time, were added many other old Toronto or Upper Canadian names; as, for example, the following: John Moore, Charles Ruggles, Edward Hartney, Charles Boulton, Alexander Chewett, Donald McDonnell, James Edward Small, Charles Small, John Hayes, George and William Jarvis, William Boulcett, Peter McDonnell, Philemon Squires, James McIntosh, Bernard, Henry and Marshall Glennon, Richard Brooke, Daniel Brooke, Charles Reade, William Robinson, Gilbert Hamilton, Henry Ernst, John Gray, Robert Gray, William Cawthra, William Smith, Harvey Woodruff, Robert Anderson, Benjamin Anderson, James Givins, Thomas Playter, William Pilkington. The French names Belcour, Hammel and Marian occur. (There were bakers or confectioners of these names in York at an early period.) From the same record it appears that female pupils were not excluded from the primitive Home District School On the roll are names which surviving contemporaries would recognize as belonging to the beau monde of Upper Canada, distinguished and admired in later years.

A building-lot, eighty-six feet in front and one hundred and seventeen in depth, next to the site of the school, is offered for sale in the *Gazette* of the 18th of March, 1822; and in the advertisement it is stated to be "one of the most eligible lots in the Town of York, and situated in King Street, in the centre of the Town." To the left, just across from this choice position, was, in 1823, Wragg & Co.'s establishment, where such matter-of-fact articles as the following could be procured: "Bending and unbending nails, as usual; wrought nails and spikes of all sizes [a change since 1810]; ox-traces and cable-chains; tin; double and single sheet iron; sheet brass and copper; bar, hoop, bolt and rod iron of all sizes; shear, blister and cast steel; with every other article in the heavy line, together with a very complete assortment of shelf goods, cordage, oakum, pitch, tar and rosin: also a few patent machines for shelling corn." (A much earlier resort for such merchandize was Mr. Peter Paterson's, on the west side of the Market Square.) Of a date somewhat subsequent to that of Messrs. Wragg's advertisement, was the depôt of Mr. Harris for similar substantial wares. This was situated on the north side of King Street, westward of the point at which we are now pausing. It long resisted the great conflagration of 1849, towering up amidst the flames like a black, isolated crag in a tempestuous sea; but at length it succumbed. Having been rendered, as it was supposed, fire-proof externally, no attempt was made to remove the contents of the building.—To the east of Messrs. Wragg's place of business, on the same side, and dating back to an early period, was the dwelling house and mart of Mr. Mosley, the principal auctioneer and

appraiser of York, a well-known and excellent man He had suffered the severe calamity of a partial deprivation of the lower limbs by frost-bite; but he contrived to move about with great activity in a room or on the side-walk by means of two light chairs, shifting himself adroitly from the one to the other. When required to go to a distance or to church, (where he was ever punctually to be seen in his place), he was lifted by his son or sons into and out of a wagonette, together with the chairs.

On the same (north) side was the place where the Messrs Lesslie, enterprising and successful merchants from Dundee, dealt at once in two remunerative articles—books and drugs. The left side of the store was devoted to the latter; the right to the former. Their first head-quarters in York had been further up the street; but a move had been made to the eastward, to be, as things were then, nearer the *heart* of the town. This firm had houses carrying on the same combined businesses in Kingston and Dundas. There exists a bronze medal or token, of good design, sought after by collectors, bearing the legend, "E. Lesslie and Sons, Toronto and Dundas, 1822." The date has been perplexing, as the town was not named Toronto in 1822. The intention simply was to indicate the year of the founding of the firm in the two towns; the first of which assumed the name of Toronto at the period the medal was really struck, viz., 1834. On the obverse it bears a figure of Justice with scales and sword: on the reverse, a Plough, with the mottoes, "Prosperity to Canada," "La Prudence et la Candeur."—A smaller Token of the same firm is extant, on which "Kingston" is inserted between "Toronto" and "Dundas."

Nearly opposite was the store of Mr. Monro. Regarding our King Street as the Broadway of York, Mr. Monro was for a long time its Stewart. But the points about his premises that linger now in our recollection the most, are a tasteful flower-garden on its west side, and a trellised verandah in that direction, with canaries in a cage usually singing therein. Mr. Monro was Mayor of Toronto in 1840. He also represented in Parliament the South Riding of York, in the Session of 1844-5.

At the north-west corner, a little further on, resided Mr. Alexander Wood, whose name appears often in the Report of the Loyal and Patriotic Society of 1812, to which reference before has been made, and of which he was the Secretary. A brother of his, at first in copartnership with Mr. Allan, and at a later period, independently, had made money, at York, by business. On the decease of his brother, Mr. Alexander Wood came out to attend to the property left He continued on the same spot, until after the war of 1812, the commercial operations which had been so prosperously begun, and then retired. At the time to which our recollections are transporting us, the windows of the part of the house that had been the store were always seen with the shutters closed. Mr. Wood was a bachelor; and it was no uncosy sight, towards the close of the shortening autumnal days, before the remaining front shutters of the house were drawn in for the evening, to catch a glimpse, in passing, of the interior of his comfortable quarters, lighted up by the blazing logs on the hearth, the table standing duly spread close by, and the solitary himself ruminating in his chair before the fire, waiting for candles and dinner to be brought in. On sunny mornings in winter he was often to be seen pacing the sidewalk in front of his premises, for exercise, arrayed in a long blue over-coat, with his right hand thrust for warmth into the cuff of his left sleeve, and his left hand into that of his right. He afterwards returned to Scotland, where, at Stonehaven, not far from Aberdeen, he had family estates known as Woodcot and Woodburnden. He died without executing a will; and it was some time before the rightful heir to his property in Scotland and here was determined. It had been his intention, we believe, to return to Canada. The streets that run eastward from Yonge Street, north of Carlton Street, named respectively "Wood" and "Alexander," pass across land that belonged to Mr. Wood.

Many are the shadowy forms that rise before us, as we proceed on our way; phantom-revisitings from the misty Past; the shapes and faces of enterprising and painstaking men, of whose fortunes King Street hereabout was the cradle. But it is not necessary in these reminiscences to enumerate all who, on the right hand and on the left, along the now comparatively deserted portions of that great thoroughfare, amassed wealth in the olden time by commerce and other honourable pursuits, laying the foundation, in several instances, of opulent families.

Quetton St. George, however, must not be omitted, builder of the solid and enduring house on the corner opposite to Mr. Wood's; a structure that, for its size and air of respectability;

for its material, brick, when as yet all the surrounding habitations were of wood; for its tinned roof, its graceful porch, its careful and neat finish generally, was, for a long time, one of the York lions.—Mr. Quetton St. George was a French royalist officer, and a chevalier of the order of St. Louis. With many other French gentlemen he emigrated to Canada at the era of the Revolution He was of the class of the noblesse, as all officers were required to be; which class, just before the Revolution, included, it is said, 90,000 persons, all exempt from the ordinary taxes of the country. The surname of St. George was assumed by M. Quetton to commemorate the fact that he first set foot on English ground on St. George's day On proceeding to Canada, he, in conjunction with Jean Louis, Vicomte de Chalus, and other distinguished *emigres*, acquired a large estate in wild lands in the rough region north of York, known as the "Oak Ridges" Finding it difficult, however, to turn such property speedily to account, he had recourse to trade with the Indians and remote inhabitants. Numerous stations with this object in view, were established by him in different parts of the country, before his final settlement *in York. One of these posts was at Orillia*, on Lake Couchiching; and in the Niagara *Herald* of August the 7th, 1802, we meet with the following advertisement: "New Store at the House of the French General, between Niagara and Queenston. Messrs. Quetton St. George and Co acquaint the Public that they have lately arrived from New York with a general assortment of Dry Goods and Groceries, which will be sold at the lowest price for ready money; for from the uncertainty of their residing any time in these parts, they cannot open accounts with any person. Will also be found at the same store a general assortment of tools for all mechanics. They have likewise well-made Trunks: also empty Barrels. Niagara, July 23." The copartnership implied was with M. de Farcy. The French General referred to was the Comte de Puisaye. The house spoken of still exists, beautifully situated at a point on the Niagara River where the carriage-road between Queenston and the town of Niagara approaches the very brink of the lofty bank, whose precipitous side is even yet richly clothed with fine forest trees, and where the noble stream below, closed in towards the south by the heights above Lewiston and Queenston, possesses all the features of a picturesque inland lake. Attached to the house in question is a curious old fire-proof structure of brick, quaintly buttressed with stone: the walls are of a thickness of three or four feet; and the interior is beautifully vaulted and divided into two compartments having no communication with each other: and above the whole is a long loft of wood, approached by steps on the outside. The property here belonged for a time in later years to Shickluna, the shipbuilder of St. Catharines, who happily did not disturb the interesting relic just described. The house itself was in some respects modernized by him; but, with its steep roof and three dormer windows, it still retains much of its primitive character.—In 1805 we find Mr. St. George removed to York. The copartnership with M. de Farcy is now dissolved. In successive numbers of the *Gazette and Oracle*, issued in that and the following year, he advertises at great length. But on the 20th of September, 1806, he abruptly announces that he is not going to advertise any more: he now once for all, begs the public to examine his former advertisements, where they will find, he says, an account of the supply which he brings from New York every spring, a similar assortment to which he intends always to have on hand: and N. B., he adds: Nearly the same assortment may be found at Mr. Boiton's at Kingston, and at Mr. Boucherville's at Amherstburg, "who transact business for Mr. St. George." As we have, in the advertisements referred to, a rather minute record of articles and things procurable and held likely to be wanted by the founders of society in these parts, we will give, for the reader's entertainment, a selection from several of them, adhering for the most part to the order in which the goods are therein named. From time to time it is announced that there have "just arrived from New York," ribbons, cotton goods, silk tassels, gown-trimmings, cotton binding, wire trimmings, silk belting, fans, beaded buttons, block tin, glove ties, cotton bed-line, bed-lace, rollo-bands, ostrich feathers, silk lace, black veil lace, thread do., laces and edgings, fine black veils, white do., fine silk mitts, love-handkerchiefs, Barcelona do., silk do., black crape, black mode, black Belong, blue, white and yellow do., striped silk for gowns, Chambray muslins, printed dimity, split-straw bonnets, Leghorn do., imperial chip do., best London Ladies' beaver bonnets, cotton wire, Rutlandgauze, band boxes, cambrics, calicoes, Irish linens, callimancoes, plain muslins, laced muslins, blue, black and yellow nankeens, jeans, fustians, long silk gloves, velvet ribbons, Russia sheetings, India satins, silk and cotton umbrellas, parasols, white cottons,

bombazetts, black and white silk stockings, damask table cloths, napkins, cotton, striped nankeens, bandana handkerchiefs, catgut, Tickenburg, brown holland, Creas à la Morlaix, Italian lutestring, beaver caps for children. Then we have Hyson tea, Hyson Chaulon in small chests, young Hyson, green, Souchong and Bohea, loaf, East India and Muscovado sugars, mustard, essence of mustard, pills of mustard, capers, lemon-juice, soap, Windsor do., indigo, mace, nutmegs, cinnamon, cassia, cloves, pimento, pepper, best box raisins, prunes, coffee, Spanish and American "segars," Cayenne pepper in bottles, pearl barley, castor-oil, British oil, pickled oysters. Furthermore, china-ware is to be had in small boxes and in sets; also, Suwarrow boots, bootees, and an assortment of men's, women's and children's shoes, japanned quart mugs, do. tumblers, tipped flutes, violin bows, brass wire, sickles, iron candlesticks, shoemakers' hammers, knives, pincers, pegging awls and tacks, awl-blades, shoe-brushes, copper tea-kettles, snaffle-bits, leather shot belts, horn powder flasks, ivory, horn and crooked combs, mathematical instruments, knives and forks, suspenders, fish-hooks, sleeve-links, sportsmen's knives, lockets, earrings, gold, topaz do., gold watchchains, gold seals, gold brooches, cut gold rings, plain do., pearl do., silver thimbles, do teaspoons, shell sleeve buttons, silver watches, beads. In stationery there was to be had pasteboard, foolscap paper, second do, letter paper, black and red ink powder and wafers. There was also the following supply of Literature: Telemachus, Volney's Views, Public Characters, Dr. Whitman's Egypt, Evelina, Cecilia, Lady's Library, Ready Reckoner, Looking Glass, Franklin's Fair Sex, Camilla, Don Raphael, Night Thoughts, Winter Evenings, Voltaire's Life, Joseph Andrews, Walker's Geography, Bonaparte and the French People, Voltaire's Tales, Fisher's Companion, Modern Literature, Eccentric Biography, Naval do., Martial do., Fun, Criminal Records, Entick's Dictionary, Gordon's America, Thompson's Family Physician, Sheridan's Dictionary, Johnson's do., Wilson's Egypt, Denon's Travels, Travels of Cyrus, Stephani de Bourbon, Alexis, Pocket Library, Every Man's Physician, Citizen of the World, Taplin's Farriery, Farmer's Boy, Romance of the Forest, Grandison, Campbell's Narrative, Paul and Virginia, Adelaide de Sincere, Emelini, Monk, Abbess, Evening Amusement, Children of the Abbey, Tom Jones, Vicar of Wakefield, Sterne's Journey, Abelard and Eloisa, Ormond, Caroline, Mercutio, Julia and Baron, Minstrel, H. Villars, De Valcourt, J. Smith, Charlotte Temple, Theodore Chypon, What has Been, Elegant Extracts in Prose and Verse. J. and J. Jessamy, Chinese Tales, New Gazzetteer, Smollet's Works, Cabinet of Knowledge, Devil on Sticks, Arabian Tales, Goldsmith's Essays, Bragg's Cookery, Tooke's Pantheon, Boyle's Voyage, Roderick Random, Jonathan Wild, Louisa, Solomon's Guide to Health, Spelling-books, Bibles and Primers —Our extracts have extended to a great length: but the animated picture of Upper Canadian life at a primitive era, which such an enumeration of items, in some sort affords, must be our apology. Rendered rich in money and lands by his extemporized mercantile operations, Mr. St. George returned to his native France soon after the restoration of Louis XVIII., and passed the rest of his days partly in Paris and partly on estates in the neighborhood of Montpelier. During his stay in Canada he formed a close friendship with the Baldwins of York; and on his departure, the house on King Street, which has given rise to these reminiscences of him, together with the valuable commercial interests connected with it, passed into the hands of a junior member of that family, Mr. John Spread Baldwin, who himself, on the same spot, subsequently laid the foundation of an ample fortune.—(It is a phenomenon not uninteresting to the retrospective mind, to observe, in 1869, after the lapse of half a century, the name of Quetton St. George reappearing in the field of Canadian Commerce.)

Advancing now on our way eastward, we soon came in front of the abode of Dr. Burnside, a New England medical man of tall figure, upright carriage, and bluff, benevolent countenance, an early promoter of the Mechanics' Institute-movement, and an encourager of church-music, vocal and instrumental. Dying without a family dependent on him, he bequeathed his property partly to Charities in the town, and partly to the University of Trinity College, where a scholarship perpetuates his memory.

Just opposite was the residence of the venerable Mrs. Gamble, widow of Dr. Gamble, formerly a surgeon attached to the Queen's Rangers. This lady died in 1859, in her 92nd year, leaving living descendants to the number of two hundred and four. To the west of this house was a well-remembered little parterre, always at the proper season gay with flowers.

At the next corner, on the north side, a house now totally demolished, was the original home of the millionaire Cawthra family, already once alluded to. In the "Gazette and Oracle" for Nov. 29, 1806, the name "J. Cawthra" is for the first time seen, appended to an advertisement, in which he informs the inhabitants of York and the neighboring country that he had just arrived from New York with a general assortment of "apothecary articles;" and that the public can be supplied with everything in that line genuine: also patent medicines: he likewise intimates that he has brought a general assortment of Dry Goods, consisting of "broad cloths, duffils, flannels, swansdown, corduroys, printed calicoes, ginghams, cambric muslins, shirting, muslins, men and women's stockings, silk handkerchiefs, bandana shawls, pulicat and pockethandkerchiefs, calimancoes, dimity and check; also a large assortment of men's, women's and children's shoes, hardware, coffee, tea and chocolate, lump and loaf sugar, tobacco, &c., with many other articles: which he is determined to sell on very low terms at his store opposite Stoyell's tavern. York, Nov. 27, 1806."

Immediately across, at the corner on the south side, was a depôt, insignificant enough, no doubt, to the indifferent passer-by, but invested with much importance in the eyes of many of the early infantiles of York. Its windows exhibited, in addition to a scattering of white clay pipes, and papers of pins suspended open against the panes for the public inspection, a display of circular discs of gingerbread, some with plain, some with scolloped edge; also hearts, fishes, little prancing ponies, parrots and dogs of the same tawny-hued material; also endwise in tumblers and other glass vessels, numerous lengths or stems of prepared saccharine matter, brittle in substance, white-looking, but streaked and slightly penetrated with some rich crimson pigment; likewise on plates and oval dishes, a collection of quadrangular viscous lumps, buff-coloured and clammy, each showing at its ends the bold gashing cut of a stout knife which must have been used in dividing a rope, as it were, of the tenacious substance into inch-sections or parts. In the wrapping paper about all articles purchased here, there was always a *soupcon* of the homely odors of boiled sugar and peppermint. The tariff of the various comestibles just enumerated was well known; it was precisely for each severally, one half-penny. The mistress of this establishment bore the Scottish name of Lumsden—a name familiar to us lads in another way also, being constantly seen by us on the title-pages of school-books, many of which, at the time referred to, were imported from Glasgow, from the publishing-house of Lumsden and Son.

A little way down the street which crosses here, was Major Heward's house, long Clerk of the Peace for the Home District, of whom we have had occasion to speak before. Several of his sons, while pursuing their legal and other studies, became also "mighty hunters;" distinguished, we mean, as enthusiastic sportsmen. Many were the exploits reported of them, in this line. We give here an extract from Mr. McGrath's lively work, published in 1833, entitled "Authentic letters from Upper Canada, with an Account of Canadian Field Sports." "Ireland," he says, "is, in many places, remarkable for excellent cock-shooting, which I have myself experienced in the most favorable situations: not, however, to be compared with this country, where the numbers are truly wonderful. Were I to mention," Mr. McGrath continues, "what I have seen in this respect, or heard from others, it might bring my graver statements into disrepute.—As a specimen of the sport," he says, "I will merely give a fact or two of, not unusual, success; bearing, however, no proportion to the quantity of game. I have known Mr. Charles Heward, of York," he proceeds to state, "to have shot in one day thirty brace at Chippewa, close to the Falls of Niagara—and I myself," Mr. McGrath continues, "who am far from being a first-rate shot, have frequently brought home from twelve to fourteen brace, my brothers performing their part with equal success."—But the younger Messrs. Heward had a field for the exercise of their sportsman skill nearer home than Chippewa. The Island, just across the Bay, where the black-heart plover were said always to arrive on a particular day, the 23rd of May, every year, and the marshes about Ashbridge's bay, and York harbour itself, all abounded with wild fowl.

