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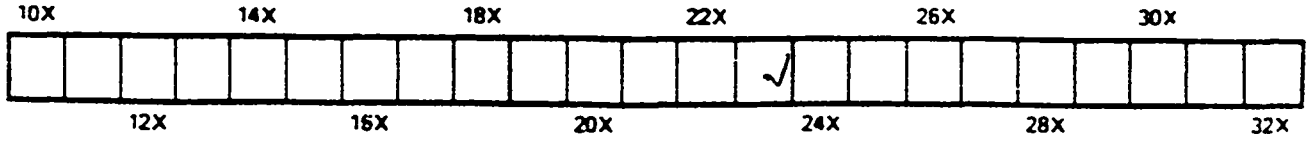

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THE CANADIAN JOURNAL.

NEW SERIES.

No. LXXVIII.—MAY, 1873.

MERTON COLLEGE AND CANADA.

BY HENRY SCADDING, D.D.

Read before the Canadian Institute, January 11, 1873, as the President's Address for the Session 1872-3.

During my stay for some weeks at Oxford, a few years since, I was led to take a peculiar interest in Merton College, in that University; and had circumstances rendered it in any way advisable for me to become an incorporated member of the University, I should certainly have asked to have my name entered on the boards of Merton. As it was, the minor privilege of *admissio comitatis causâ* sufficed for every purpose I had in view, and *that* did not require the selection of a college as a quasi-home or house, but gave, during the remainder of life, whenever resident in Oxford, without any such limitation, all the advantages of degree and rank, the franchise alone excepted, which my position in the sister University of Cambridge could claim for me there. And I cannot refrain from confessing that even the semblance of affiliation with ancient and venerable Oxford which a mere *admissio comitatis causâ* creates—formally conferred by the Vice-Chancellor in the Convocation-house, and duly enregistered, and printed in the Calendar of the day—was vastly enjoyed by me as a small incident of romance occurring unexpectedly in one's experience. But more than this, the positive benefits accruing from the privilege were found to be of very great value. Besides giving the right and the pleasure on any occasion of assuming in the

University the academic dress, it secured a fixed place in public assemblages, and opened the way with extra facility to libraries and museums, as well as to the lecture-rooms, in several instances, of professors of preëminent ability and world-wide fame. And, as I have said, the boon is good for the remainder of one's days.

I need not say, I endeavoured to avail myself to the utmost of the rich and varied privileges with which, for a period all too brief, I found myself surrounded.

In respect of area covered by buildings and in regard to external grandeur, Merton College cannot compare with Christ Church, All Souls, New College, Balliol, and perhaps other Colleges in the University of Oxford. But no College in the University matches Merton in severe venerableness of aspect, or in the extent, I think, to which, in its general outline, it has retained unaltered the visible embodiment of the ideas of its several very early architects.

Its entrance gateway, bearing the statues of Henry III. and Walter de Merton, founder of the College; the two diminutive courts or quadrangles first traversed inside; the low vaulted passage leading from one to the other of them; the east window of the chapel and the massive square tower seen just beyond the gable; the steep slopes of the Treasury-roof, made fireproof by plates of rough ashlar instead of slate; finally, the quaint lights of the Library along the walls, and rising above the eaves of the roof on the south and west sides of the third court; all at first sight stir the imagination very strongly and stamp themselves indelibly on the memory.

Of the Library just named—its internal air and aspect—I desire especially to speak to you for a moment, such a surprise and delight was it to myself when I first entered it, either from not having been previously aware of its existence, or else from never having fallen in with any striking description of it.

It is supposed to be at the present day the most genuine ancient library in the British Islands. Its shelves and books look as if they had not been meddled with for several centuries. The wood of the book-cases has a pale weather-worn hue. The covers of the volumes are almost all of them of vellum or forel, with the names of the authors or matters treated of in them inscribed with a pen on the back, or on the outer edge of the leaves when the book is turned on the shelf with its back inward and clasps outward. Some of the volumes are still attached by chains to the bookcases, with the con-

trivance of a small pole or rod for the shifting of the volumes some distance to the right or left along a slope for its reception when open, while in front of the slope a rude bench is fixed for the accommodation of readers.

The ponderous balustrades of the staircase leading up to the Library, the amount of timber, or lumber as we should say, in the heavy tables and stools placed here and there, the floor, the roof, the plank employed in the carpentry of the cases and closets, all indicate a period when wood was plentiful in the land.