XVII.—KING STREET, FROM CAROLINE STREET TO BERKELEY STREET.

Returning again to King Street: At the corner of Caroline Street, diagonally across from the Cawthra homestead, was the abode, when ashore, of Capt. Oates, commander of the *Duke of Richmond* sloop, the fashionable packet plying between Niagara and York. He was nearly connected with the family of President Russell, but curiously obtained no share in the broad acres which were, in the early day, so plentifully distributed to all comers. By being unluckily out of the way, too, at a critical moment subsequently, he missed a bequest at the hands of the sole inheritor of the possessions of his relative. Capt. Oates was a man of dignified bearing, of more than the ordinary height. He had seen service on the ocean as master and owner of a merchantman His portrait, which is still preserved in Toronto, somewhat resembles that of George IV —A spot passed, a few moments since, on King Street, is associated with a story in which the *Richmond* sloop comes up. It happened that the nuptials of a neighbouring merchant had lately taken place. Some youths, employed in an adjoining warehouse or law-office, took it into their heads that a *feu de joie* should be fired on the occasion To carry out the idea they proceed, under cover of the night, to the *Richmond* sloop, where she lay frozen in by the Frederic Street wharf, and remove from her deck, without asking leave, a small piece of ordnance with which she was provided. They convey it with some difficulty, carriage and all, up into King Street, and place it in front of the bridegroom's house; run it back, as we have understood, even into the recess underneath the double steps of the porch: when duly ensconced there, as within the port of a man-of-war, they contrive to fire it off, decamping, however, immediately after the exploit, and leaving behind them the source of the deafening explosion. On the morrow the cannon is missed from the sloop, (she was being prepared for the spring navigation): on instituting an inquiry, Capt Oates is mysteriously informed the lost article is, by some means, up somewhere on the premises of Mr. ———, naming the gentleman who had been honoured with the salute, and that if he desired to recover his property he must despatch some men thither to fetch it.—We shall have occasion to refer again to the *Richmond*, when we come to speak of the early Marine of York Harbour.

Passing on our way eastward we came immediately, on the north side, to one of the principal hotels of York, a long, white, two-storey wooden building It was called the Mansion House—an appropriate name for an inn, when we understand "Mansion" in its proper, but somewhat forgotten sense, as indicating a temporary abode, a place which a man occupies and then relinquishes to a successor. The landlord here for a considerable time was Mr. DeForest.

We then arrived at the north-west angle of King and Princes streets, where a second public well (we have already commemorated the first,) was sunk, and provided with a pump in 1824—for all which the sum of £36 17s. 6d. was paid to John James on the 19th of August in that year. In the advertisements and contracts connected with this now obliterated public convenience, Princes Street is correctly printed and written as it here meets the eye, and not "Princess Street," as the recent corruption is. Let not the record of our early water-works be disdained. Those of the metropolis of the Empire were once on a humble scale. Thus Master John Stow, in his *Survey of London, Anno 1598*, recordeth that "at the meeting of the corners of the Old Jurie, Milke Street, Lad Lane and Aldermanburie, there was of old time a fair well with two buckets; of late years," he somewhat pathetically adds, "converted to a pump."

Just across eastward from the pump was one of the first buildings put up on King Street: it was erected by Mr. Smith, who was the first to take up a building lot, after the laying out of the town-plot. On the opposite side, a few steps further on, was Jordan's—the far-famed "York Hotel"—the hotel *par excellence* of the place, than which no better could be found at the time in all Upper Canada The whole edifice has now utterly disappeared. Its foundations giving way, it for a while seemed to be sinking into the earth, and then it partially threatened to topple over into the street. It was of antique style when compared with the Mansion House. It was only a storey-and-a-half high. Along its roof was a row of dormer windows. Specimens of this style of hotel may still be seen in the country-towns of Lower Canada. When looking in later times at the doorways and windows of the older buildings intended for public and domestic purposes, as also the dimensions of rooms and the proximity of the ceilings to the floors, we might be led for a moment to imagine that the generation of settlers passed away must have been of smaller bulk and stature than their descendants. But points especially

studied in the construction of early Canadian houses, in both Provinces, were warmth and comfort in the long winters. Sanitary principles were not much thought of, and happily did not require to be much thought of, when most persons passed more of their time in the pure outer air than they do now. Jordan's York Hotel answered every purpose very well. Members of Parliament and other visitors considered themselves in luxurious quarters when housed there. Probably in no instance have the public dinners or fashionable assemblies of a later era gone off with more *eclat*, or given more satisfaction to the persons concerned in them, than did those which from time to time, in every season, took place in what would now be considered the very diminutive ball-room and dining-hall of Jordan's.

As the sidewalks of King Street were apt to partake, in bad weather, of the impassableness of the streets generally at such a time, an early effort was made to have some of them paved. Some yards of foot-path, accordingly, about Jordan's, and here and there elsewhere, were covered with flat flagstones from the lake-beach, of very irregular shapes and of no great size: the effect produced was that of a very coarse, and soon a very uneven mosaic. At Quebec, in the neighbourhood of the Court House, there is retained some pavement of the kind now described; and in the early lithograph of Court House Square, at York, a long stretch of sidewalk is given in the foreground, seamed-over curiously, like the surface of an old Cyclopean or Pelasgic wall. On April the 26th, 1823, it was ordered by the magistrates at Quarter Sessions that "£100 from the Town and Police Fund, together with one-fourth of the Statute Labour within the Town, be appropriated to flagging the sidewalks of King Street, commencing from the corner of Church Street and proceeding east to the limits of the Town, and that both sides of the streets do proceed at the same time" One hundred pounds would not go very far in such an undertaking. We do not think the sidewalks of the primitive King Street were ever paved throughout their whole length with stone.

After Jordan's came Dr. Widmer's surgery, associated with many a pain and ache in the minds of the early people of York, and scene of the performance upon their persons of many a delicate, and daring, and successful remedial experiment. Nearly opposite was the property of Dr. Stoyell, an immigrant, non-practicing medical man from the United States, with Republican proclivities as it used to be thought, who, previous to his purchasing here, conducted an inn at Mrs. Lumsden's corner. (The house on the other side of Ontario Street, westward, was Hayes' Boarding House, noticeable simply as being in session-time, like Jordan's, the temporary abode of many Members of Parliament).

After Dr. Widmer's, towards the termination of King Street, on the south side, was Mr. Small's, originally one of the usual low-looking domiciles of the country, with central portion and two gabled wings, somewhat after the fashion of many old country manor-houses in England. The material of Mr. Small's dwelling was hewn timber. It was one of the earliest domestic erections in York. When re-constructed at a subsequent period, Mr. Charles Small preserved, in the enlarged and elevated building, now known as Berkeley House, the shape and even a portion of the inner substance of the original structure. We have before us a curious plan (undated but old) of the piece of ground originally occupied and enclosed by Mr. Small, as a yard and garden round his primitive homestead; occupied and enclosed, as it would seem, before any building lots were set off by authority on the Government reserve or common here. The plan referred to is entitled "A sketch shewing the land occupied by John Small, Esq, upon the Reserve appropriated for the Government House at York by His Excellency, Lt. Gov. Simcoe." An irregular oblong, coloured red, is bounded on the north side by King Street, and is lettered within—"Mr. Small's Improvements." Round the irregular piece thus shewn, lines are drawn enclosing additional space, and bringing the whole into the shape of a parallelogram: the parts outside the irregularly-shaped red portion, are coloured yellow: and on the yellow, the memorandum appears—"This added would make an Acre." The block thus brought into shapely form is about one-half of the piece of ground that at present appertains to Berkeley House.—The plan before us also incidentally shows where the Town was supposed to terminate:—an inscription—"Front line of the Town"—runs along the following route: up what is now the lane through Dr. Widmer's property; and then, at a right angle eastward along what is now the north boundary of King Street opposite the block which it was necessary to get into shape round Mr. Small's first "Improvement." King Street proper, in this plan, terminates at "Ontario Street:" from the eastern limit of Ontario Street, the continuation of

the highway is marked "Road to Quebec,"—with an arrow shewing the direction in which the traveller must keep his horse's head, if he would reach that ancient city. The arrow, at the end of the inscription just given, points slightly upwards, indicating the fact that the said "Road to Quebec" trends slightly to the north after leaving Mr. Small's clearing.

XVIII.—FROM BERKELEY STREET TO POWER AND TRINITY STREETS.

We now propose to pass rapidly down "the road to Quebec" as far as the Bridge. First we cross, in the hollow, Goodwin's creek, the stream that enters the Bay by the ent-stone Gaol. On the knoll to the right was Pilkington's cottage, a little group of low white buildings in a grove of pines and acacias. Parliament Street, which enters near here from the north, is a memorial of the olden time, when, as we have seen, the Parliament Buildings of Upper Canada were situated in this neighbourhood. In an early section of these Recollections we observed that what is now called Berkeley Street was originally Parliament Street, a name which, like that borne by a well-known thoroughfare in Westminster, for a similar reason, indicated the fact that it led down to the Houses of Parliament. The road that at present bears the name of Parliament Street shews the direction of the track through the primitive woods opened by Governor Simcoe to his summer house on the Don, called Castle-Frank, of which fully, in its place, hereafter. Looking up Parliament Street we are reminded that a few yards from where Duke Street enters, lived at an early period Mr. Richard Coates, an estimable and ingenious man, whose name is associated in our memory with the early dawn of the fine arts in York. Mr. Coates, in a self-taught way, executed, not unsuccessfully, portraits in oil of some of our ancient worthies. Among things of a general or historical character, he painted also for David Wilson, the founder of the "Children of Peace," the symbolical decorations of the interior of the Temple at Sharon. He cultivated music likewise, vocal and instrumental; he built an organ of some pretensions, in his own house, on which he performed; he built another for David Wilson at Sharon. Mr. Coates constructed, besides, in the yard of his house, an elegantly-finished little pleasure yacht of about nine tons burden.

Thus passing reference to infant Art in York recalls again the name of Mr. John Craig, who has before been mentioned in our account of the interior of one of the many successive St. Jameses. Although Mr. Craig did not himself profess to go beyond his sphere as a decorative and heraldic painter, the spirit that animated him really tended to foster in the community a taste for art in a wider sense. Mr. Charles Daly, also, as a skillful teacher of drawing in water-colours and introducer of superior specimens, did much to encourage art at an early date. In 1834 we find Mr. Daly promoting an exhibition of Paintings by the "York Artists and Amateur Association," and acting as "Honorary Secretary," when the Exhibition for the year took place. Mr. James Hamilton, a teller in the bank, produced, too, some noticeable landscapes in oil. As an auxiliary in the cause, and a ministrant to the wants of artists at an early period, we name, likewise, Mr. Alexander Hamilton; who, in addition to supplying materials in the form of pigments and prepared colours, contributed to the tasteful setting off of the productions of pencil and brush, by furnishing them with frames artistically carved and gilt.—Out of the small beginnings and rudiments of Art at York, one artist of a genuine stamp was, in the lapse of a few years, developed—Mr. Paul Kane; who, after studying in the schools of Europe, returned to Canada and made the illustration of Indian character and life his specialty. By talent exhibited in this class of pictorial delineation, he acquired a distinguished reputation throughout the North American continent; and by his volume of beautifully illustrated travels, published in London, and entitled "Wanderings of an Artist among the Indians of North America," he obtained for himself a recognized place in the literature of British Art.

In the hollow, a short distance to the west of Mr. Coates's, was one of the first buildings of any size ever erected here wholly of stone. It was put up by Mr. Hutchinson. It was a large square family house of three storeys. It still exists, but its material is hidden under a coating of stucco. Another building, wholly of stone, was Mr. Hunter's house, on the west side of Church Street. A portion of Hugill's Brewery likewise exhibited the same solid, English-looking kind of structure. We now resume our route.

XIX.—FROM POWER AND TRINITY STREETS TO DON STREET.

We immediately approach another road entering from the north, which again draws us aside. This opening led up to the only Roman Catholic church in York, an edifice of red brick, substantially built. Mr. Ewart was the architect. The material of the north and south walls was worked into a kind of tasselated pattern, which was considered something very extraordinary. The spire was originally surmounted by a large and spirited effigy of the bird that admonished St. Peter, and not by a cross. It was not a flat, moveable weathercock, but a fixed, solid figure, covered with tin. In this building officiated for some time an ecclesiastic named O'Grady. Mingling with a crowd, in the over curious spirit of boyhood, we here, at funerals and on other occasions, first witnessed the ceremonial forms observed by Roman Catholics in their worship; and once we remember being startled at receiving, by design or accident, from an overcharged *aspergillum in the hands of a zealous ministrant* of some grade passing down the aisle, a copious splash of holy water in the eye. Functionaries of this denomination are generally remarkable for their quiet discharge of duty and for their apparent submissiveness to authority. They sometimes pass and repass for years before the indifferent gaze of multitudes holding another creed, without exciting any curiosity even as to their personal names. But Mr O'Grady was an exception to the general run of his order. He acquired a distinctive reputation among outsiders. He was understood to be an unruly presbyter; and through his instrumentality, letters of his bishop, evidently never intended to meet the public eye, got into general circulation. He was required to give an account of himself, subsequently, at the feet of the "Supreme Pontiff." Power Street, the name now applied to the road which led up to the Roman Catholic church, preserves the name of the Bishop of this communion, who sacrificed his life in attending to the sick emigrants in 1847. The road to the south, a few steps further on, led to the wind-mill built by Mr. Worts, senior, in 1831. In the possession of Messrs. Gooderham & Worts are three interesting pictures, in oil, which from time to time have been exhibited. They are intended to illustrate the gradual progress in extent and importance of the mills and manufactures at the site of the wind-mill. The first shows the original structure—a circular tower of red brick, with the usual sweeps attached to a hemispherical revolving top; in the distance town and harbour are seen. The second shows the wind-mill dismantled, but surrounded by extensive buildings of brick and wood, sheltering now elaborate machinery driven by steam-power. The third represents a third stage in the march of enterprise and prosperity. In this picture gigantic structures of massive, dark-coloured stone tower up before the eye, vying in colossal proportions and ponderous strength with the works of the castle-builders of the feudal times.—We are told by an inhabitant well known, that when out duck-shooting, now nearly forty years since, he was surprised by falling in with Mr Worts, senior, rambling apparently without purpose in the bush at the Little Don: all the surrounding locality was then in a state of nature, and frequented only by the sportsman and trapper. On entering into conversation with Mr. Worts, our friend found that he was there prospecting for an object; that, in fact, somewhere near the spot where they were standing, he thought of putting up a wind-mill! The project at the time seemed sufficiently quixotic. But posterity beholds the large practical outcome of the idea then brooding in Mr. Worts's brain. In their day of small things the pioneers of new settlements may take courage from this instance of progress in one generation, from the rough to the most advanced condition. For a century to come, there will be bits of this continent as unpromising, at the first glance, as the mouth of the Little Don, forty years ago, yet as capable of being reclaimed by the energy and ingenuity of man, and being put to divinely-intended and legitimate uses.—Returning now from the wind-mill, once more to the "road to Quebec," in common language, the Kingston road, we passed, at the corner, the abode of one of the many early settlers in these parts that bore German names—the tenement of Peter Ernst, or Ernest as the appellation afterwards became. Just opposite on the left was where Angell lived, the architect of the abortive bridges over the mouths of the Don. We obtain from the York *Observer* of December 11, 1820, some earlier information in regard to Mr. Angell. It is in the form of a "Card" thus headed: "York Land Price Current Office, King Street." It then proceeds—"In consequence of the increase of the Population of the Town of York, and many applications for family accommodation upon the arrival of strangers desirous of becoming settlers, the Subscriber intends to add to the practice of his Office the business of a *House Surveyor* and *Architect*, to

lay out Building Estate, draw Ground plans, *Sections* and *Elevations* to *order*, and upon the most approved *European* and *English* customs. Also to make *estimates* and provide contracts with *proper securities* to prevent impostures, for the performance of the same E. ANGELL N. B.—Land proprietors having estate to dispose of, and persons requiring any branch of the above profession to be done, will meet with the most respectful attention on applicatton by letter, or at this office York, Oct 2." [1820]. The expression, "York Price Current Office," above used, is explained by the fact that Mr. Angell commenced at this early date the publication of a monthly "Land Price Current List of Estates on Sale in Upper Canada, to be circulated in England, Ireland, Scotland and Wales." Near Mr. Angell, on the same side, lived also Mr. Cummins, the manager of the *Upper Canada Gazette* printing office; and, at a later period, Mr. Watson, another well-known master-printer of York, who lost his life during the great fire of 1849, in endeavoring to save a favorite press from destruction, in the third storey of a building at the corner of King and Nelson streets, a position occupied subsequently by the Caxton-press of Mr. Hill.—On some of the fences along here, we remember seeing, in 1827-8, an inscription written up in chalk or white paint, memorable to ourselves personally, as being the occasion of our first taking serious notice of one of the political questions that were locally stirring the people of Upper Canada. The words inscribed were—NO ALIENS! Like the LIBERTY, EQUALITY, FRATERNITY, which we ourselves also subsequently saw painted on the walls of Paris; these words were intended at once to express and to rouse public feeling; only in the present instance, as we suppose now, the inscription emanated from the oligarchical rather than the popular side. The spirit of it probably was "Down with Aliens,"—and not "Away with the odious distinction of Aliens!" A dispute had arisen between the Upper and the Lower House as to the legal terms in which full civil rights should be conferred on a considerable ortion of the inhabitants of the country. After the acknowledgment of Independence in 1783, emigrants from the United States to the British Provinces came in no longer as British subjects, but as foreigners. Many such emigrants had acquired property and exercised the franchise without taking upon themselves, formally, the obligations of British subjects After the war of 1812, the law in regard to this matter began to be distinctly remembered. The desire then was to check an undue immigration from the southern side of the great lakes; but the effect of the revival of the law was to throw doubt on the land titles of many inhabitants of long standing; doubt on their claim to vote and to fill any civil office. The consent of the Crown was freely given to legislate on the subject: and in 1825-6 the Parliament resolved to settle the question But a dispute arose between the Lower and Upper House The Legislative Council sent down a *Bill* which was so amended in terms by the House of Assembly that the former body declared it then to be "at variance with the laws and established policy of Great Britain, as well as of the United States; and therefore, if passed into a law by this Legislature, would afford no relief to many of those persons who were born in the United States, and who have come into and settled in this Province." The Upper House party set down as disloyal all that expressed themselves satisfied with the Lower House amendments. It was from the Upper House party, we think, that the cry of "No Aliens!" had proceeded The Aliens measure had been precipitated by the cases of Barnabas Bidwell and of his son Marshall, of whom the former, after being elected, and taking his seat as member for Lennox and Addington, had been expelled the House, on the ground of his being an alien; and the latter had met with difficulties at the outset of his political career, from the same objection against him. In the case of the former, however, his alien character was not the only thing to his disadvantage —It was in connection with the expulsion of Barnabas Bidwell that Dr. Strachan gave to a member of the Lower House, when hesitating as to the legality of such a step, the remarkable piece of advice, "Turn him out, turn him out! Never mind the law!"—a dictum that passed into an adage locally, quoted usually in the Aberdeen dialect. Irritating political questions have now, for the most part, been disposed of in Canada. We have entered into the rest, in this respect, secured for us by our predecessors. The very fences which, some forty years ago, were muttering "No Aliens!" we saw, during the time of the last general election, exhibiting in conspicuous painted characters, the following exhortation: "To the Electors of the Dominion—Put in Powell's Pump"—a humorous advertisement, of course, of a particular contrivance for raising water from depths. We think it a sign of general peace and content, when the populace are expected to enjoy a little jest of this sort.—A small compact