I expected to read in Antony à Wood an enthusiastic account of Merton Library, but I was disappointed to find that he spoke of it with no especial warmth. It may be that in his day, the libraries of the other Colleges of the University all wore an aspect so like that of Merton that, in his view, it possessed no peculiarity. He chiefly bemoans certain plunderings that had taken place therein at the period of the Reformation, and previously.

However, after all, the internal arrangements of Merton Library are late as compared with the date of the foundation of the College. Notwithstanding the very quaint and antique look of everything about it, most of the fittings, we are told, are of the time of James the First. One would scarcely have imagined this, at first sight: although, as we remember, two high, thinnish, wooden arches, somewhat of a triumphal character, near the head of the staircase, forming an entrance, one of them to the north wing, the other to the east wing of the Library, exhibited a style which was post-mediæval.

But this nevertheless is certain, that the two spacious rooms which now shelter the collection of books at Merton are the apartments designed and built in 1376, by Bishop Rede, of Chichester, one hundred and twelve years after the foundation of the College; and that many of the volumes still to be seen here, in manuscript, of course, are portions of the library presented to the College by the same bishop, who had been a fellow there; and it may be perhaps portions of the library of Walter de Merton himself. For it is implied in the Statutes given to the College by Walter De Merton, in 1270, that books were to be had within the walls of the building. He orders, for example, that the *Grammaticus* of the house, the Master of Grammar resident in the College, should have *librorum copia*, a plentiful supply of books for his purposes, as well as *alia sibi necessaria*. And for the reader at meal-time, he directs that

there shall be provided *aliquid quod ad scholarium instructionem et edificationem pertineat,* something that might tend to instruct and edify the scholars.

Before the construction of the Library by Bishop Rede, the books of the College would be kept in chests. Such was the custom then and later. Antony à Wood speaks of the *cistæ olim in Bibliothecâ Mertonensi repositæ,* filled with Mathematical and Astronomical works by members of the College; books, he says, *quos barbara superiorum seculorum pietas, tanquam Artis Magicæ proseminatores, reique proptereà Christianæ damnosos, execrari non destitit.* (In the same place he speaks of the loss out of the Library, from the same cause, of the *instrumenta Mathematica, qualia sunt Astrolabia, radii, quadrantes, &c., denique integrum clarissimæ Scientiæ Armamentarium.*)

Walter de Merton was born soon after 1200, and died Oct. 27, 1277. He was twice Lord High Chancellor of England: first in 1258, under Henry III.; and again in 1272, for a short time, under Edward I.; in 1274 he was made Bishop of Rochester, occupying the See only three years. A portrait of him exists in the Bodleian Library, and has been copied in Ackermann's History of Oxford. It shews a countenance of a cast modern, rather than mediæval; refined, thoughtful and intelligent; the hair and eyebrows snowy white.

As a preliminary to the foundation of his College in Oxford, he established at Malden, in Surrey, a *Domus Scholarium de Merton,* an institution which in addition to educational and other work at Maldon was, in accordance with rules laid down by himself, to supply means out of its endowments for the sustenance of twenty scholars frequenting the Schools at Oxford, or anywhere else where learning for the time being might be flourishing. Then after the lapse of six years, in 1270, the *Domus Scholarium de Merton,* intended to aid in the sustenance of scholars at Oxford, is removed to that place; and a reason is implied why it was not in the first instance established there. The date 1264 is spoken of as *tempus turbationis in regno Angliæ subortæ,* an unsettled time,—as indeed it was, the struggle of the Barons with the King still going on. But now, 1270 is described as a period of peace (*nunc tempore pacis*); and therefore the *Domus Scholarium de Merton* is removed to Oxford, where the founder had desired and intended it to be. A power of removal, however, to any other locality, should circumstances so

require, was still given to the Society,—in anticipation probably of troublous times occurring again.

Nine years ago,—viz: in 1864, the memorable year of the Shakspeare Tercentenary,—the members of Merton College celebrated, on the 14th of June, the Sexcentenary of the foundation of their Society. How many regions are there outside of happy England in which Societies, literary, political, or otherwise, can shew a continuous corporate existence of six hundred years?

Three hundred years before the birth of Shakspeare, the *Domus Scholarium de Merton* existed, in embryo at least, at Oxford. When the poet rambled about Oxford, as we know he did, in his journeyings between London and Stratford, and looked in at the gateways of the several Colleges, as any inquisitive stranger would do at the present day, he would, in point of antiquity, regard Merton College, the identical Merton College which we see now, as *we* should regard a building or institution founded in the middle of the reign of Elizabeth. In Shakspeare's time, the days of the king who followed next after John would seem tolerably remote, but easily grasped and reproduced with a vivid reality by such a mind as Shakspeare's, as we can see in his tragedy of King John.