house, with a pleasant little garden in front, on the left, a little way on, was occupied for a while by Mr. Joshua Beard, at the time Deputy Sheriff, but afterwards well known as owner of extensive ironworks in the town. We then came opposite to the abode, on the same side, of Charles Fothergill, some time King's Printer for Upper Canada. He was a man of wide views and great intelligence, fond of science, and an experienced naturalist. Several folio volumes of closely written manuscript, on the birds and animals generally of this continent, by him, must exist somewhere at this moment. They were transmitted to friends in England, as we have understood. We remember seeing in a work by Bewick a horned owl of this country, beautifully figured, which, as stated in the context, had been drawn from a stuffed specimen supplied by Mr. Fothergill. He himself was a skillful delineator of the living creatures that so much interested him. In 1832, Mr. Fothergill sat in Parliament as member for Northumberland, and for expressing some independent opinions in that capacity, he was deprived of the office of King's Printer. He originated the law which established Agricultural Societies in Upper Canada. In 1836, he appears to have been visited in Pickering by Dr. Thomas Rolph, when making notes for his "Statistical Account of Upper Canada." "The Township of Pickering," Dr. Rolph says, "is well settled and contains some fine land, and well watered. Mr. Fothergill," he continues, "has an extensive and most valuable museum of natural curiosities at his residence in this township, which he has collected with great industry and the most refined taste. He is a person of superior acquirements, and ardently devoted to the pursuit of natural philosophy." P. 189 It was Mr. Fothergill's misfortune to have lived too early in Upper Canada. Many plans of his in the interests of literature and science came to nothing for the want of a sufficient body of seconders. In conjunction with Dr. Dunlop and Dr. Rees, it was the intention of Mr. Fothergill to establish at York a Museum of Natural and Civil History, with a Botanical and Zoological Garden attached; and a grant of land on the Government Reserve between the Garrison and Farr's Brewery was actually secured as a site for the buildings and grounds of the proposed institution. A prospectus now before us sets forth in detail a very comprehensive scheme for this Museum, or Lyceum, which embraced also a picture gallery, "for subjects connected with Science and Portraits of individuals," and did not omit "Indian antiquities, arms, dresses, utensils, and whatever might illustrate and make permanent all that we can know of the Aborigines of this great Continent, a people who are rapidly passing away and becoming as though they had never been." For several years Mr. Fothergill published "The York Almanac and Royal Calendar," which gradually became a volume of between four and five hundred duodecimo pages, filled with practical and official information on the subject of Canada and the other British American Colonies. This work is still often resorted to. Hanging in his study we remember noticing a large engraved map of "CABOTIA." It was a delineation of the British Possessions in North America—the present Dominion of Canada, in fact. It had been his purpose in 1823 to publish a "Canadian Annual Register;" but this he never accomplished. While printing the *Upper Canada Gazette*, he edited in conjunction with that periodical and on the same sheet, the "Weekly Register," bearing the motto, "Our endeavor will be to stamp the very body of the time—its form and pressure: we shall extenuate nothing, nor shall we set down aught in malice." From this publication may be gathered much of the current history of the period. In it are given many curious scientific excerpts from his Common Place Book At a later period he published, at Toronto, a weekly paper in quarto shape, named "The Palladium." Among the non-official advertisements in the *Upper Canada Gazette*, in the year 1823, we observe one signed "Charles Fothergill," offering a reward "even to the full value of the volumes," for the recovery of missing portions of several English standard works which had belonged formerly, the advertisement states, to the "Toronto Library," broken up "by the Americans at the taking of York." It was suggested that probably the missing books were still scattered about, up and down, in the town. It is odd to see the name of "Toronto" cropping out in 1823, in connection with a library. (In a much earlier York paper we notice the "Toronto Coffee House" advertised). Mr. Fothergill belonged to the distinguished Quaker family of that name in Yorkshire. A rather good idea of his character of countenance may be derived from the portrait of Dr. Arnold, prefixed to Stanley's Memoir. An oil painting of him exists, but it has been sent to relatives in England. We observe in Leigh Hunt's *London Journal*, I. 172, a reference to "Fothergill's Essay on the Philosophy, Study and Use of Natural History." If not by our Canadian Fothergill, it was probably

by a near relative of kindred spirit. We give a pathetic extract from a specimen of this production, in the work just referred to: "Never shall I forget," says the essayist, "the remembrance of a little incident which many will deem trifling and unimportant, but which has been peculiarly interesting to my heart, as giving origin to sentiments and rules of action which have since been very dear to me. Besides a singular elegance of form and beauty of plumage," continues the enthusiastic naturalist, "the eye of the common lapwing is peculiarly soft and expressive; it is large, black, and full of lustre, rolling, as it seems to do, in liquid gems of dew. I had shot a bird of this beautiful species; but, on taking it up, I found it was not dead. I had wounded its breast; and some big drops of blood stained the pure whiteness of its feathers. As I held the hapless bird in my hand, hundreds of its companions hovered round my head, uttering continued shrieks of distress, and, by their plaintive cries, appeared to bemoan the fate of one to whom they were connected by ties of the most tender and interesting nature; whilst the poor wounded bird continually moaned, with a kind of inward, wailing note, expressive of the keenest anguish; and, ever and anon, it raised its drooping head, and turning towards the wound in its breast, touched it with its bill, and then looked up in my face, with an expression that I have no wish to forget, for it had power to touch my heart whilst yet a boy, when a thousand dry precepts in the academical closet would have been of no avail." The length of this extract will be pardoned for the sake of its deterrent drift in respect to the wanton maiming and massacre of our feathered fellow-creatures by the firearms of sportsmen and missiles of thoughtless children.

XX.—FROM DON STREET TO THE BRIDGE.

Eastward from the house where we have been pausing, the road took a slight sweep to the south and then came back to its former course towards the Don bridge, descending in the meantime into the valley of a creek or watercourse, and ascending again from it on the other side. Hereabout, to the left, standing on a picturesque knoll and surrounded by the natural woods of the region, was a good sized two-storey dwelling; this was the abode of Mr. David McNab, sergeant-at-arms to the House of Assembly, as his father had been before him. With him resided several accomplished, kind-hearted sisters, all of handsome and even stately presence; one of them the belle of the day in society at York. Here were the quarters of the Chief McNab, whenever he came up to York from his Canadian home on the Ottawa. It was not alone when present at church that this remarkable gentleman attracted the public gaze; but also, when surrounded or followed by a group of his fair kinsfolk of York, he marched with dignified steps along through the whole length of King Street, and down or up the Kingston road to and from the McNab homestead here in the woods near the Don. In his visits to the capital, the Chief always wore a modified highland costume, which well set off his stalwart, upright form: the blue bonnet and feather, and richly embossed dirk, always rendered him conspicuous, as well as the tartan of brilliant hues depending from his shoulder after obliquely swathing his capacious chest: a bright scarlet vest with massive silver buttons, and dress coat always jauntily thrown back, added to the picturesqueness of the figure. It was always evident at a glance that the Chief set a high value on himself.—"May the MacNab of MacNabs have the pleasure of taking wine with Lady Sarah Maitland?" suddenly heard above the buzz of conversation, pronounced in a very deep and measured tone by his manly voice, made mute for a time, on one occasion, the dinner-table at Government House. So the gossip ran. Another story of the same class, but less likely, we should think, to be true, was, that seating himself, without uncovering, in the Court-room one day, a messenger was sent to him by the Chief Justice, Sir William Campbell, on the Bench, requiring the removal of his cap; when the answer returned, as he instantly rose and left the building, was, that "the MacNab of MacNabs doffs his bonnet to no man!"—At his home on the Chats the Emigrant Laird did his best to transplant the traditions and customs of by-gone days in the Highlands, but he found practical Canada an unfriendly soil for romance and sentiment. Bouchette, in his "British Dominions," i. 82, thus refers to the Canadian abode of the Chief and to the settlement formed by the clan MacNab. "High up," [the Ottawa], he says, "on the bold and abrupt shore of the broad and picturesque Lake of the Chats, the Highland Chief MacNab has selected a romantic residence, Kinnell Lodge, which he has succeeded, through the most unshaken perseverance, in rendering

exceedingly comfortable. His unexampled exertions in forming and fostering the settlements of the township, of which he may be considered the founder and the leader, have not been attended with all the success that was desirable, or which he anticipated." Bouchette then appends a note wherein we can see how readily his own demonstrative Gallic nature sympathized with the kindred Celtic spirit of the Highlander. "The characteristic hospitality that distinguished our reception by the gallant Chief," he says, "when, in 1828, we were returning down the Ottawa, after having explored its rapids and lakes, as far up as Grand Calumet, we cannot pass over in silence. To voyageurs in the remote wilds of Canada," he continues, "necessarily strangers for the time to the sweets of civilization, the unexpected comforts of a well-furnished board, and the cordiality of a Highland welcome, are blessings that fall upon the soul like dew upon the flower. 'The sun was just resigning to the moon the empire of the skies,' when we took our leave of the noble chieftain," he adds, "to descend the formidable rapids of the Chats. As we glided from the foot of the bold bank, the gay plaid and cap of the noble Gael were seen waving on the proud eminence, and the shrill notes of the piper filled the air with their wild cadences. They died away as we approached the head of the rapids. Our caps were flourished, and the flags (for our canoe was gaily decorated with them) waved in adieu, and we entered the vortex of the swift and whirling stream." In 1836, Rolph, in his "Statistical Account of Upper Canada," p. 146, also speaks of the site of Kinnell Lodge as "greatly resembling in its bold, sombre and majestic aspect, the wildest and most romantic scenery" of Scotland. "This distinguished Chieftain," the writer then informs us, "has received permission to raise a militia corps of 800 Highlanders, a class of British subjects always distinguished for their devoted and chivalrous attachment to the laws and institutions of their noble progenitors, and who would prove a rampart of living bodies in defence of British supremacy whenever or wherever assailed."

The reference in Dean Ramsey's interesting "Reminiscences of Scottish Life and Character" to "the last Laird of MacNab," is perhaps to the father of the gentleman familiar to us here in York, and who filled so large a space in the recollections of visitors to the Upper Ottawa. "The last Laird of MacNab before the clan finally broke up and emigrated to Canada was," says the Dean in the work just named, "a well-known character in the country; and, being poor, used to ride about on a most wretched horse, which gave occasion to many jibes at his expense. The Laird," this writer continues, "was in the constant habit of riding up from the country to attend the Musselburgh races [near Edinburgh]. A young wit, by way of playing him off on the race course, asked him in a contemptuous tone, "Is that the same horse you had last year, Laird?"—"Na," said the Laird, brandishing his whip in the interrogator's face in so emphatic a manner as to preclude further questioning, "Na! but it's the same *whup!*" (p. 216, 9th ed.)—We do not doubt but that the MacNabs have ever been a spirited race. Their representatives here have always been such; and like their kinsmen in the old home, too, they have had, during their brief history in Canada, their share of the hereditary vicissitudes We owe to a Sheriff's advertisement in the "Upper Canada Gazette or American Oracle" of the 14th of April, 1798, published at Niagara, some biographical particulars and a minute description of the person of the Mr. MacNab who was afterwards, as we have already stated, Usher of the Black Rod to the House of Assembly and father of his successor, Mr. David MacNab, in the same post; father also of the Allan MacNab, whose history forms part of that of Upper Canada. In 1798, imprisonment for debt was the rigorously enforced law of the land. The prominent MacNab of that date had, it would appear, become obnoxious to the law on the score of indebtedness: but finding the restraint imposed irksome, he had relieved himself of it, without asking leave. The hue and cry for his re-capture proceeded as follows: "Two hundred dollars reward! Home District, Upper Canada, Newark, April 2, 1798. Broke the gaol of this District on the night of the 1st instant, [the 1st of April, be it observed,] Allan MacNab, a confined debtor. He is a reduced lieutenant of horse," proceeds the Sheriff, "on the half-pay list of the late corps of Queen's Rangers; aged 38 years or thereabouts; five feet three inches high; fair complexion; light hair; red beard; much marked with the small pox; the middle finger of one of his hands remarkable for an overgrown nail; round shouldered; stoops a little in walking; and although a native of the Highlands of Scotland, affects much in speaking, the Irish dialect. Whoever will apprehend, &c., &c., shall receive the above reward, with all reasonable expenses." The escape of the prisoner on the first of April was probably felt by the

Sheriff to be a practical joke played off on him. We think we detect personal spleen in the terms of the advertisement: in the minuteness of the description of Mr. MacNab's physique, which never claimed to be that of an Adonis; in the biographical particulars, which, however interesting they chance to prove to later generations, were somewhat out of place on such an occasion: as also in a postscript calling on the printers within his Majesty's Governments in America, and those of the United States to give circulation in their respective papers to the above advertisement," &c.

It was a limited exchequer that created embarrassment in the early history—and, for that matter, in much of the later history as well—of Mr. MacNab's distinguished son, afterwards the baronet Sir Allan; and no one could relate with more graphic and humorous effect his troubles from this source, than he was occasionally in the habit of doing. When observing his well-known handsome form and ever-benignant countenance, about in the streets of York, we lads at school were wont, we remember, generally to conjecture that his ramblings were limited to certain bounds. He himself used to dwell with an amount of complacency on the skill acquired in carpentry during these intervals of involuntary leisure, and on the practical results to himself from that skill, not only in the way of pastime, but in the form of hard cash for personal necessities. Many were the panelled doors and venetian shutters in York which, by his account, were the work of his hands.—Once he was on the point of becoming a professional actor. Giving assistance now and then as an anonymous performer to Mr. Archbold, a respectable Manager here, he evinced such marked talent on the boards, that he was seriously advised to adopt the stage as his avocation and employment. The theatre of Canadian public affairs, however, was to be the real scene of his achievements. Particulars are here unnecessary. Successively sailor and soldier (and in both capacities engaged in perilous service); a lawyer, a legislator in both Houses; Speaker twice in the Popular Assembly; once Prime Minister; knighted for gallantry, and appointed an Aide-de-camp to the Queen; dignified with a baronetcy; by the marriage of a daughter with the son of a nobleman, made the possible progenitor of English peers—the career of Allan MacNab cannot fail to arrest the attention of the future investigator of Canadian history.—With our local traditions in relation to the grandiose chieftain above described, one or two stories are in circulation, in which his young kinsman Allan amusingly figures. Alive to pleasantry—as so many of our early worthies in these parts were—he undertook, it is said, for a small wager, to prove the absolute nudity of the knees, &c, of his feudal lord when at a ball in full costume: (the allegation, mischievously made, had been that the Chief was protected from the weather by invisible drawers). The mode of demonstration adopted was a sudden cry from the ingenuous youth addressed to the Chief, to the effect that he observed a spider, or some such object, running up his leg!—a cry instantly followed by a smart slap with the hand, with the presumed intention of checking the onward course of the noxious thing. The loud crack occasioned by the blow left no room for doubt as to the fact of nudity; but the dignified Laird was somewhat disconcerted by the over zeal of his young retainer. Again, at Kingston, the ever-conscious Chief having written himself down in the visitors' book at the hotel as THE MACNAB, his juvenile relative, coming in immediately after and seeing the curt inscription, instantly entered his protest against the monopoly apparently implied, by writing *himself* down, just underneath, in conspicuous characters, as THE OTHER MACNAB—the genius of his coming fortunes doubtless inspiring the merry deed.—We have understood that the house occupied by Mr. Fothergill (where we paused a short time since) was originally put up by Allan MacNab, junior, but never tenanted by him.

XXI.—THE BRIDGE AND ACROSS IT.

We now arrived at the Don bridge. The valley of the Don, at the place where the Kingston Road crosses it, was spanned in 1824 by a long wooden viaduct raised about twenty-five feet above the marsh below. This structure consisted of a series of ten trestles, or frames of hewn timber supporting a roadway of plank. A similar structure spanned the Humber and its marshes on the west side of York. Both of these bridges about the year named had become very much decayed; and occasionally both were rendered impassable at the same time, by the falling in of worn-out and broken planks. The York papers would then make themselves merry on the well defended condition of the town in a military point of view, approach to it

from the east and west being effectually barred. Prior to the erection of this bridge on the Kingston Road, the river was crossed near the same spot by a scow, worked by the assistance of a rope stretched across the stream. In 1810, we observe that the Humber was also crossed by means of a ferry. In that year the inhabitants of Etobicoke complained to the magistrates in session at York of the excessive toll demanded there; and it was agreed that for the future the following should be the charges:—For each foot passenger, 2½d; for every hog, 1d; for every sheep, the same; for horned cattle, 2½d each; for every horse and rider, 5d; for every carriage drawn by two horses, 1s. 3d. (which included the driver); for every carriage with one horse, 1s. It is presumed that the same tolls were exacted at the ferry over the Don, while in operation. In 1824 not only was the Don bridge in bad repair, but, as we learn from a petition addressed by the magistrates to Sir Peregrine Maitland in that year, the bridge over the Rouge in Pickering, also, is said to be, "from its decayed state, almost impassable, and if not remedied," the document goes on to state, "the communication between this town (York) and the eastern parts of the Province, as well as with Lower Canada by land, will be entirely obstructed." At length the present earthwork across the marsh at the Don was thrown up, and the river itself spanned by a long wooden tube, put together on a suspension principle, roofed over and closed in on the sides, with the exception of oblong apertures for light. It resembled in some degree the bridges to be seen over the Reuss at Lucerne and elsewhere in Switzerland, though not decorated with paintings in the interior, as they are. Stone piers built on piles sustained it at either end. All was done under the superintendence of a United States contractor, named Lewis. It was at him that the *italics* in Mr. Angell's advertisements glanced. The innuendo was that, for engineering purposes, there was no necessity for calling in the aid of outsiders. From a kind of small Friar Bacon's study, occupied in former years by ourselves, situated on a bold point some distance northwards, up the valley, we remember watching the pile-driver at work in preparing the foundation of the two stone piers of the Don bridge: from where we sat at our books we could see the heavy mallet descend; and then, after a considerable interval, we would hear the sharp stroke on the end of the piece of timber which was being driven down. From the same elevated position also, previously, we used to see the teams crossing the high frame-work over the marsh on their way to and from Town, and hear the distant clatter of the horses' feet on the loosely-laid planks. The tubular structure that succeeded the tressle-work bridge did not retain its position very long. The pier at its western extremity was undermined by the water during a spring freshet, and gave way. The bridge, of course, fell down into the swirling tide below, and was carried bodily away, looking like a second ark as it floated along towards the mouth of the river, where at length it stranded and became a wreck. On the breaking up of the ice every spring the Don, as is well known, becomes a mighty rushing river, stretching across from hill to hill. Ordinarily, it occupies but a small portion of its proper valley, meandering along, like an English tide-stream when the tide is out. The bridge carried away on this occasion was notable so long as it stood, for retaining visible marks of an attempt to set fire to it during the troubles of 1837. The next appliance for crossing the river was another tubular frame of timber, longer than the former one; but it was never provided with a roof, and never closed in at the sides. Up to the time that it began to show signs of decay, and to require cribs to be built underneath it in the middle of the stream, it had an unfinished, disreputable look. It acquired a tragic interest in 1859, from being the scene of the murder, by drowning, of a young Irishman named Hogan, a barrister, and, at the time, a member of the Parliament of Canada.—When crossing the high tresslework which preceded the present earth-bank, the traveller, on looking down into the marsh below, on the south side, could see the remains of a still earlier structure, a causeway formed of unhewn logs laid side by side in the usual manner, but decayed, and for the most part submerged in water, resembling, as seen from above, some of the lately discovered substructions in the lakes of Switzerland. This was probably the first road by which wheeled vehicles ever crossed the valley of the Don here. On the protruding ends of some of the logs of this causeway would be always seen basking, on a warm summer's day, many fresh-water turtles; amongst which, as also amongst the black snakes, which were likewise always to be seen coiled up in numbers here, and among the shoals of sunfish in the surrounding pools, a great commotion would take place when the jar was felt of a waggon passing over on the framework above. The rest of the marsh, with the exception of the space occupied by the

ancient corduroy causeway, was one thicket of wild willow, alder, and other aquatic shrubbery, among which was conspicuous the *spiræa*, known among boys as "seven-bark" or "nine-bark," and prized by them for the beautiful hue of its rind, which, when rubbed, becomes a bright scarlet. Here also the blue iris grew plentifully, and reeds, frequented by the marsh-hen; and the bulrush, with its long cat-tails, sheathed in chestnut-coloured felt, and pointing upwards like toy sky-rockets ready to be shot off. (These cat-tails, when dry and stripped, expand into large, white, downy spheres of fluff, and actually were as inflammable as gunpowder, going off with a mighty flash at the least touch of fire). The view from the old tresslework bridge, both up and down the stream, was very picturesque, especially when the forest, which clothed the banks of the ravine on the right and left, wore the tints of autumn. Northward, while many fine elms would be seen towering up from the land on a level with the river, the bold hills above them and beyond were covered with lofty pines. Southward, in the distance, was a great stretch of marsh, with the blue lake along the horizon. In the summer this marsh was one vast jungle of tall flags and reeds, where would be found the conical huts of the muskrat, and where would be heard at certain seasons the peculiar *gulp* of the bittern; in winter, when crisp and dry, here was material for a magnificent pyrotechnical display, which usually, once a year, came off, affording at night to the people of the town a spectacle not to be contemned. Through a portion of this marsh on the eastern side of the river, Mr. Justice Boulton, at a very early period, cut, at a great expense, an open channel in front of some property of his: it was expected, we believe, that the matted vegetation on the outer side of this cutting would float away and leave clear water, when thus disengaged; but no such result ensued: the channel, however, has continued open, and is known as the "Boulton ditch." It forms a communication for skiffs between the Don and Ashbridge's Bay. At the west end of the bridge, just across what is now the gore between Queen Street and King Street, there used to be the remains of a military breastwork thrown up in the war of 1812. At the east end of the bridge, on the south side of the road, there still stands a lowly edifice of hewn logs, erected before the close of the last century, by the writer's father, who was the first owner and occupant of the lots on both sides of the Kingston road at this point. The roadway down to the original crossing-place over the river in the days of the Ferry, and the time of the first cordury bridge, swerving as it did considerably to the south from the direct line of the Kingston road, must have been in fact a trespass on his lot on the south side of the road: and we find that so notable an object was the solitary house, just above the bridge, in 1800, that the bridge itself, in popular parlance, was designated by its owner's name. Thus in the Upper Canada *Gazette* for March 8, 1800, we read that at a Town Meeting, Jonathan Ashbridge was appointed overseer of highways and fence-viewer for the section of road "from Scadding's bridge to Scarboro'." In 1802 Mr. Ashbridge is again appointed to the same office, and the section of highway placed under his charge is on this occasion named "the Bay Road from Scadding's bridge to Scarboro'." (On this occasion Mr. John Playter is appointed overseer of highways "from the Bay Road to the Don Mills."—During the absence in England of the builder and owner of the house just referred to, it was occupied by Mr. Playter, before the erection of his own residence; and here his eldest son, Mr. Emanuel Playter, was born). Mr. Ashbridge is the early settler from whom Ashbridge's Bay has its name. His farm lay along the lower portion of that sheet of water. Next to him, westward, was the property of Mr. Hastings, whose Christian name was Warren. Years ago, when first beginning to read Burke, we remember wondering why the name of "the great proconsul" of Hindostan looked so familiar to the eye: when we recollected that in our childhood we used frequently to see here along the old Kingston road the name WARREN HASTINGS appended in conspicuous characters, to placards posted up, advertising a "Lost Cow," or some other homely animal, gone astray. Adjoining Mr. Hastings' farm, still moving west, was that of Mr. Mills, with whose name in our own mind is associated the memory of "Hannah Mills," an unmarried member of his household, who was the Sister of Charity of the neighbourhood, ever ready in times of sickness and bereavement to render, for days and nights together, kindly, sympathetic and consolatory aid.—We transcribe the full list of the appointments at the Town Meeting of 1800, for the sake of other old locally-familiar names therein embodied; and also as showing the curious and almost incredible fact that in the language of the people, York at that early period, 1800, was beginning to be entitled "the City of York!" "Persons elected at the Town Meeting, held at Miles' Tavern, in the *City of York*, on the 3rd day of March, 1800.

Town clerk, Mr. Edward Hayward, sworn. Assessors: Elisha Beaman and John Ashbridge. Collector: Mr. Jacob Herchmer. Overseer of Highways and Roads, and Fence-viewers: Jonathan Ashbridge, from Scadding's Bridge to Scarboro'. Parshall Terry, from the Bay Road to the Mills. Elias Anderson, Circle of the Humber: sworn. Mal. Wright, Yonge Street, from half Big-Creek bridge to No. 1, inclusive. John Endicott, west end of the city[1]. Edward Wright, do., east end. David Thompson, for Scarboro': all sworn. Pound-keepers: Alexander Galloway, Circle of the Don. John Dennis, do. Humber. John Eomen, sen., Yonge street No. 10 to 25. David Laughton for the City. Town-wardens, sworn: Ephraim Payson, Andrew Thomson. Constables, sworn: John Matthews, Eliphalet Hale, Nat. Jackson, for the City. John Haines for the Humber, and Thomas Gray for Yonge Street." At the same meeting the following understanding was arrived at: "It is agreed by the majority of the inhabitants of the Town that no Logs of any description shall be allowed to run at large within the limits of the City from and after the first day of May next ensuing; and it is further agreed by a majority that every person or persons shall be liable to pay the sum of five shillings lawful currency for each time and for each hog found running at large after that period. It is further agreed that all persons who keep hogs shall cause them to be marked, which mark shall be registered with the town clerk It is further understood that hogs shall run at large in the country as usual. —The majority of the inhabitants agree that all fences shall be five feet high."—When, in 1800 staid inhabitants were found seriously dignifying the group of buildings then to be seen on the borders of the bay, with the magnificent appellation of the "City of York," it is no wonder that at a later period indignation is frequently expressed at the ignominious epithet of "Little," which persons in the United States were fond of prefixing to the name of the place. Thus for example, in the *Weekly Register* so late as June, 1822, we have the editor speaking thus in a notice to a correspondent: "Our friend on the banks of the Ohio, 45 miles below Pittsburg, will perceive," the editor remarks, "that notwithstanding he has made us pay postage [and postage in those days was heavy], we have not been unmindful of his request. We shall always be ready at the call of charity when not misapplied; and we hope the family in question will be successful in their object.—There is one hint, however," the editor goes on to say, "we wish to give Mr. W. Patton, P. M.; which is, although there may be many "*Little*" Yorks in the United States, we know of no place called "*Little York*" in Canada; and beg that he will bear this *little* circumstance in his recollection when he again addresses us." Gourlay also, as we have seen, when he wished to speak cuttingly of the authorities at York, used the same epithet. In gubernatorial proclamations, the phrase modestly employed is—"OUR TOWN OF YORK."

A short distance east from the bridge a road turned northward, known as the "Mill road." It led to the multifarious works, flour-mills, saw-mills, fulling mills, carding-mills, paper-mill, and breweries, founded, in the first instance, by the Helliwells, a vigorous and substantial Yorkshire family, whose heads first settled and commenced operations on the very brink of Niagara Falls, on the Canadian side, but then transferred themselves to the upper valley of the Don, where that river becomes a shallow, rapid stream, and where the surroundings are, on a small scale, quite Alpine in character—a secluded spot at the time, in the rudest state of nature, a favourite haunt of wolves, bears and deer; a spot presenting difficulties peculiarly formidable for the new settler to grapple with, from the loftiness and steepness of the hills and the kind of timber growing thereabout, massive pines for the most part. Associated with the Helliwells in their various enterprises, and allied to them by copartnerships and intermarriage, were the Eastwoods and Skinners, all shrewd and persevering folk of the Midland and North country English stock. It was Mr. Eastwood who gave the name of Todmorden to the village overlooking the mills. Farther up the river, on the hills to the right, were the Sinclairs, very early settlers from New England: and beyond, descending again into the vale, the Taylors and Leas, substantial and enterprising emigrants from England. Hereabout were the "Forks of the Don," where the west branch of that stream, seen at York Mills, enters. The hills in this neighbourhood are lofty and precipitous, and the pines that clothed them were of a remarkably fine growth. The tedious circuit which teams were obliged to make in order to get into the town from these regions by the Don bridge, has since been, to some extent, obviated by the erection of two additional bridges at points higher up the stream, north of the Kingston road.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JANUARY, 1869.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario, 108 feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in Inches.	Snow in Inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	9 A.M.	2 P.M.	10 P.M	MEAN		6 A.M.	2 P.M.	10 P.M	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	MEAN.		
					°	°	°	°	°																		
1	29.918	29.877	29.855	29.8732	12.9	17.4	9	9.3	−13.77	.063	.057	.057	.061	80	78	80	83	ENE	ENE	NE b E	N 66 E	18.2	15.6	14.6	16.62	17.01	...	4.5
2	.650	.467	.437	.5247	23.0	39.9	31.5	29.5	+ 4.45	.106	.157	.181	.148	86	90	87	88	E S E	S E	W b S	S 15 W	15.5	7.8	14.4	3.82	10.59	...	4.0
3	.615	.627	—	—	31.6	35.3	—	—	—	.163	.189	—	—	91	92	—	—	W S W	S W	E S E	S 3 W	9.4	6.5	2.7	2.46	4.46	...	...
4	.428	.254	.213	.3178	36.0	41.7	38.5	38.87	+13.72	.189	.218	.173	.194	89	82	85	81	S E b E	S S W	S W	S 48 W	6.0	10.0	15.8	5.17	7.33	...	...
5	.278	.300	.350	.3760	35.2	34.9	28.4	32.77	+ 7.63	.183	.118	.134	.145	89	57	60	78	S W	W b N	W	N 83 W	6.2	16.5	10.6	11.76	12.59	...	inap.
6	.533	.472	.496	.5167	29.8	30.7	31.8	32.48	+ 7.38	.147	.128	.153	.141	88	59	65	77	S W	W b S	S W	S 55 W	13.0	9.0	0.6	6.97	7.08	...	...
7	.570	.491	.522	.5655	34.9	43.2	40.7	39.27	+14.13	.178	.181	.170	.173	87	64	62	72	S W	S W	S W b W	S 60 W	6.6	9.0	6.6	5.94	6.27	...	...
8	.683	.728	.728	.6545	36.3	35.2	33.8	34.75	+ 9.62	.193	.140	.183	.170	90	68	94	84	N b W	N E	E b S	N 89 E	0.6	8.2	18.4	9.04	9.40	0.625	0.2
9	.242	.074	.178	.2328	39.6	43.5	34.9	38.83	+13.72	.237	.250	.176	.204	97	89	86	85	S E b E	S W	S W b W	S 68 W	7.4	11.5	6.2	7.58	9.45	.055	...
10	.550	.087	—	—	30.9	34.5	—	—	—	.149	.148	—	—	86	74	—	—	N W b W	N W	Calm.	N 43 W	4.6	12.2	0.0	3.81	4.01	...	inap.
11	.800	.672	.640	.6462	28.4	30.2	27.0	28.40	+ 3.35	.134	.142	.129	.131	86	83	88	86	W N W	E b S	N E b N	N 34 E	1.5	7.0	7.2	8.04	9.90	...	0.4
12	.531	.676	.718	.6940	23.3	28.4	22.3	24.30	— 0.78	.103	.090	.092	.091	82	57	77	80	N	N W b N	N W b W	N 27 W	15.4	7.5	3.6	6.11	6.38	...	...
13	.855	.768	.764	.7745	20.8	34.5	32.4	29.12	+ 4.03	.099	.148	.138	.125	81	74	75	77	N W b W	S W b S	S W	S 46 W	0.8	14.4	12.6	8.72	8.96	...	...
14	.668	.612	.620	.6045	29.1	33.6	33.1	32.05	+ 7.85	.141	.182	.167	.159	87	78	88	84	W S W	S W	W b S	S 59 W	7.0	10.0	6.4	8.23	8.52	...	...
15	.482	.448	.472	.5047	30.9	34.6	27.0	30.73	+ 5.63	.157	.114	.107	.122	90	57	73	71	W b S	N N W	N W b N	N 26 W	5.0	9.0	15.0	9.76	10.09	...	...
16	.762	.700	.809	.7880	17.9	31.3	24.8	24.12	— 0.88	.079	.107	.105	.096	80	60	79	74	N N W	S S W	S W b W	S 83 W	3.5	5.0	1.2	2.63	3.43	...	...
17	.770	.731	—	—	21.0	31.3	—	—	—	.105	.152	—	—	89	86	—	—	S W b W	E b N	E N E	N 69 E	5.0	13.5	8.7	8.01	8.98	...	...
18	.819	.786	.800	.8127	19.0	20.5	20.5	19.93	— 5.03	.091	.061	.086	.075	89	65	79	70	N E	N E b N	N E b N	N 39 E	8.0	5.6	3.5	4.00	4.00	...	inap.
19	.795	.631	.591	.6080	21.9	29.6	29.5	27.33	+ 2.45	.097	.125	.121	.115	82	75	74	77	N E b N	S W b W	S W b W	S 59 W	0.8	9.6	17.8	8.77	10.07	...	0.1
20	.338	.425	.509	.4577	29.5	28.0	20.1	25.77	+ 0.92	.158	.117	.091	.120	97	76	85	84	S W b W	N N W	N W b W	N 54 W	10.0	20.0	2.2	9.88	11.23	...	0.2
21	.362	.288	.338	.4202	25.2	35.3	17.2	25.47	+ 0.68	.122	.134	.056	.108	90	65	57	75	S W b S	W	N N E	N 40 W	1.0	22.0	15.6	8.91	13.87	...	inap.
22	.740	.771	.763	.7148	6.8	14.3	11.8	12.35	−12.42	.051	.054	.063	.059	80	63	86	77	N	N W b W	W b N	N 89 W	9.0	7.0	3.0	5.04	8.22	...	...
23	.334	.228	.248	.2863	25.5	39.9	33.1	32.9	+ 8.23	.125	.112	.167	.140	91	44	88	76	S W b W	W b S	S W b W	S 68 W	16.2	14.5	8.8	11.12	11.67	...	...
24	.267	.139	—	—	32.0	34.9	—	—	—	.158	.162	—	—	87	70	—	—	S W b W	S W b S	N N W	N 45 W	6.0	2.0	26.6	9.71	12.56	...	...
25	.549	.679	.703	.6828	1.7	11.1	7.5	6.63	−17.93	.044	.047	.049	.047	91	65	78	79	N	N N W	N N W	N 27 W	14.8	14.6	10.6	8.88	10.01	...	...
26	.740	.767	.777	.7803	13.6	22.9	13.6	16.63	− 7.83	.072	.104	.072	.080	90	80	90	86	S W b W	W b N	Calm.	S 80 W	11.6	15.6	0.0	7.54	7.72	...	inap.
27	.715	.540	.520	.5668	14.3	33.1	30.2	26.17	+ 1.82	.076	.167	.128	.123	92	88	76	84	W b N	S W	W S W	S 54 W	4.9	6.8	7.6	5.23	5.44	...	...
28	.480	.610	.639	.5922	30.2	36.7	32.4	33.27	+ 8.07	.149	.137	.153	.147	89	63	83	78	W S W	W S W	S W b W	S 71 W	1.8	12.6	1.0	5.24	5.44	...	...
29	.650	.507	.466	.4762	33.8	36.3	34.9	34.75	+19.57	.173	.176	.186	.177	89	82	92	88	S S E	E b N	E	N 85 E	0.6	13.0	13.2	10.66	10.84	1.65	...
30	.090	.157	.261	.2483	35.6	37.4	25.6	31.52	+ 7.42	.203	.170	.104	.154	97	76	77	85	E	W	W b N	N 80 W	3.6	16.5	18.6	13.59	15.05	0.42	0.4
31	.583	.666	—	—	18.3	23.3	—	—	—	.080	.088	—	—	81	70	—	—	W b N	N W b N	N W b W	N 49 W	22.6	19.4	6.7	14.39	14.52	...	...
	29.5178	29.5386	29.5558	29.5662	25 20	31.63	26.72	27.71	+ 2.91	.129	.132	.125	.127	88	71	81	80	.....	.....	.....	.....	7.60	4.35	9.01	.....	9.21	9.887	9.8

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JANUARY, 1869.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.877 at 2 p.m. on 1st. } Monthly range—
Lowest Barometer.....29.074 at 8 a.m. on 9th. } 0.803.