But the chief point of interest about Merton College is not the antiquity of the Society of which it is the home. The great distinction of the College is this: that it was the first embodiment in Europe of a new system of training for the youth of a country—the system which has, by successive steps, developed into what is known as the English College or University system, which among the educational systems of Europe continues to be unique.

Walter de Merton is held to have been an enlightened innovator in respect of education. When he lived, what are technically called "Universities" had been instituted at different points on the continent of Europe for about fifty or eighty years (reckoning from the time of Abelard's lectures in Paris). They were incorporations of scholars and teachers, privileged by emperors, kings or popes, with peculiar jurisdiction in the towns where they were respectively situated; which towns, as a rule, became the centres of great disorder. Young people flocked in thousands to attend the lectures of this teacher and that. In this way Oxford was thronged. In the meantime, discipline was feebly maintained. Brawls and fights (battles they might even be called in some cases) were the order of

the day. The town came into collision with the gown; Welshmen, Scotchmen, North-of-England men, with their fellow-islanders, whose homes happened to be south of the Trent. Rival instructors also generated rival factions among the youth; and not alone on points of ordinary secular learning. Differences of view in regard to religious questions and matters of conventual discipline aggravated the discord. Each great monastery of the British Islands had a class of its foster-children studying at the place, and these partook of the prejudices of the houses which sustained them. Devotees of the different orders of friars were thus arrayed one against the other: Benedictines against Augustinians; Cistercians against Carmelites; Dominicans against Franciscans. The University, in fact, was dominated in 1264 by the monastic orders.

The subjects of study were nominally good and comprehensive: the seven liberal arts, as they were called: the Trivium, *i. e.*, the study of classical literature, rhetoric and dialectics; the Quadrivium, *i. e.*, arithmetic, geometry, astronomy and music: but almost every one of these was pursued to an extent that we should now consider only elementary, and in a spirit which we should call excessively pedantic and narrow. The logic of Aristotle, received in an abridged, condensed form, not directly from the original Greek, but through a meagre translation in Latin from the Arabic, was applied crudely to all the stock topics of discussion, theology included. And this was held to be the highest exercise of the human mind. Doubtless the gifts of intellect were distributed then as now liberally throughout communities; and, failing really rational and fruitful subjects of speculation, matters the most irrational and useless—albeit extremely ingenious and subtle—exercised the wits of clever men. Consequently, the literary remains of the period referred to, impress moderns most unpleasantly. Two dialogues of the celebrated Abelard, named above, the all-accomplished Master as he was styled in his day,—one between a Christian and a Jew, the other between a Christian and a Philosopher,—may be taken as specimens. And thus speaks one who has looked into them: "Words are wanting," he says, "to express the utter insipidity and absence of all taste, energy or life which these spiritless compositions display: nor can we," he adds, "concede to them the praise of being written in Latin which will bear the test of strict examination." (*English Cyclop.*, art. ABELARD.)

When at a later date the metaphysical, physical and ethical works of Aristotle were discovered and studied,—these, with his Logic, read no longer in translated abstracts but in the original Greek, had a marked effect on the philosophy and science of the universities, expanding and elevating both, and purging both from several errors. (Nevertheless, at the Reformation period, Holbein, in a well-known picture, "Christus Vera Lux," represents Aristotle and Plato plunging into a dark abyss, pope, cardinal, bishop and professor all following them with closed eyes, each holding on to the other.)

Oxford in 1264 was not the beautiful Oxford which is to be seen to-day—a widespread city, rendered conspicuous from afar by dome and turret and spire; remarkable, when you enter it, for streets exceeding fair and broad, traversing it in various directions, flanked every here and there with long lines of collegiate buildings, reverend and picturesque, each disclosing within its vaulted gateway, court and cloister and velvety grass-plot, hall and chapel and library; each, provided in its farther recesses with a pleasaunce of its own, more or less extensive, of lawns and gardens and groves, vocal with birds, fragrant with sweet-scented shrubs and flowers; tranquil paradises, scenes of trim order and comeliness, kept up from year to year with minute, unremitting care. The Oxford of 1264 was, on the contrary, a hard-featured walled town, with few contrivances for luxury or learned ease, its limited area chiefly filled with dingy hostels or lodging-houses, *in which, under the melancholy tutelage of friars of orders* and colours manifold, were herded at night the unkempt youth who flocked to the place from all parts of the kingdom and from abroad, and who during the day were to be seen hastening to and from the lecture-rooms of the various *doctores;* to and from the services in the several churches, thronging the narrow streets and lanes, jostling against each other and against the settled inhabitants of the place, sometimes not without mischievous intent. Mingling with the mass would doubtless be vagrants and charlatans innumerable, native and foreign, who seldom fail to find their way to places where inexperience and folly seem likely to yield a harvest.

Here then it was, amidst surroundings, animate and inanimate, such as these, that Walter de Merton commenced the great experiment which finally developed into the modern English College or University system.

We shall not enter into the discussion relating to the foundation of University College in Oxford, and Balliol, both of which in some

works on Oxford are made to take precedence of Merton in point of antiquity. A legend, now exploded, assigns Alfred the Great as the founder of University College. The real author of its existence appears to have been William of Durham, certain moneys left by whom were appropriated in 1280, and more distinctly in 1311, to the foundation of a House plainly after the pattern of Merton, so far as relates to the matter of residence. And Balliol seems to have taken the form of a College or House for the accommodation of a society of scholars in 1282. Previously, since 1268, sixteen scholars had been charitably sustained at Oxford by John de Balliol (father of John Balliol, the ill-starred King of Scotland); but no house was appropriated to their use until 1282, when, probably after the pattern of Merton again, so far as concerned residence, a building was hired for them in Horsemonger lane, afterwards called Canditch, in the parish of St. Mary Magdalene.

I now give very briefly the leading distinctive features of the new foundation of Walter de Merton, as described by those who have closely examined the original constitution of the College. These appear to have been (1) the union of a discipline resembling, without being really, the monastic, with secular studies; (2) the recognition of Education, rather than ceremonial or ritual duties, or the so-called religious, *i. e.*, monkish, life, as the proper function of the Society; and (3) the liberal provision for the future adaptation of the new system to the growing requirements of the age. (Although I possess and have read the original statutes of Merton, I prefer giving their purport and drift as summarized in an article on the Sexcentenary of 1864 in a London *Times* of the day. I make further use of the same authority below.)

The inmates of the College were to live by a common rule, under a common head; but they were to take no vows and were to join none of the Monastic orders. (As we have already seen, most of the students hitherto frequenting the University had been "sent up" by one or other of the Monastic institutions, and so were committed to the ideas of one or other of the Monastic orders.) They were to study Theology; but not until they had gone through a complete course of instruction in Arts; and they were to look forward, some of them certainly, to being secular clergy, that is, parochial clergy, as distinguished from Regulars or Monks; but many of them also to the public service of the State and the discharge of other important duties in the great lay world.

They were maintained by endowments, but the number of scholars was to increase as the value of the endowments increased; and they were empowered not only to make new statutes, but even, as we have already seen, to change their residence in case of necessity.

The effort of mind required to make such innovations, worked out as they were with remarkable foresight in details, can hardly be estimated at the present day.

Nor did the new regulations of Walter de Merton fail to produce the results intended. The Monastic orders soon began to lose their ascendancy in the University; secular learning began to gain upon the casuistry of the rival religious controversialists; the science of Medicine established itself by the side of Law; and other founders, following, as we have already in some degree seen, the wise example of Walter de Merton, and borrowing the *Regula Mertonensis*, gradually transformed Oxford from a mere seminary for monks, which it was fast becoming, into a seat of national education.

A like change in the character of Cambridge speedily took place. When St. John's College in that University first assumed the position of an educational institution, in 1280, from having been an Augustinian Hospital or Monastery, its statutes were formed after the model of those of Merton. Those of Peterhouse, likewise in the same University, were brought into conformity with the same pattern by Bishop Montague, of Ely, in 1340.

The original statutes of the College of Merton thus, as Chambers, in his History of the Colleges and Halls of Oxford, observes, affords an extraordinary instance of a matured system; and with very little alteration they have been found to accommodate themselves to the progress of science, discipline and civil economy in more refined ages.