Self-registering Thor.

Maximum Temperature .....45°0 on 7th & 9th. } Monthly range—
Minimum Temperature .....—1°0 on 25th. } 46°0.
Mean Maximum Temperature .....34°59. } Mean daily range—
Mean Minimum Temperature .....21°95. } 12°64.
Greatest daily range.....38°6 from a.m. to p.m. of 23rd.
Least daily range ..... 2°2 from a.m. to p.m. of 5th.

Warmest day..... 7th...Mean Temperature.....30°27. } Difference=32°62.
Coldest day .....25th...Mean Temperature..... 0°65. }

Maximum Radiation. { Solar .....57°8 on 7th. } Monthly range—
Terrestrial ... .—5°2 on 26th. } 63°0.

Aurora observed on 2 nights, viz.: 6th, and 7th.

Possible to see Aurora on 14 nights; impossible on 17 nights.

Snowing on 12 days; depth 9.8; duration of fall 68.5.

Raining on 4 days; depth 0.887 inches; duration of fall 17.5 hours.

Mean of Cloudiness=0.68.

Resultant Direction N. 72° W.; Resultant Velocity 3.40.

Mean Velocity 9.21 miles per hour.

Maximum Velocity 32.4 miles, from 11 a.m. to noon of 20th.

Most Windy day 1st; Mean Velocity 17.01 miles per hour.
Least Windy day 16th; Mean Velocity 3.43 miles per hour.

Most Windy hour noon; Mean Velocity 11.54 miles per hour.
Least Windy hour 5 a.m.; Mean Velocity 7.27 miles per hour.

25th. Lunar halo.
27th. Solar halo.
28th. Lunar halo.
30th. Dense fog.

COMPARATIVE TABLE FOR JANUARY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1841	25.6	+ 2.7	42.3	— 6.4	48.7	2	2.150	14	...	...	...	0.36 lbs
1842	27.9	+ 5.0	49.4	1.9	47.5	6	2.170	9	...	...	...	0.78
1843	28.7	+ 5.8	55.4	— 1.6	57.1	6	4.295	12	14.2	...	...	0.69
1844	20.2	— 2.7	45.3	— 7.2	52.5	7	3.005	11	24.9	...	...	0.70
1845	26.5	+ 3.6	45.7	— 0.2	45.9	5	[imper.	9	22.7	...	...	0.70
1846	26.7	+ 3.8	44.0	— 1.3	45.3	5	2.335	10	6.0	...	...	0.55
1847	23.3	+ 0.4	42.4	2.7	39.7	7	2.135	5	7.5	...	...	1.09
1848	28.7	+ 5.8	51.1	—11.4	62.5	7	2.245	8	7.1	N 82 W	2.03	5.82 mls
1849	18.5	— 4.1	39.5	—14.2	53.7	4	1.175	10	9.2	N 63 W	3.06	6.71
1850	29.7	+ 6.8	46.4	9.9	36.5	5	1.250	8	5.2	N 37 W	0.69	5.80
1851	25.5	+ 2.6	43.4	—12.8	56.2	4	1.276	10	7.8	S 77 W	3.26	7.69
1852	18.4	— 4.6	37.3	—10.0	47.3	0	0.000	19	30.9	N 68 W	3.14	7.67
1853	23.0	+ 0.1	40.9	— 9.7	50.6	1	0·290	6	7.5	N 27 W	2.52	6.34
1854	23.6	+ 0.7	46.4	— 5.4	51.8	7	1·270	11	7.5	N 77 W	2.44	6.91
1855	25.9	+ 3.0	49.0	— 5.4	54.4	5	0.525	13	23.3	N 73 W	1.91	7.26
1856	16.0	— 6.9	34.4	—12.0	46.4	0	0.000	14	13.6	N 75 W	5.24	10.69
1857	12.8	—10.1	37.2	—20.1	57.3	3	[nap.	16	21.8	N 70 W	4.96	10.31
1858	30.0	+ 7.1	47.4	0.5	46.9	6	1.162	11	4.0	N 71 W	2.33	7.40
1859	20.4	+ 3.5	43.2	—26.5	69.7	6	1.449	19	10.4	S 81 W	3.17	8.76
1860	23.4	+ 0.5	46.4	— 6.8	53.2	6	0.740	16	8.7	N 89 W	6.09	9.37
1861	10.9	— 3.0	37.0	—11.2	48.2	4	0.685	23	20.6	N 86 W	2.92	9.30
1862	21.7	— 1.2	44.5	— 2.0	47.1	5	0.115	19	27.4	N 26 W	2.69	8.83
1863	28.1	+ 5.2	47.0	—14.0	61.0	10	1.122	17	20.6	N 61 W	1.13	7.23
1864	22.8	— 0.1	44.2	— 9.0	53.2	5	1.165	14	26.3	S 73 W	6.06	10.22
1865	17.7	— 5.2	37.2	— 9.0	46.2	1	0.440	18	14.8	N 85 W	4.80	9.39
1866	20.7	— 2.2	44.0	—14.0	58.0	4	0.522	19	10.3	N 75 W	2.98	9.34
1867	17.6	— 5.3	43.8	— 4.8	48.6	1	[nap.	21	42.0	N 55 W	3.27	6.96
1868	19.0	— 3.9	59.0	— 7.0	46.0	2	[nap	21	14.6	S 83 W	3.97	8.90
1869	27.7	+ 4.8	45.0	— 1.0	46.0	4	0.887	12	9·8	N 72 W	3.40	9.21
Results to 1869.	22.94	...	43.47	—7.62	51.09	4.33	1.175	13.59	15.90	N 78 W	3.00	8.14
Excess for 1868	+ 4.77	...	+ 1.53	+ 6.02	— 5.09	0.38	0.288	1.59	6.10	...	...	+ 1.07

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—FEBRUARY 1869.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in Inches.	Snow in Inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Resl'tant.	MEAN		
					°	°	°	°	°												°							
1	30.026	30.021	30.068	30.0570	18.3	27.3	18.6	20.43	— 2.12	.087	.076	.076	.077	87	52	76	72	N W b W	N W b W	N N E	N 21 W	7.8	7.0	8.0	4.66	7.50	...	...
2	30.043	29.861	29.665	29.8363	20.1	26.6	27.7	24.37	+ 1.75	.091	.105	.142	.111	85	73	94	84	N E b E	E b S	E N E	E	9.0	16.6	22.0	16.34	16.79	...	6.0
3	29.421	.249	.103	.2397	29.5	27.7	20.6	24.87	+ 2.20	.150	.128	.093	.119	92	84	85	85	E	N E	N b E	N 21 E	16.5	12.5	20.2	16.22	18.44	...	4.0
4	.049	.119	.268	.1600	11.1	14.0	19.4	14.47	— 8.25	.060	.062	.093	.071	83	76	89	83	N N W	N N W	N N W	N 24 W	26.4	19.7	23.5	23.38	23.39	...	0.3
5	.375	.613	.663	.5735	11.4	24.8	23.3	20.32	— 2.47	.057	.065	.089	.072	77	47	71	66	N N W	N W b N	W b S	N 54 W	30.6	18.2	4.0	9.89	11.73	...	...
6	.695	.719	.832	.7790	23.3	29.8	29.1	27.18	+ 4.35	.089	.125	.141	.118	71	76	87	79	W	W S W	N N W	N 03 W	11.6	10.6	7.0	6.00	9.48	...	...
7	30.021	30.081	—	—	12.3	21.9	—	—	—	.069	.071	—	—	89	61	—	—	N	E N E	E b S	N 62 E	6.3	3.5	6.0	3.63	4.50	...	...
8	29.688	29.806	.827	.8400	21.5	29.1	28.0	26.28	+ 4.02	.104	.14·	.146	.136	90	92	95	92	E b N	Calm.	Calm.	N 73 E	4.8	0.0	0.0	1.63	1.63	...	0.5
9	.768	.659	.636	.6850	29.1	33.3	31.0	31.37	+ 8.33	.148	.158	.161	.152	92	83	85	87	E b N	E b N	E b N	N 85 E	2.2	5.0	1.8	3.19	3.30	...	...
10	.625	.612	.610	.6157	30.0	36.0	34.2	33.70	+10.63	.149	.172	.177	.166	86	81	89	85	E b N	Calm.	S W b S	S 41 W	0.6	0.0	8.0	2.48	5.09	...	0.2
11	.566	.766	.878	.7522	33.1	41.0	29.1	34.85	+11.68	.167	.131	.133	.135	88	51	82	68	W N W	N W	Calm.	N 56 W	15.2	18.0	0.0	8.39	8.50	...	...
12	.749	.535	.612	.6302	28.4	42.5	41.0	37.77	+14.52	.134	.207	.200	.184	86	76	78	80	Calm.	S W b W	N	S 59 W	0.0	5.4	12.0	1.67	3.92	...	...
13	.594	.590	.685	.6283	35.2	38.0	35.2	36.27	+12.95	.183	.185	.190	.178	89	78	93	83	N	N	N E b E	N 55 E	2.0	8.2	8.0	5.63	6.90	.160	0.4
14	.705	.490	—	—	25.6	24.4	—	—	—	.134	.117	—	—	93	89	—	—	E b N	E b N	E b N	N 78 E	18.8	21.0	17.0	16.85	16.93	...	5.0
15	.200	.125	.176	.1433	33.1	34.9	33.1	34.00	+10.50	.174	.186	.167	.169	92	92	86	87	N E	W b S	S W b W	N 82 W	6.0	5.8	2.0	5.21	7.09	...	0.2
16	.272	.290	.341	.3025	28.0	29.1	25.6	27.35	+ 3.77	.189	.116	.118	.124	90	73	86	83	W b S	W N W	W b N	N 88 W	10.0	15.8	1.4	9.08	9.44	...	0.2
17	.190	28.075	28.001	.0180	30.2	34.9	33.1	32.53	+ 8.83	.149	.186	.174	.165	89	92	92	89	W S W	S W b S	S W b W	N 82 W	8.4	14.5	6.0	9.27	14.32	.005	0.2
18	.103	29.136	29.091	.1038	18.3	24.8	20.8	22.33	— 1.47	.087	.078	.090	.091	87	58	81	76	N W	W N W	N W b W	N 59 W	18.6	6.6	2.6	6.57	8.73	...	0.7
19	28.998	.356	.445	.2938	19.0	22.3	19.7	20.65	— 3.25	.091	.066	.090	.082	89	56	84	75	W b S	W	W b S	N 87 W	22.0	25.5	2.6	13.14	13.86	...	0.2
20	29.426	.509	.714	.5603	20.6	25.2	19.7	23.28	— 0.77	.126	.087	.064	.092	87	63	61	72	W S W	N	N	N 13 W	9.6	12.8	9.4	5.02	6.86	...	0.1
21	.729	.628	—	—	10.9	14.7	—	—	—	.065	.067	—	—	70	78	—	—	N E b N	N N E	N	N 13 E	3.6	11.0	9.4	7.16	7.43	...	5.5
22	.646	.634	.541	.6895	15.4	21.5	18.6	18.57	— 5.75	.077	.069	.083	.080	87	69	83	79	N b W	N	N	N 20 E	5.0	5.2	7.0	5.64	6.09	...	3.0
23	.125	.024	.431	.1807	17.9	19.4	10.0	15.20	— 9.28	.086	.087	.061	.078	87	83	89	86	N E b E	N W b W	N W b W	N 27 W	17.0	20.5	5.5	11.51	13.73	...	9.0
24	.485	.695	.899	.6770	17.9	23.2	12.2	17.76	— 6.87	.072	.054	.065	.066	74	44	86	70	S W b W	W	W N W	S 86 W	15.0	16.2	5.4	10.27	10.87	...	0.2
25	.956	.853	.773	.8543	4.9	24.1	21.2	17.70	— 7.10	.045	.093	.099	.081	82	72	86	80	W	S W	Calm.	S 30 W	6.0	11.8	0.0	6.15	9.53	...	3.5
26	.392	.263	.316	.3170	31.3	33.4	23.8	28.62	+ 3.62	.166	.171	.103	.138	94	89	82	86	S	W S W	S W b W	S 65 W	13.8	15.0	8.5	9.30	14.14	...	0.5
27	.310	.495	.782	.5595	11.8	12.5	4.6	9.60	—16.57	.058	.055	.045	.051	77	73	84	78	N W	N W b N	W N W	N 44 W	31.0	27.0	6.0	17.34	17.63	...	...
28	.843	.868	—	—	8.2	21.2	—	—	—	.057	.099	—	—	91	86	—	—	N W	N W	W b S	N 79 W	1.8	2.0	4.5	2.84	3.21	...	...
	29.4020	29.4027	29.5553	29.5162	22.76	28.18	24.15	24.96	+ 1.62	.102	.117	.116	.114	86	72	84	80	.....	.....	.....	.....	11.41	12.19	7.35	...	10.04	.165	39.7

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR FEBRUARY, 1869.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.088 at 10 p. m. on 1st. } Monthly range=
Lowest Barometer .....28.845 at 0 a. m. on 23rd. } 1.243.

Self-registering Ther.

Maximum temperature.....46°0 on 12th. } Monthly range=
Minimum temperature .....—1°0 on 28th. } 47°0

Mean maximum temperature .....35°32 } Mean daily range=
Mean minimum temperature .....20°31 } 15°01

Greatest daily range.....23°0 from a.m. to p.m. of 28th.
Least daily range..... 2°8 from a m. to p.m. of 21st.

Warmest day..... 12th...Mean temperature .....37°77 }
Coldest day..... 27th...Mean temperature ..... 8°60 } Difference=29°17.

Maximum Radiation { Solar ..... 57°2 on 12th } Monthly range=66°7.
{ Terrestrial .....—9°5 on 25th }

Aurora observed on 3 nights, viz.: 5th, 6th, and 11th.
Possible to see aurora on 11 nights; impossible on 17 nights.
Snowing on 19 days; depth, 39.7 inches; duration of fall, 116.6 hours.
Raining on 2 days; depth, 0.165 inches; duration of fall, 7.0 hours.
Mean of cloudiness=0.75.

Resultant direction, N. 34° W.; Resultant velocity, 4.18.
Mean velocity, 10.04 miles per hour.
Maximum velocity, 31.5 miles, from 5 to 6 p.m. of 27th.
Most windy day, 4th; mean velocity, 23.39 miles per hour.
Least windy day, 8th; mean velocity, 1.63 miles per hour.
Most windy hour, 9 a.m.; mean velocity, 12.53 miles per hour.
Least windy hour, 8 p m.; mean velocity, 6.70 miles per hour.

18th, Lunar halo. 19th, Lunar halo.
22nd, Lunar halo. 23rd, Solar halo.

COMPARATIVE TABLE FOR FEBRUARY.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1841	22.4	— 0.6	44.1	— 1.3	45.4	1	inap.	9	...	...	...	0.61 lbs
1842	26.9	+ 3.9	50.2	2.9	47.3	8	3.625	9	...	...	...	1.03
1843	14.5	— 8.5	38.5	— 9.4	47.9	1	0.475	21	14.4	...	...	1.05
1844	26.0	+ 3.0	47.9	0.6	47.3	4	0.430	7	10.0	...	...	0.43
1845	26.0	+ 3.0	49.1	— 4.2	53.3	5	imp.	9	19.0	...	...	0.99
1846	20.4	— 2.6	41.9	—16.7	58.6	0	0.000	13	46.1	...	...	0.65
1847	21.5	— 1.5	40.9	0.0	40.9	2	0.550	13	27.3	...	...	0.69
1848	26.6	+ 3.6	46.6	0.0	46.6	4	0.775	8	10.5	N 65 W	2.53	5.69 m.
1849	19.5	— 3.5	40.6	— 9.8	50.4	2	0.240	13	19.2	N 41 W	1.48	6.58
1850	26.0	+ 3.0	49.6	2.2	47.4	7	1.235	9	23.1	N 80 W	3.43	7.61
1851	27.6	+ 4.6	50.2	2.0	48.2	7	2.600	4	2.4	N 64 W	1.99	6.04
1852	23.4	+ 0.4	41.2	— 6.2	47.4	3	0.650	11	13.0	S 76 W	3.34	6.42
1853	24.1	+ 1.1	43.4	— 1.4	44.8	4	1.030	15	12.6	N 49 W	2.51	7.30
1854	21.1	— 1.9	42.8	—10.8	53.6	5	1.460	15	18.0	N 7 E	1.75	6.91
1855	15.4	— 7.6	39.0	—25.4	64.4	2	1.770	14	21.8	N 40 W	4.34	8.17
1856	15.7	— 7.3	37.8	—18.7	56.5	0	0.000	8	9.7	N 81 W	7.76	10.71
1857	28.5	+ 5.6	62.4	— 5.9	68.3	11	3.050	11	11.7	S 78 W	3.06	9.82
1858	17.0	— 6.0	42.4	— 7.3	49.7	1	inap.	16	26.7	N 72 W	3.22	9.12
1859	20.0	+ 3.0	46.2	2.1	44.1	6	0.455	14	8.3	N 54 W	2.72	8.50
1860	22.8	— 0.2	50.2	— 8.5	58.7	7	1.330	13	18.8	N 61 W	3.25	8.73
1861	26.1	+ 3.1	46.0	—20.8	66.8	4	0.815	17	29.7	N 77 W	3.80	10.58
1862	22.5	— 0.5	37.8	— 5.2	43.0	3	0.180	17	23.1	N 55 W	3.92	8.52
1863	22.4	— 0.6	41.6	—19.8	61.3	7	1.450	12	22.0	N 23 W	2.27	10.13
1864	24.3	+ 1.3	45.0	—15.0	60.0	2	0.397	14	9.5	S 84 W	6.48	10.11
1865	22.4	— 0.6	42.2	—10.0	52.2	5	0.810	11	16.8	N 23 W	3.93	8.23
1866	22.5	— 0.5	45.0	— 8.0	53.0	3	0.830	12	16.9	S 80 W	5.14	9.40
1867	28.9	+ 5.9	44.0	0.2	43.8	8	1.328	13	13.4	N 57 W	1.58	8.85
1868	17.2	— 5.8	45.0	—11.5	56.5	1	0.040	16	32.8	N 69 W	3.25	10.84
1869	25.0	+ 2.0	46.0	— 1.0	47.0	2	0.165	19	39.7	N 34 W	4.18	10.04
Results to 1868	22.95	.....	44.34	—7.35	51.69	4.17	0.965	12.07	18.35	N 69 W	3.10	8.53
Excess for 1869	+ 2.01	.....	+ 1.66	+ 6.35	— 4.69	— 2.17	— 0.800	+ 6.93	+ 21.35	...	...	+ 1.51

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MARCH, 1868.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 103 *feet.*

Day.	Barom. at temp. of 32° 6 A.M.	2 P.M.	10 P.M	Mean.	Temp. of the Air. 6 A.M	2 P.M.	10 P.M	M'N	Excess of Mean above Normal	Tension of Vapour. 6 A.M.	2 P.M.	10 P.M	M'N	Humidity of Air. 6 A.M	2 P.M	10 P.M.	M'N	Direction of Wind. 6 A.M.	2 P.M.	10 P.M	Resultant.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Result'.	M'N	Rain in Inches.	Snow in Inches.
1	29.798	29.658	29.635	29.6450	8.6	23.0	19.4	16.83	— 8.75	.058	.077	.058	.074	91	63	83	79	Calm.	s w b w	s b w	s 24 w	0.0	8.0	3.5	3.70	4.16	...	0.1
2	.353	.345	.431	.3812	17.9	28.4	27.7	25.22	— 0.55	.091	.126	.142	.122	94	81	94	89	Calm.	s b w	w	0.0	0.0	1.0	1.64	2.33	...	1.0
3	.583	.644	.558	.5968	26.2	34.2	32.0	30.83	+ 4.62	.124	.147	.108	.141	87	75	87	83	W N W	s s W	s W	s 79 W	10.7	13.4	12.0	7.22	11.62	...	...
4	.640	.820	.815	.7708	11.1	5.3	0.6	5.12	—21.12	.060	.041	.040	.045	83	72	88	80	N N W	N N W	N W b W	N 33 W	21.0	12.0	6.8	7.43	8.43	...	...
5	.705	.501	.370	.5102	—4.1	16.1	14.7	9.25	—17.27	.033	.068	.072	.059	93	76	85	84	Calm.	s W	W s W	s 54 W	0.0	20.6	8.6	9.19	9.32	...	0.1
6	.269	.507	.890	.5912	14.3	18.3	11.4	13.83	—12.93	.071	.062	.062	.062	86	61	85	75	W S W	W b N	N W b W	N 55 W	2.0	19.0	9.0	12.72	13.33	...	...
7	30.060	30.011	—	—	12.2	19.4	—	—	—	.059	.080	—	—	78	76	—	—	S W b W	S W	W S W	S 61 W	3.2	10.5	8.6	8.59	8.72	...	...
8	29.897	29.850	.792	.8467	20.5	31.3	26.6	26.12	— 1.18	.093	.100	.105	.101	85	66	73	72	Calm.	W b S	Calm.	S 78 W	0.0	8.8	0.0	3.64	3.78	...	...
9	.708	.732	.678	.7293	21.9	35.3	32.7	29.97	+ 2.45	.105	.163	.165	.138	89	75	88	82	Calm	S S W	Calm.	S 72 W	0.0	11.0	0.0	1.28	4.71	...	Snap.
10	.553	.279	.475	.4270	29.1	16.1	9.3	18.12	— 9.76	.148	.081	.066	.096	92	90	93	89	N N E	N N E	N W	N 10 W	9.2	12.6	26.2	10.69	13.57	...	8.0
11	.776	.771	.723	.7537	1.0	19.7	[illegible]	11.08	—16.44	.041	.071	.067	.059	88	66	83	78	W b N	S W b	W b S	S 84 W	1.6	1.5	3.5	1.62	1.71	...	...
12	.692	.496	.266	.4650	1.0	20.0	25.[illegible]	16.77	— 9.72	.041	.072	.115	.081	88	49	85	77	Calm.	S b W	S b W	S 35 W	0.0	9.0	7.0	6.68	8.25	...	2.5
13	.380	.432	.479	.4425	19.0	28.8	21.2	22.82	— 5.05	.091	.100	.092	.092	89	62	81	76	W b S	W S W	Calm.	S 53 W	11.8	8.6	0.0	6.96	7.09	...	...
14	.259	.377	—	—	27.7	32.0	—	—	—	.135	.085	—	—	89	45	—	—	S S E	W b N	N W	N 78 W	12.0	28.5	12.7	13.43	16.62	...	...
15	.741	.831	.924	.8482	16.8	23.0	20.0	15.46	—14.02	.080	.058	.054	.061	85	47	78	71	S W b N	N N W	Calm.	N 26 W	9.6	12.8	0.0	7.10	7.13	...	...
16	.924	.893	.819	.8729	2.4	23.0	13.2	13.92	—15.83	.041	.058	.047	.052	83	47	60	64	Calm.	S W b W	Calm.	S 72 W	0.0	10.6	0.0	3.75	3.98	...	...
17	.785	.752	.654	.8008	6.3	24.4	13.2	15.28	—14.86	.046	.076	.066	.063	82	57	83	73	Calm.	W b S	W N W	W	0.0	11.0	2.0	5.73	5.88	...	...
18	.949	.922	.912	.9307	11.8	31.6	25.6	23.80	— 6.62	.063	.082	.104	.086	87	45	75	69	W N W	W b S	S W b W	S 77 W	7.2	15.8	4.2	5.66	5.95	...	...
19	.807	.636	.399	.5895	17.6	29.1	29.8	26.47	— 4.32	.088	.148	.154	.132	92	92	93	90	Calm.	S S E	E N E	N 67 E	0.0	3.5	5.2	3.66	4.70	...	1.2
20	.334	.412	.663	.4927	26.6	32.2	15.4	24.28	— 6.83	.134	.126	.059	.106	93	69	66	77	N	N N W	N N W	N 21 W	7.0	19.2	10.0	13.84	14.20	...	0.1
21	.999	30.017	—	—	1.7	16.1	—	—	—	.044	.068	—	—	91	76	—	—	N	N b W	N E b N	N 2 W	6.0	3.0	3.8	3.38	3.72	...	...
22	30.049	29.837	.618	.8123	17.2	24.8	27.3	24.18	— 7.05	.081	.085	.130	.103	85	63	94	77	E b S	E b S	E b S	S 76 E	4.6	19.0	12.6	12.92	13.21	...	2.0
23	29.646	.732	.740	.7110	21.9	33.1	29.8	28.82	— 3.37	.105	.145	.133	.128	89	76	80	81	N	S W	Calm.	N 58 W	12.5	12.0	0.0	4.05	5.89	...	...
24	.826	.932	.987	.9225	26.9	27.3	21.2	24.65	— 8.02	.128	.056	.079	.080	91	37	70	69	N W	N N W	Calm	N 17 W	10.6	7.8	0.0	3.65	3.93	...	...
25	30.027	.991	.849	.9268	16.5	32.9	29.8	27.77	— 5.17	.083	.103	.140	.109	90	54	84	71	N E b E	E	N E b E	N 78 E	2.0	9.0	7.4	7.63	8.08	...	...
26	29.592	.392	—	—	35.3	36.7	—	—	—	.198	.205	—	—	96	94	—	—	E N E	E b N	S W b W	N 78 E	10.5	7.6	2.4	2.70	6.04	0.215	...
27	.590	.629	.718	.6323	38.6	45.4	32.7	38.92	+ 5.23	.204	.179	.165	.182	86	59	88	78	W b S	S W b W	Calm.	S 81 W	6.6	2.2	0.0	2.24	3.69	...	...
28	.679	.594	—	—	24.9	38.1	—	—	—	.195	.195	—	—	96	85	—	—	E N E	E N E	E b N	N 71 E	5.0	17.2	11.9	12.84	13.02	...	...
29	.403	.378	.316	.3608	30.6	37.8	36.0	37.73	+ 3.25	.219	.217	.206	.214	90	65	97	04	N E	E b N	E N E	N 61 E	9.0	13.0	4.6	8.05	8.42	0.060	...
30	.197	.178	.302	.2365	36.3	41.7	38.6	38.85	+ 3.77	.202	.237	.208	.212	94	89	89	90	N	W b N	N W b	N 47 W	5.0	7.0	17.0	11.64	12.20	.110	...
31	.486	.606	.670	.5969	32.7	33.4	28.4	31.66	— 3.55	.166	.120	.105	.130	88	62	66	72	N W	N W b N	N N W	N 30 W	25.0	20.6	9.8	14.54	14.96	...	...
	29.6583	29.6436	29.6468	29.6496	18.30	27.80	22.61	23.06	— 6.91	.106	.107	.109	.103	88	66	83	78					6.20	11.38	6.12	...	8.03	.985	15.0

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MARCH, 1869.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....30.104 at 8 a.m. on 7th } Monthly range=
Lowest Barometer.....29.178 at 2 p.m. on 30th } 0.926 inches.

Self-registering Ther.
- Maximum Temperature .....46°8 on 27th } Monthly range=
- Minimum Temperature.....—5°4 on 5th } 52°.2
- Mean Maximum Temperature.....31°21 } Mean daily range=
- Mean Minimum Temperature .....15°73 } 15°.48
- Greatest daily range.....27°6 from a.m. to p.m. of 12th.
- Least daily range ..... 5°4 from a.m. to p.m. of 31st.

Warmest Day.....27th...Mean Temperature.....38°92 } Difference=33°.60
Coldest Day..... 4th...Mean Temperature..... 5°12 }

Maximum Radiation.
- Solar .....70°0 on 14th } Monthly range=
- Terrestrial.....—18°4 on 5th } 88°.4

Aurora observed on 5 nights, viz.:—8th, 11th, 13th, 17th and 31st.

Possible to see Aurora on 15 nights; impossible on 16 nights.

Snowing on 9 days; depth 15.0 inches; duration of fall 61.5 hours.

Raining on 3 days; depth 0.985 inches; duration of fall 32.0 hours.

Mean of Cloudiness=0.60.

Resultant Direction N. 52° W.; Resultant Velocity 2.86.

Mean Velocity 8.02 miles per hour.

Maximum Velocity 35.4 miles, from noon to 1 p.m. of 14th.

Most Windy day 14th; Mean Velocity 16.52 miles per hour.
Least Windy day 11th; Mean Velocity 1.71 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 11.71 miles per hour.
Least Windy hour mid't.; Mean Velocity 4.99 miles per hour.

Solar haloes observed on 3rd, 6th, 7th, 8th, 13th, 14th, 15th, 17th, 19th, 22nd and 25th.

Lunar haloes observed on 1st, 3rd, 20th, 23rd, 24th and 25th.

29th March. Robins seen.

COMPARATIVE TABLE FOR MARCH.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°					°		
1841	27.7	— 2.1	54.6	— 6.7	61.3	5	1.170	7	...	...	...	0.51 lbs
1842	35.8	+ 6.0	70.3	15.1	55.2	4	3.150	8	...	...	...	0.70
1843	21.3	— 8.5	39.9	— 2.5	42.4	2	0.625	18	25.7	...	...	1.18
1844	31.3	+ 1.5	50.8	9.6	41.2	8	2.470	8	14.0	...	...	0.57
1845	35.4	+ 5.6	62.7	6.6	56.1	5	Insp.	8	2.8	...	...	0.66
1846	33.1	+ 3.3	49.6	8.3	41.3	9	1.905	5	2.3	...	...	0.30
1847	26.2	— 3.6	43.9	5.6	38.3	5	0.850	6	4.2	...	...	0.41
1848	28.6	— 1.2	58.6	0.0	58.6	5	1.220	6	9.7	N 66 W	2.03	5.80mls
1849	33.5	+ 3.7	53.0	15.1	37.9	7	1.525	2	2.3	N 3 W	1.48	5.37
1850	29.8	0.0	46.5	7.2	39.3	2	0.745	7	11.2	N 52 W	2.62	7.62
1851	32.4	+ 2.6	59.3	12.0	47.3	3	0.770	9	8.8	N 21 W	1.93	7.65
1852	27.7	— 2.1	44.8	— 7.4	52.2	8	3.080	12	19.5	N 8 W	0.71	5.81
1853	30.6	+ 0.8	56.3	0.0	56.3	6	1.080	8	7.1	N 58 W	2.60	5.06
1854	30.7	+ 0.9	55.1	7.4	47.7	9	2.425	3	2.8	N 53 W	3.39	8.03
1855	28.5	— 1.3	49.4	— 2.9	52.3	5	1.485	11	18.1	N 88 W	4.76	9.95
1856	23.1	— 6.7	41.4	—14.0	55.4	0	0.000	12	16.2	N 71 W	7.68	11.39
1857	27.8	— 2.0	57.6	— 5.5	63.1	4	0.335	15	11.3	N 63 W	6.63	10.84
1858	28.4	— 1.4	55.4	— 5.5	60.9	10	0.917	6	0.2	N 58 W	5.45	8.56
1859	36.3	+ 6.5	54.2	9.8	44.4	15	4.054	8	1.0	N 64 W	1.96	10.39
1860	34.5	+ 4.7	67.0	12.8	54.2	5	0.852	11	2.4	N 64 W	7.61	12.41
1861	26.9	— 2.9	47.4	— 5.2	52.6	8	2.125	14	7.1	N 54 W	4.33	10.56
1862	28.8	— 1.0	43.2	8.0	35.2	8	2.560	11	18.5	N 12 W	2.50	9.38
1863	25.8	— 4.0	42.2	— 4.0	46.2	4	0.687	17	11.4	N 27 W	2.62	9.27
1864	29.1	— 0.7	50.2	3.0	47.2	9	1.620	12	3.7	N 53 W	2.29	8.41
1865	33.6	+ 3.8	55.6	— 3.5	59.1	10	3.050	12	18.9	N 61 W	2.16	8.80
1866	27.6	— 2.2	45.8	7.5	38.3	6	1.915	18	7.2	N 73 W	6.84	11.51
1867	26.6	— 3.2	46.8	3.0	43.8	6	0.617	14	33.4	N 34 W	2.12	8.52
1868	31.3	+ 1.5	59.0	—15.6	74.6	7	2.660	5	4.2	N 21 W	2.12	8.58
1869	25.1	— 6.7	46.8	— 5.4	52.2	3	0.985	9	15.0	N 52 W	2.86	8.02
Res'ts to 1868.	29.85	...	52.16	2.08	50.08	6.38	1.629	9.69	10.15	N 57 W	3.31	8.80
Excess for '69	— 6.79	...	— 5.36	— 7.48	+ 2.12	— 3.38	— 0.644	— 0.69	+ 4.85	...	...	— 0.78