And for many a generation Merton held the foremost place among the colleges. The brilliant catalogue of her reputed members includes some of the most illustrious names of the thirteenth and fourteenth centuries. It may be doubtful whether Duns Scotus and Wycliffe should be numbered among them, though there are strong reasons for believing that both once resided at Merton; but Roger Bacon, the Doctor Mirabilis, Bradwardine, the Profound Doctor, and Occam, the Invincible Doctor, have always been claimed as undoubted alumni; and in later times Hooper and Jewell, the reforming Bishops; Bodley, the founder of the library bearing his name; Sir Henry Savile, founder of Lectureships in the University on Geometry and

Astronomy; and Harvey, the discoverer of the circulation of the blood, adorned this most ancient Society. In regard to Duns Scotus, I give the testimony of Johannes ab Incarnatione, from my own folio copy of that learned friar's edition (Conimbricæ, Nonis Martii, in die Beati Thomæ Aquinatis, Anno Domini, 1609,) of the *Oxoniense Scriptum* of Duns *in Librum primum Sententiarum Magistri Petri Lombardi*. He says: *Is adolescens, seu fere puer, ordine Seraphici Patris* [*Francisci*], *et regulam profiteretur Oxonii in provincia Angliae, inibi studio artium liberalium quamprimum destinatur.* And then, after relating his removal to Paris for the study of Theology, he adds: *Inde ad suos regressus in Angliam Oxonii in Collegio Mertonensi ante annum etiam aetatis suae vigesimum sacrae Theologiae lector instituitur. Ibique quatuor Sententiarum libros* [*P. Lombardi*] *publice est interpretatus.*

From the Opus Magus of Roger Bacon above mentioned, I will here add a brief utterance in the true Mertonian spirit, showing that he discerned clearly the defective condition of education as conducted by the majority of his contemporaries, and desired its reform.

"There never was such an appearance of wisdom," he says, "nor such activity in study in so many faculties, and so many regions as during the last forty years, [he is writing in the time of Walter de Merton himself,] for even the doctors [the public teachers] are divided in every state, in every camp, and in every burgh, especially through the two studious orders [Dominicans and Franciscans]; when neither, perhaps," he continues, "was their ever so much ignorance and error. The students," he says, "languish and stupify themselves over things badly translated; they lose their time and study: appearances only hold them; and they do not care what they know, so much as to maintain an appearance of knowledge before the insensate multitude." And again in the same work, the Opus Magus, in respect of Aristotle, he ventures to express such heresy as this: "If I had power over the books of Aristotle, I would have them all burnt, because it is only a loss of time to study them, a cause of error and multiplication of ignorance beyond what I am able to explain." He refers of course to the wretched translations and abstracts which were then alone generally accessible; but it is curious to observe that his view of the Aristotelian philosophy was strongly confirmed three centuries later by his still greater namesake, Lord Bacon, who said, after many years' devotion to Aristotelianism, that it was "a philo-

sophy only strong for disputations and contentions, but barren of the production of works for the benefit of the life of man." (Quoted in Hill's English Monasticism, p. 409.)

I hasten now to shew a certain subtle connexion existing between Walter de Merton's College and Canada; a connexion which, when I had detected it, helped to invest Merton College, in my view at least, with such a peculiar interest.

It happens that three distinguished governors in Canada have been Merton men; and each of them has been conspicuously concerned either in the founding or else in the actual promotion of a system of University Education for the sons of the Canadian people. And it will be seen, I think, in the case of each of these Canadian rulers, that he, either consciously or unconsciously, transplanted to this side of the ocean, and handed on, so far as surrounding circumstances allowed, the Merton traditions — the Merton spirit — in relation to sound learning and wholesome knowledge.

General Simcoe was a member of Merton College. Lord Elgin was a Fellow of Merton. Sir Edmund Head was a Fellow and Tutor of Merton.

I propose to give a sentence or two from the correspondence or public declarations of each of these now historic personages, on the subject of higher Education in Canada; that you may observe for yourselves how the animus of Walter de Merton of the year 1264 still lived and breathed in each of them.

I.—I begin with portions of the correspondence of Governor Simcoe, preserved in the Parliamentary Library at Ottawa and elsewhere. Governor Simcoe was appointed to the newly-constituted Province of Upper Canada in 1791. He had previously seen much active service on this continent during the American Revolutionary war, and had become well acquainted with the character and spirit of colonial communities. Successively an officer in the 35th and 40th regiments, he afterwards had command of a provincial light cavalry corps, known as the Queen's Rangers, which became famous for its efficiency. In all accounts of the struggle for independence the name of the gallant leader of the Rangers repeatedly occurs. In 1790 he was chosen to represent the borough of St. Mawes, near Falmouth, in the county of Cornwall, in the House of Commons, in which capacity he took part in the debates on the Quebec bill in 1791. Even before his departure from England to undertake the oversight

of the virgin province, Governor Simcoe imparted to Sir Joseph Banks, President of the Royal Society, his hope that he should be able to establish therein, among other means of civilization, a University. "A college of a higher class," he says to Sir Joseph, "would be eminently useful, and would give a tone of principles and of manners, and would be of eminent support to Government."