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—APRIL, 1869.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in Inches.	Snow in Inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant	MEAN		
					°	°	°	°													°							
1	29.684	29.538	29.272	29.4863	24.1	29.8	29.8	27.13	— 8.47	.107	.102	.133	.110	82	62	80	74	N E b N	E	E	N 82 E	8.0	10.4	21.4	10.99	11.72	...	.3
2	.216	.315	.468	.3460	33.4	36.0	27.0	31.95	— 4.03	.163	.162	.129	.149	85	76	88	82	S W	S W b S	N W	N 68 W	6.4	11.8	11.8	8.26	10.05	...	insp.
3	.496	.512	.524	.5087	22.3	27.7	25.2	24.87	—11.50	.101	.099	.093	.096	85	64	68	72	W N W	N W b W	W b S	N 75 W	12.0	17.2	7.2	13.38	13.88	...	insp.
4	.425	.364	—	—	22.3	28.0	—	—	—	.100	.109	—	—	83	71	—	—	W	W	W N W	S 89 W	14.5	16.6	5.3	10.75	11.17	...	.1
5	.2 6	.143	.122	.1552	30.6	39.2	38.1	36.60	— 0.63	.152	.189	.187	.172	89	75	81	80	W S W	W	W	S 77 W	7.7	17.5	4.9	9.04	9.23	...	...
6	.129	.243	.366	.2525	34.9	40.3	29.1	35.25	— 2.25	.161	.166	.128	.126	79	41	78	62	S W b W	W	Calm	N 75 W	5.0	18.8	0.0	8.99	9.30	...	...
7	.302	.422	.429	.4127	29.1	42.8	35.0	36.67	— 1.23	.133	.101	.159	.132	83	35	76	63	Calm	W	S W	S 65 W	0.0	13.5	8.0	6.93	8.47	...	insp.
8	.482	.562	.635	.5668	30.9	37.0	32.0	33.32	— 4.97	.141	.116	.143	.136	81	53	79	72	N W b W	W N W	N N W	N 55 W	15.0	18.4	5.8	11.55	11.56	...	...
9	.639	.657	.740	.6852	28.4	39.6	31.6	33.37	— 5.39	.134	.107	.126	.124	86	43	70	67	N W b N	N W b W	N W	N 33 W	3.6	6.0	5.2	7.36	7.75	...	...
10	.786	.745	.724	.7518	30.6	40.3	31.3	34.37	— 4.67	.138	.091	.115	.115	80	35	65	60	N b W	N W b N	N b W	N 9 W	6.0	10.8	8.0	8.74	9.01	...	...
11	.692	.656	—	—	28.4	39.9	—	—	—	.134	.121	—	—	86	49	—	—	N	S b W	N b W	N 17 W	8.2	2.5	6.7	2.63	4.72	...	...
12	.632	.612	.631	.6230	30.9	39.9	33.8	34.68	— 5.12	.127	.121	.125	.131	73	49	65	66	N W b N	S E	N N W	N 23 W	8.2	3.5	6.0	4.81	6.61	...	.1
13	.628	.636	.708	.6630	31.3	40.7	31.3	34.60	— 5.58	.116	.076	.100	.099	65	29	56	51	N W	N N W	N N W	N 28 W	4.8	10.5	7.4	10.49	10.88	...	...
14	.766	.788	.867	.8180	29.8	45.4	36.7	38.26	— 2.37	.124	.075	.120	.108	75	24	55	51	N W b W	N W b W	W b N	N 60 W	8.4	11.2	6.8	5.67	6.76	...	...
15	.912	.834	.774	.8302	28.8	47.9	37.4	38.75	— 2.18	.129	.165	.170	.159	81	48	75	68	Calm	S S E	E N E	S 35 E	0.0	8.8	1.6	3.11	4.16	...	...
16	.728	.685	.359	.5390	36.0	59.4	48.2	48.65	+ 7.33	.180	.200	.169	.199	85	39	55	61	Calm	S S W	S S W	S 51 W	0.0	12.8	3.2	5.56	7.47	.240	...
17	.363	.427	.481	.4322	41.7	52.2	41.0	45.03	+ 3.33	.237	.284	.192	.230	89	73	75	77	W N W	W S W	N N W	N 89 W	18.0	9.8	8.6	9.56	11.36	insp.	...
18	.612	.554	—	—	35.0	41.7	—	—	—	.159	.183	—	—	76	69	—	—	W	E b N	E b N	N 71 E	0.4	2.2	13.3	9.25	9.62	1.490	...
19	.160	.174	.235	.2010	40.7	47.9	45.4	44.72	+ 2.28	.231	.288	.292	.272	91	56	96	92	E	E S E	E b N	N 78 E	11.8	6.8	11.0	6.19	6.96	insp.	...
20	.195	28.920	28.952	.0113	43.5	58.7	45.4	49.75	+ 6.93	.259	.442	.253	.321	92	90	83	88	E N E	E N E	S W	S 58 W	10.0	8.0	18.4	2.97	10.08	.635	...
21	.039	29.173	29.506	.2662	43.5	41.7	37.8	41.12	— 2.07	.204	.167	.138	.172	72	62	60	65	W	W b S	W b N	N 88 W	15.0	21.0	20.0	18.33	18.76	insp.	...
22	.762	.844	.880	.8395	37.1	48.6	39.9	42.58	— 0.97	.166	.221	.206	.196	75	64	84	71	W	S S W	N W b N	N 71 W	7.0	8.3	1.0	3.62	7.29	...	...
23	.862	.669	.532	.6752	40.3	45.3	39.6	42.03	— 1.92	.228	.207	.194	.206	91	68	79	77	E	E b N	N E b E	N 81 E	9.0	12.6	0.5	6.81	8.25	insp.	...
24	.601	.601	.659	.6217	41.4	56.2	42.1	47.70	+ 3.40	.221	.275	.127	.213	85	60	46	63	Calm	S W	N W	N 58 W	0.0	5.5	20.5	10.43	11.33	.010	...
25	.760	.772	—	—	39.2	55.1	—	—	—	.180	.145	—	—	75	33	—	—	N W	W	W S W	N 66 W	17.0	12.8	5.0	10.07	11.33	...	...
26	.651	.575	.570	.5995	45.4	70.2	51.1	66.95	+11.93	.198	.232	.246	.238	65	31	64	53	W S W	W b S	Calm	N 87 W	3.6	17.0	0.0	7.33	7.55	...	...
27	.604	.555	.551	.5627	50.8	49.3	42.8	49.32	+ 3.90	.233	.221	.250	.239	63	63	90	70	W b N	E b N	S W b S	N 84 E	1.2	4.8	2.0	2.19	3.22	.590	...
28	.551	.482	.419	.4757	45.0	58.7	52.2	51.67	+ 5.90	.269	.273	.265	.267	90	55	67	70	N N W	N E b N	N E	N 17 E	1.0	6.0	2.0	4.96	7.17	...	...
29	.489	.573	.661	.5895	41.4	44.6	38.8	41.37	— 4.73	.214	.180	.186	.183	81	61	79	71	N E b E	S E b S	N b W	N 32 E	9.4	9.0	6.2	3.42	7.03	...	...
30	.704	.674	.584	.6478	35.3	45.0	38.6	40.73	— 5.75	.119	.072	.106	.093	57	22	44	37	N b E	S b E	N E b N	S 79 E	5.4	4.2	3.6	3.13	4.73	...	...
M	29.5276	29.5100	29.5246	29.5216	35.66	45.55	37.76	40.05	— 1.04	.172	.176	.168	.173	80	54	71	68					7.22	10.62	7.35		8.91	2.965	0.5

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer . . . . . 29.912 at 6 a.m. on 15th.
Lowest Barometer . . . . . 28.896 at 4 p.m. on 20th. } Monthly range= 1.016 inches.

Self-registering Ther.

Maximum temperature . . . . 72°2 on 26th.
Minimum temperature . . . . 16°6 on 15th. } Monthly range=55°6

Mean maximum temperature . . 48°03
Mean minimum temperature . . 32°28 } Mean daily range=15°75

Greatest daily range . . . . . 32°4 from a.m. to p.m. of 15th.
Least daily range . . . . . 5°8 from a.m. to p.m. of 21st.

Warmest day . . . 26th...Mean temperature . . . 56°95
Coldest day . . . . 3rd ...Mean temperature . . . 24°87 } Difference=32°08.

Maximum Solar . . . . . 84°0 on 26th.
Radiation Terrestrial . . . . . 10°5 on 15th. } Monthly range=73.5

Aurora observed on 12 nights, viz.:—2nd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 13th, 15th and 29th.
Possible to see Aurora on 22 nights; impossible on 8 nights.
Snowing on 6 days; depth 0 5 inches, duration of fall 14.1 hours
Raining on 9 days; depth, 2.965 inches; duration of fall, 23.4 hours.
Mean of cloudiness=0.61.

Resultant direction, N. 45° W.; resultant velocity, 2.93.
Mean velocity, 8.91 miles per hour.
Maximum velocity, 26.4 miles, from 3 to 4 p.m of 21st.

Most windy day, 21st; mean velocity, 18.70 miles per hour.
Least windy day, 27th; mean velocity, 3.22 miles per hour.

Most windy hour, 8 a.m.; mean velocity, 11 58 miles per hour.
Least windy hour, 7 p.m.; mean velocity, 6.65 miles per hour.

Solar haloes recorded on 1st, 5th, 7th, 16th and 27th; Lunar halo on 26th.
Thunder storms on 18th, 20th and 27th, that on the 18th being the first of the season and accompanied by a heavy fall of rain. Fog on 15th and 18th.
April 8th, Blue Birds seen. 14th. Large flocks of Pigeons. 16th. Frogs first heard. 17th. Swallows seen. 30th. Yellow Woodpeckers seen.
A very grand display of aurora, occupying more or less the whole sky, took place on the night of the 15th, and continued from dusk till daylight on the following morning. Throughout the day and night a considerable magnetic disturbance was going on.

COMPARATIVE TABLE FOR APRIL.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1841	39.2	— 1.8	64.8	19.9	44.9	3	1.370	3	...	...	...	0.51 lbs.
1842	43.7	+ 2.7	89.8	20.1	69.7	8	3.740	2	...	...	...	0.57
1843	40.9	— 0.1	71.6	14.7	56.9	7	3.185	3	0.1	...	...	0.46
1844	47.5	+ 6.5	74.6	14.9	59.7	10	1.515	1	Inap	...	...	0.24
1845	42.1	+ 1.1	66.7	15.5	51.2	11	3.290	4	1.5	...	...	1.00
1846	44.0	+ 3.0	81.8	24.2	57.6	10	1.300	2	1.3	...	...	0.55
1847	39.2	— 1.8	65.1	9.3	55.8	8	2.870	2	4.0	...	...	0.59
1848	41.3	+ 0.3	66.1	22.7	42.4	5	1.455	1	0.5	N 77 W	1.46	4.89 miles.
1849	39.0	— 2.0	72.0	15.5	56.5	10	2.655	2	1.7	N 43 W	3.14	7.50
1850	37.9	— 3.1	65.7	18.0	47.7	7	4.720	2	1.1	N 39 W	1.12	7.64
1851	41.3	+ 0.3	69.3	25.8	33.5	11	2.295	3	1.2	N 14 E	2.52	8.07
1852	38.2	— 2.8	53.8	20.0	33.8	6	1.990	4	9.4	N 23 E	2.44	6.68
1853	41.9	+ 0.9	65.7	25.0	40.7	10	2.625	-	1.0	N 12 W	1.95	5.20
1854	41.0	0.0	64.5	20.2	44.3	12	2.685	4	2.7	N 50 E	2.57	6.81
1855	42.4	+ 1.4	69.4	10.7	58.7	8	2.030	3	1.6	N 36 W	3.99	7.57
1856	42.3	+ 1.3	72.2	14.2	58.0	13	2.780	3	0.1	N 29 E	1.64	6.05
1857	35.4	— 5.6	52.0	5.9	46.1	10	1.755	11	12.9	N 60 W	4.15	10.24
1858	41.5	+ 0.5	65.2	21.8	43.4	13	1.642	2	0.1	N 14 W	1.64	9.57
1859	39.5	— 1.5	64.8	22.6	42.2	9	2.625	8	1.2	N 36 W	2.33	10.79
1860	39.5	— 1.5	61.8	19.5	42.3	11	1.282	5	0.3	N 37 W	4.10	10.30
1861	42.0	+ 1.0	67.0	23.8	43.2	12	1.619	4	6.9	N 37 E	2.31	8.90
1862	39.6	— 1.4	68.0	14.5	53.5	10	2.235	4	0.2	N 50 E	2.48	9.77
1863	42.0	+ 1.0	69.0	8.6	60.4	8	2.210	4	1.4	N 14 E	3.75	9.20
1864	40.9	— 0.1	59.4	28.1	31.3	16	3.633	3	3.5	N 41 E	3.39	7.77
1865	43.1	+ 2.1	62.5	23.0	39.5	17	3.972	6	2.0	N 84 W	2.11	8.39
1866	43.9	+ 2.9	71.0	28.5	42.5	7	1.675	2	Inap	N 42 W	3.34	7.95
1867	39.5	— 1.5	65.5	25.4	40.1	12	2 147	5	7.2	N 51 W	2.68	7.89
1868	38.0	— 3.0	64.0	9.2	54.8	7	0.990	10	5.3	N 63 W	2.43	9.24
1869	40.1	— 0.9	72.2	16.6	55.6	9	2.965	6	0.5	N 45 W	2.93	8.91
Results to 1868	40.99	... ...	66.87	18.63	48.24	9.83	2.400	3.66	2.59	N 17 W	2.02	8.12
Exs. for 1869.	—0.91	.....	+5.33	—2.03	+7.30	— 0.83	+ 0.565	+ 2.34	— 2.09	...	...	+ 0.79

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MAY, 1869.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal	Tension of Vapour				Humidity of Air.				Direction of Wind			Resultt.	Velocity of Wind.					Rain in Inches.	Snow in Inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	M'N		6 A.M.	2 P.M.	10 P.M	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result.	M'N.		
1	29.427	29.279	29.208	29.2902	39.6	38.5	36.3	37.53	— 6.32	.125	.208	.193	.174	52	89	90	78	E N E	E b N	E N E	N 67 E	10.4	17.0	14.0	12.20	13.05	.810	inap.
2	.139	.194	—	—	35.6	45.4	—	—	—	.202	.225	—	—	97	74	—	—	N b E	N	N W	N 26 W	10.5	16.4	11.9	12.22	13.46	.100	...
3	.222	.269	.326	.2828	36.7	45.7	41.4	41.48	— 6.07	.129	.099	.136	.117	59	28	51	45	N W b W	N W	W b N	N 48 W	22.0	29.8	10.0	18 17	18.54	...	...
4	.443	.451	.540	.4832	37.1	52.9	43.9	44.92	— 2.98	.122	.137	.146	.136	55	33	50	46	N W b W	N W b N	N N W	N 29 W	13.0	22.2	14.5	15.04	15.31	...	...
5	.585	.620	.667	.6258	38.8	46.8	44.6	44.82	— 3.45	.152	.179	.217	.190	64	55	74	63	N N W	S E b S	N E	S 88 E	6.6	11.0	0.6	2 60	4.92	...	...
6	.698	.690	.674	.6880	45.0	53.3	48.2	49.50	+ 0.90	.211	.197	.207	.200	70	48	60	57	N E	S E b E	N	N 51 E	5.2	8.6	8.5	4.97	7.95	...	...
7	.700	.700	.713	.7055	49.0	56.5	50.8	52.08	+ 3.70	.187	.208	.182	.197	53	45	49	49	N N E	S S W	N	N 19 W	8.0	5.0	9.0	4.55	7.53	...	...
8	.765	.694	.645	.6908	43.9	57.2	52.9	52.92	+ 3.58	.172	.249	.318	.272	59	53	78	66	N b W	S b W	N W b N	S 78 W	7.6	8.2	8.4	0.84	3.49	Inap	...
9	.584	.628	—	—	46.4	58.7	—	—	—	.278	.285	—	—	88	57	—	—	Calm.	S	N	S 24 W	0.0	3.4	0.9	0.57	2.33	...	...
10	.576	.546	.473	.6202	48.6	55.8	50.4	52.13	+ 2.08	.211	.219	.227	.218	61	48	61	56	E N E	E b S	E N E	S 80 E	2.0	9.6	1.0	3.40	3.53	Inap.	...
11	.417	.331	.370	.3708	49.3	70.6	61.2	60.55	+10.15	.271	.338	.386	.318	77	44	71	61	Calm.	S W b S	Calm.	S 44 W	0.0	15.6	0.0	5.86	6.00	...	...
12	.375	.314	.294	.3167	54.0	72.0	49.7	58.62	+ 7.90	.357	.364	.317	.346	85	47	59	72	Calm.	S E b E	E	S 89 E	0.0	5.4	10.0	4.45	4.62	.040	...
13	.256	.061	.111	.1327	45.7	59.8	50.0	51.43	+ 0.33	.259	.348	.345	.317	84	67	96	84	N E b E	E N E	E b S	N 68 E	1.0	13.4	2.6	6.65	6.73	.020	...
14	.093	.055	.087	.0785	49.3	60.1	52.6	54.12	+ 2.68	.344	.389	.300	.343	98	74	75	82	N N E	S E b S	N E	S 57 E	0.6	4.5	0.6	1.47	2.50	Inap.	...
15	.087	.123	.147	.1207	47.9	55.5	49.0	51.57	— 0.22	.332	.305	.307	.317	99	69	88	83	W b S	W	Calm.	West.	0.6	12.0	0.0	2.46	4.08	Inap	...
16	.103	.101	—	—	49.0	51.5	—	—	—	.287	.325	—	—	82	85	—	—	N E b N	S S W	W b N	N 75 W	2.0	9.8	15.9	9.52	11.09	.720	...
17	.307	.391	.493	.4080	43.5	48.9	41.4	44.87	— 7.62	.231	.230	.221	.231	82	67	85	78	W	W N W	Calm.	N 73 W	8.2	22.0	0.0	9.74	9.83	Inap.	...
18	.523	.520	.523	.5272	40.7	47.2	47.1	45.63	— 7.18	.204	.249	.221	.225	80	76	68	73	W b N	Calm.	N W b N	N 36 W	8.0	0.0	8.5	4.07	4.38	...	...
19	.483	.456	.497	.4833	43.5	48.2	47.5	47.20	— 5.97	.223	.297	.216	.246	78	88	65	75	N N W	S W	N N W	N 29 W	5.0	1.0	13.5	6.74	6.87	Inap.	...
20	.594	.613	.653	.6227	45.3	54.7	45.4	49.23	— 4.30	.228	.283	.135	.216	75	66	44	60	N W	S W	N N W	N 40 W	8.5	4.9	4.7	4.38	5.7	...	...
21	.605	.587	.547	.5945	40.3	50.4	45.4	45.97	— 7.90	.176	.208	.153	.178	69	56	49	57	N b E	S b E	N W b N	N 23 W	3.8	5.4	7.0	1.88	5.55	...	...
22	.529	.497	.550	.5270	46.4	56.6	47.0	51.05	— 3.15	.184	.193	.157	.165	58	40	46	44	N N W	S b W	N W b N	N 40 W	8.4	7.0	2.6	5.23	6.76	...	...
23	.537	.530	—	—	47.1	67.4	—	—	—	.203	.431	—	—	62	63	—	—	W	S S W	Calm.	S 32 W	2.0	6.6	0.0	1.65	1.78	...	...
24	.554	.538	.536	.5423	47.5	67.0	55.8	56.10	+ 3.20	.296	.383	.355	.344	90	57	80	72	Calm.	S S W	W S W	S 24 W	0.0	10.0	1.2	4.29	4.35	...	...
25	.540	.454	.380	.4587	52.2	69.9	60.1	62.85	+ 7.02	.327	.384	.354	.372	83	52	67	65	Calm.	S	Calm.	S 50 W	0.0	8.0	0.0	3.78	5.56	.240	...
26	.387	.499	.684	.5362	58.0	52.2	48.6	53.53	— 2.03	.394	.281	.261	.321	82	73	77	76	S W b W	N b W	N N E	N 4 W	2.8	15.0	6.2	7.07	8.02	.016	...
27	.803	.788	.772	.7847	44.1	48.6	48.2	48.10	— 7.80	.178	.155	.170	.174	61	44	50	52	N E b N	E	N E b N	N 80 E	6.5	7.8	1.6	5.79	6.08	...	...
28	.667	.560	.514	.5750	50.8	47.9	48.2	49.08	— 7.13	.230	.301	.307	.238	62	90	91	83	E b N	E b N	E N E	N 73 E	7.0	10.5	10.2	7.53	7.83	.320	...
29	.574	.667	.676	.6400	50.4	57.2	49.0	53.28	— 3.27	.340	.370	.266	.337	93	79	77	82	N N W	S W b S	Calm.	N 83 W	0.5	1.6	0.0	0.66	1.40	...	...
30	.634	.621	—	—	49.3	56.5	—	—	—	.344	.356	—	—	98	78	—	—	N E	E S E	Calm.	S 81 E	2.4	5.6	0.0	2.97	3.12	.020	...
31	.543	.488	.521	.5258	49.7	67.0	59.1	58.88	— 1.72	.338	.553	.490	.476	95	83	98	94	Calm.	S b W	Calm.	S 31 W	0.0	2.6	0.0	0.45	0.56	.420	...
	29.4923	29.4690	29.4846	29.4820	46.05	55.00	49.03	50.77	— 1.32	.239	.274	.253	.258	74	60	70	67	.....	.....	.....	.....	4.92	9.65	5.24	.....	6.55	2.805'	Inap.

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MAY, 1868.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.803 at 8 a.m. on 27th. } Monthly range—
Lowest Barometer.....29.054 at 4 p.m. on 14th. } 0.749.

Solar Registering Ther.
- Maximum Temperature .....74°2 on 11th. } Monthly range—
- Minimum Temperature .....31°4 on 2nd. } 42°8.
- Mean Maximum Temperature .....68°83. } Mean daily range—
- Mean Minimum Temperature .....42°76. } 16°08.
- Greatest daily range.....30°4 from a.m. to p.m. of 11th.
- Least daily range ..... 4°6 from a.m. to p.m. of 1st.

Warmest day.....25th...Mean Temperature.....62°85. } Difference—25°32.
Coldest day ..... 1st...Mean Temperature.....37°53. }

Maximum Radiation. { Solar .....89°8 on 11th. } Monthly range—
{ Terrestrial ... .25°4 on 4th. } 64°4.

Aurora observed on 4 nights, viz.: 3rd, 4th, 7th, and 9th.
Possible to see Aurora on 15 nights; impossible on 16 nights.
Snow on 1 day; depth inapp.; duration of fall inapp.
Raining on 16 days; depth 2.805 inches; duration of fall 67.4 hours.
Mean of Cloudiness=0.67.

Resultant Direction N. 20° W.; Resultant Velocity 2.38.
Mean Velocity 0.65 miles per hour.
Maximum Velocity 30.0 miles, from noon to 1 p.m. of 4th.

Most Windy day 3rd; Mean Velocity 18.54 miles per hour.
Least Windy day 31st; Mean Velocity 0.58 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 9.55 miles per hour.
Least Windy hour 4 a.m.; Mean Velocity 3.73 miles per hour.

May 1st, last snow of season.
3rd, last recorded ice of season.
18th, sharp frost.

Thunder or lightning recorded on 5 occasions.

Dew on 11 mornings.

Solar haloes on 6th, 12th, 14th, 27th and 30th.

COMPARATIVE TABLE FOR MAY.

YEAR.	TEMPERATURE. Mean.	Excess above average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant Direction.	Resultant Vel'y	Mean Velocity.
	°	°	°	°	°							
1841	50.5	— 0.9	78.0	26.5	51.5	11	2.350	1	...	...	...	0.35 lbs
1842	49.1	— 2.3	74.8	27.3	47.5	7	1.275	0	0.0	...	...	0.53
1843	49.1	— 2.3	79.8	29.2	50.6	5	1.570	0	0.0	...	...	0.52
1844	53.6	+ 2.2	78.4	28.7	49.7	14	5.070	0	0.0	...	...	0.30
1845	49.6	— 1.8	77.8	27.8	50.0	8	2.300	0	0.0	...	...	0.55
1846	55.5	+ 4.1	79.7	33.1	46.6	9	4.375	0	0.0	...	...	0.46
1847	54.4	+ 3.0	72.1	26.7	45.4	12	2.040	0	0.0	...	...	0.29
1848	54.1	+ 2.7	78.0	31.3	46.7	13	2.520	0	0.0	N 40 W	1.31	4.93 m.
1849	48.0	+ 3.4	72.2	27.9	44.3	16	5.115	0	0.0	N 51 E	1.97	5.33
1850	47.6	— 3.8	77.8	27.5	50.3	17	0.545	1	inap.	N 64 W	2.05	6.32
1851	51.3	— 0.1	73.3	24.0	45.3	12	2.950	1	0.5	N 32 W	1.59	6.31
1852	51.4	0.0	73.3	32.0	41.3	7	1.125	1	inap	S 82 W	0.09	4.00
1853	50.9	— 0.5	78.4	32.2	46.2	17	4.420	1	inap	N 2 W	0.83	5.16
1854	52.2	+ 0.8	71.4	25.2	46.2	11	4.030	0	0.0	E	0.40	5.38
1855	53.1	+ 1.7	77.5	35.0	44.5	6	2.505	2	0.9	N 1 W	2.76	5.93
1856	50.5	— 0.9	82.2	31.2	51.0	14	4.580	1	inap	N 4 E	3.99	9.81
1857	48.9	— 2.5	74.8	23.0	48.8	15	4.145	1	inap	N 23 W	1.14	8.13
1858	48.9	— 2.5	69.8	31.0	38.8	17	6.367	0	0.0	N 42 E	3.33	9.30
1859	55.2	+ 3.8	79.6	39.5	40.1	11	3.410	0	0.0	N 72 E	1.59	5.70
1860	55.5	+ 4.1	74.5	32.5	42.0	16	1.815	0	0.0	N 26 E	2.66	7.17
1861	47.5	— 3.9	73.0	28.0	45.0	12	3.380	1	0.5	N 47 W	3.09	9.17
1862	52.2	+ 0.8	78.5	32.4	46.1	8	1.427	0	0.0	N 52 W	2.80	7.87
1863	54.3	+ 2.9	79.0	36.4	42.6	14	3.363	1	0.1	N 56 E	0.41	5.89
1864	54.8	+ 3.4	79.0	32.2	46.8	18	4.070	0	0.0	N 7 W	1.86	5.64
1865	52.3	+ 0.9	79.0	30.0	49.0	11	4.005	0	0.0	N 3 W	1.65	5.48
1866	48.3	— 3.1	73.4	35.4	40.0	13	2.820	0	0.0	N 46 W	4.49	9.26
1867	46.5	— 4.9	65.0	24.6	40.4	18	3.220	1	inap.	N 51 W	3.55	8.40
1868	51.8	+ 0.4	75.0	33.2	39.8	16	7.670	0	0.0	N 38 E	3.16	6.87
1869	50.8	+ 0.6	74.2	13.4	42.8	16	2.805	1	inap.	N 20 W	2.38	6.55
Results to 1869	51.44	...	76.19	30.24	45.95	11.97	3.375	0.41	0.08	N 11 W	1.66	6.77
	—		—	—	—	+	—	+	—			—
Excess for 1868	0.64	...	1.99	1.16	3.16	4.03	0.670	0.59	0.08	...	...	0.22

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—JUNE, 1869.

Latitude—43° 39′4 *North.* *Longitude*—5h. 17m. 33s. *West* *Elevation above Lake Ontario, 108 feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	M'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	M'AN		
1	29.614	29.677	29.717	29.6733	59.4	69.5	56.8	62.05	+ 2.55	.473	.606	.413	.455	93	70	90	82	Calm.	S by W	Calm.	S 28 W	0.0	5.2	0.0	2.85	3.06	...	...
2	.761	.759	.701	* .7598	54.4	69.6	56.2	60.50	+ 2.70	.396	.532	.291	.430	93	74	87	83	Calm.	Calm	Calm.	S 25 E	0.0	0.0	0.0	0.0	0.39	0.47	...
3	.816	.731	.659	.7258	52.9	73.8	56.9	62.42	+ 4.28	.372	.502	.362	.419	92	60	78	75	Calm.	S	E S E	S 10 E	0.0	3.2	0.4	0.97	1.35	...	...
4	.597	.476	.376	.4662	58.7	66.3	60.9	61.12	+ 2.05	.384	.609	.503	.452	78	78	94	84	Calm.	Calm.	N by E	N 5 W	0.0	0.0	9.8	2.65	4.48	0.890	...
5	.305	.420	.660	.4833	55.6	55.4	45.4	51.82	— 6.94	.392	.327	.216	.304	89	74	70	76	N N W	N W by N	W N W	N 41 W	11.8	23.2	15.6	11.07	11.31	.075	...
6	.802	.857	—	42.1	54.4	—	—	—	—	.213	.308	—	—	79	73	—	—	W by N	S W by S	N by E	N 29 W	0.5	4.0	4.9	0.26	2.69	[trace]	...
7	.939	.845	.776	.8447	42.1	67.6	50.0	50.40	— 9.00	.195	.276	.204	.263	72	58	84	72	Calm.	S by E	Calm.	S 65 W	0.0	11.4	0.0	1.85	5.35	.175	...
8	.814	.910	.930	.8935	45.7	58.9	49.9	51.91	— 8.67	.249	.307	.263	.276	81	66	76	73	N W by	Calm.	Calm.	N 19 W	10.0	0.0	0.0	1.71	2.80	...	...
9	.931	.851	.625	.8049	47.2	56.2	51.1	52.75	— 7.28	.279	.263	.278	.279	86	68	74	71	Calm.	E	E	S 85 E	0.0	16.2	9.0	8.07	8.05	.456	...
10	.487	.510	.610	.4917	50.0	66.3	62.2	55.76	— 4.62	.346	.410	.337	.370	96	64	86	83	E	W by S	N W by	N 86 W	3.0	9.2	15.0	4.50	5.93	.376	...
11	.467	.440	.460	.4513	50.4	62.9	47.9	50.63	— 10.07	.318	.266	.250	.256	86	65	74	69	W S W	W N W	W	N 73 W	2.2	12.5	3.0	9.54	9.77	...	...
12	.503	.466	.402	.4527	46.1	58.3	52.2	52.93	— 8.07	.225	.290	.348	.288	72	69	89	72	N W by	S E	E	S 73 W	7.5	2.0	4.5	1.53	3.35	[trace]	...
13	.267	.135	—	54.7	59.0	—	—	—	—	.358	.428	—	—	84	86	—	—	E	S	S W by S	S 21 W	2.8	3.2	8.5	0.55	7.06	.050	...
14	.088	.074	.102	.1148	55.8	61.6	54.4	57.80	— 3.87	.392	.348	.346	.355	89	63	81	75	S S W	S W by S	S W	S 40 W	9.6	17.2	4.2	5.54	8.93	...	...
15	.220	.303	.424	.3257	55.5	62.9	50.0	52.15	— 9.83	.314	.306	.304	.308	71	76	84	79	S W	W	S W	N 82 W	3.5	6.2	2.0	4.76	4.92	.060	...
16	.495	.537	.627	.5632	51.1	62.3	51.1	55.73	— 6.57	.320	.259	.246	.284	85	46	65	65	Calm.	W N W	Calm.	N 74 W	0.0	16.0	0.0	6.65	7.05	.033	...
17	.756	.747	.684	.7282	52.2	66.6	56.2	59.42	— 3.18	.305	.338	.295	.314	78	52	65	65	Calm.	S E	N E by E	S 50 E	0.0	2.2	0.8	2.49	3.33	.010	...
18	.593	.480	.627	.5675	53.3	68.0	59.8	62.83	— 0.08	.301	.500	.392	.408	74	73	76	71	E by N	Calm.	N W by	N 54 W	7.0	0.0	6.0	3.31	5.29	...	...
19	.731	.754	.662	.7103	58.3	63.7	57.6	59.87	— 3.33	.300	.428	.410	.415	80	72	86	81	N N W	S	N E by E	N 81 E	3.0	7.2	4.0	1.98	4.88	.375	...
20	.430	.384	—	—	52.9	75.3	—	—	—	.381	.570	—	—	95	65	—	—	S by W	W by N	N W by N	N 52 W	4.0	21.6	2.9	5.21	6.87	.050	...
21	.516	.500	.474	.4895	60.1	67.4	59.4	62.65	— 1.12	.464	.379	.434	.431	93	56	86	77	N E	E by S	Calm.	S 61 E	1.0	0.0	0.0	2.17	2.31	.005	...
22	.466	.453	.438	.4183	58.7	69.9	58.7	62.02	— 1.18	.419	.516	.339	.423	85	70	68	73	Calm.	S by E	S W by S	S 8 W	0.0	11.4	4.5	3.88	4.62	.075	...
23	.414	.548	.628	.5373	60.6	67.7	66.5	63.02	— 1.37	.458	.313	.378	.371	87	45	83	66	S W by	W	Calm.	S 88 W	6.2	12.4	0.0	7.14	7.92	...	...
24	.633	.646	.711	.6830	56.5	66.6	60.4	60.90	— 3.72	.313	.378	.386	.350	68	68	76	65	N N E	S W	N	S 87 W	1.2	6.6	8.2	3.78	6.13	[trace]	...
25	.833	.823	.787	.8197	51.1	63.7	52.6	55.81	— 9.03	.240	.339	.310	.299	65	67	78	67	N W by N	S	N N E	S 47 E	0.8	5.0	1.2	0.43	3.15	...	...
26	.750	.707	.634	.6907	55.1	60.5	54.7	56.77	— 8.31	.331	.271	.237	.308	76	60	78	67	Calm.	Calm.	Calm.	N 69 E	0.0	0.0	0.0	1.57	2.23	.025	...
27	.573	.550	—	—	53.3	57.3	—	—	—	.387	.425	—	—	95	90	—	—	Calm.	S E by E	E N E	S 68 E	0.0	4.0	2.4	1.63	2.19	.090	...
28	.358	.417	.566	.4518	57.2	74.6	62.3	65.78	+ 0.13	.404	.521	.395	.455	86	60	70	72	Calm.	N W by N	Calm.	N 58 W	0.0	19.4	0.0	5.27	6.52	[trace]	...
29	.590	.574	.457	.5390	62.3	74.2	64.8	67.10	+ 1.23	.510	.627	.582	.572	90	76	95	86	S W by	S S W	S W by	S 57 W	0.6	9.2	4.0	3.95	5.08	.125	...
30	.462	.503	.634	.5399	64.6	71.3	58.0	64.65	— 1.52	.560	.443	.314	.439	92	57	65	71	N N W	N	N N W	N 13 W	5.6	12.7	9.2	9.03	9.21	.010	...
	29.5859	29.5827	29.5934	29.5868	54.31	64.37	55.15	58.42	— 3.59	.360	.391	.351	.367	83	63	79	74	.....	.....	.....	.....	2.76	8.22	3.98	...	5.23	1.373	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JUNE, 1869.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer . . . . . 29.082 at 8 a. m. on 9th.
Lowest Barometer . . . . . 29.074 at 2 p. m. on 14th. } Monthly range—0.008.

Self-registering Ther.:
- Maximum temperature . . . . . 81°4 on 29th.
- Minimum temperature . . . . . 36°4 on 6th. } Monthly range—45°0
- Mean maximum temperature . . . . . 67°37
- Mean minimum temperature . . . . . 50°04 } Mean daily range—17°33
- Greatest daily range . . . . . 28°6 from a.m. to p.m. of 18th.
- Least daily range . . . . . 4°8 from a.m. to p.m. of 5th.

Warmest day . . . . 29th...Mean temperature . . . 67°10
Coldest day . . . . 7th...Mean temperature . . . 50°40 } Difference—16°70.

Maximum { Solar . . . . . 97°0 on 22nd
Radiation { Terrestrial . . . . . 25°2 on 6th } Monthly range—71°8

Aurora observed on 3 nights, viz.: 5th, 7th, and 11th.

Possible to see aurora on 11 nights; impossible on 19 nights.

Raining on 22 days; depth, 4.373 inches; duration of fall, 83.5 hours.

Mean of cloudiness—0.67.

Resultant direction, N. 80° W.; Resultant velocity, 1.77.

Mean velocity, 5.23 miles per hour.

Maximum velocity, 25.5 miles, from 3 to 4 p.m. of 5th.

Most windy day, 5th; mean velocity, 11.31 miles per hour.

Least windy day, 2nd; mean velocity, 0.47 miles per hour.

Most windy hour, 3 p.m.; mean velocity, 8.88 miles per hour.

Least windy hour, 6 p.m.; mean velocity, 2.79 miles per hour.

10th. Thunder storm.
27th. Thunder storm.
29th. Thunder storm.
6th. Hoar frost.

Fog recorded on 7 occasions. Dew on 10 mornings.

COMPARATIVE TABLE FOR JUNE.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°		°	°	°							
1841	65.6	+ 4.1	93.1	45.3	47.8	9	1.560	...	...	...	...	0.36 lbs
1842	55.6	— 5.9	80.2	28.1	52.1	15	5.755	...	...	...	...	0.71
1843	58.4	— 3.1	83.3	28.2	55.1	12	4.695	...	...	...	...	0.27
1844	59.9	— 1.6	83.3	33.2	50.1	9	3.535	...	...	...	...	0.19
1845	61.0	— 0.5	84.6	38.6	46.1	11	3.715	..	...	...	...	0.27
1846	63.3	+ 1.8	84.2	39.1	45.1	10	1.920	...	...	...	...	0.32
1847	58.4	— 3.1	77.8	36.7	41.1	14	2.625	..	...	...	...	0.30
1848	62.9	+ 1.4	92.0	37.4	54.6	8	1.810	...	...	N 61 W	1.20	4.51 m.
1849	63.2	+ 1.7	81.4	35.2	49.2	7	2.020	...	...	S 71 E	0.49	3.32
1850	64.3	+ 2.8	85.6	34.2	51.4	10	3.345	...	...	S 60 W	0.38	4.54
1851	59.2	— 2.3	79.2	37.0	42.2	11	2.695	...	...	S 2 W	1.26	4.42
1852	60.8	— 0.7	86.1	37.2	48.9	10	3.160	...	...	S 76 W	1.49	4.03
1853	65.5	+ 4.0	89.5	39.2	50.3	9	1.550	...	...	N 1 W	0.16	3.73
1854	64.1	+ 2.6	92.5	35.2	57.3	9	1.460	...	...	N 24 E	0.71	4.15
1855	59.9	— 1.6	91.5	36.2	55.3	17	4.070	...	...	N 69 W	1.33	5.70
1856	62.1	+ 0.6	89.2	42.0	47.2	13	3.200	...	...	S 21 W	0.90	5.30
1857	56.9	— 4.6	76.0	35.0	41.0	21	5.060	...	...	N 49 W	1.15	7.60
1858	66.2	+ 4.7	90.2	42.5	47.7	12	2.943	...	...	S 20 E	0.25	5.53
1859	58.3	— 3.2	86.4	32.2	54.2	16	4.085	2	Inap	N 77 E	1.95	7.19
1860	63.2	+ 1.7	81.6	49.2	32.4	14	2.136	...	...	N 44 W	3.13	7.61
1861	61.3	— 0.2	87.8	41.6	46.2	13	2.329	...	...	N 39 W	2.29	6.11
1862	60.5	— 1.0	85.4	39.4	46.0	10	1.007	...	...	N 26 W	1.77	5.98
1863	60.1	— 1.4	84.8	37.4	47.4	13	1.662	...	...	N 50 W	2.26	5.24
1864	63.0	+ 1.5	93.4	34.8	58.6	5	0.570	...	...	N 65 W	1.72	4.53
1865	64.5	+ 3.0	90.2	43.0	47.2	7	2.005	...	...	S 30 W	0.60	4.06
1866	60.2	— 1.3	90.5	40.0	50.5	16	2.720	...	...	S 15 W	0.71	5.09
1867	64.3	+ 2.8	88.6	44.0	44.6	8	0.885	...	...	S 84 E	0.48	4.13
1868	62.0	+ 0.5	84.2	38.0	46.2	11	2.217	...	...	N 16 E	0.85	5.26
1869	58.4	— 3.1	81.4	36.4	45.0	22	4.373	...	...	N 80 W	1.77	5.23
Results to 1868	61.53	.....	86.27	37.85	48.42	11.38	2.741	...	...	N 61 W	0.77	5.16
Excess for 1869	—3.11	.....	—4.87	—1.45	—3.42	+10.62	+1.632	...	...	...	...	+0.08

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