The whole letter to Sir Joseph Banks will repay perusal. We accordingly give it. The sanguine writer, it will be seen, held the opinion that British institutions might, by their evident superiority, when honestly and honourably worked, have their effect even on the United States; might ultimately even win the recently revolted colonies back to the rule of the old mother country. Every year, however, that slipped away without beginning the experiment, made the chance of such a consummation less. The letter is dated January 8th, 1791. It begins:

"Sir,—I was much disappointed that the variety of business in which my good friend Sir George Yonge was engaged, and my own avocations, prevented me from having the honour of being introduced to you, as soon as it was generally made known that I was to be appointed to the government in Upper Canada. But, sir, as it is possible that I may be hurried off, without having much time to spare, in endeavouring to procure in person, such advantages for the community I am to superintend, as must necessarily result from the great encouragement this nation under His Majesty's auspices affords to those arts and sciences which at once support and embellish our country, I am emboldened by letter to solicit that assistance from you, and on those subjects, which I venture to point out, preparatory to my return to London, when I shall hope to have the honour of frequent communication with you, and to avail myself of your ideas and patronage.

"The liberality of your character, the high station you fill, and the public principles which I apprehend that you entertain, leave upon my mind no hesitation of communicating to you, confidentially, my views, and the object which irresistibly impels me to undertake this species of banishment, in hopes that you will see its magnitude, and, in consequence, afford your utmost support to the undertaking.

"I am one of those who know all the consequence of our late American dominions, and do not attempt to hide from myself the impending calamity, in case of future war, because neither in council nor in the field did I contribute to their dismemberment.

"I would die by more than Indian torture to restore my King and his family to their rightful inheritance, and to give my country that fair and natural accession of power which an union with their brethren could not fail to bestow and render permanent.

"Though a soldier, it is not by arms that I hope for this result: it is *volentes in populos* only that such a renewal of empire can be desirable to His Majesty; and I think, even now (though I hold that the last supine five years, and every hour that the Government is deferred, detracts from our fair hopes)—even now, this event may take place.

"I mean to prepare for whatever convulsions may happen in the United States; and the method I propose is by establishing a free, honourable, British Government, and a pure administration of its laws, which shall hold out to the solitary emigrant, and to the several States, advantages that their present form of government doth not and cannot permit them to enjoy.

"There are inherent defects in the Congressional form of government. The absolute prohibition of any order of nobility is a glaring one. The true New-England Americans have as strong an aristocratical spirit as is to be found in Great Britain; nor are they anti-monarchical. I hope to have a hereditary Council, with some mark of nobility."

He then proceeds to speak of the locality which he expected to make the heart and centre of his new community, and of the name which its chief town was to bear.

"For the purpose of Commerce, Union, and Power," he says, "I propose that the site of the Colony should be in that great Peninsula between the Lakes Huron, Erie and Ontario, a spot destined by nature sooner or later to govern that interior world.

"I mean to establish a Capital in the very heart of that Country, upon the River la Tranche, which is navigable for batteaux one hundred and fifty miles, and near to where the Grand River, which falls into Erie, and others that communicate with Huron and Ontario, almost interlock. The Capital I mean to call Georgina. I aim to settle in its vicinity Loyalists who are now in Connecticut, provided that Government approve of the system. I am to have a Bishop, an English Chief Justice, &c."

He then observes that he is aware his views will be deemed chimerical by some in England. He is nevertheless confident of sympathy among many in the New England States.

"This, Sir," he says, "is the outline of my plan, and I trust it will force its way, notwithstanding what circumscribed men and self-interested monopolists may allege against it. It must stand on its own ground; for my extensive views are not what this Country is as yet prepared for, though the New England Provinces are by no means averse to them; and they are the strength of America."

And then he speaks of the alluring contrast, literary and political, which, if he can only obtain proper coöperation and help, his domain will present, when compared with the United States.

"Now, Sir," he continues to Sir Joseph Banks, "not to trespass on your time, you will see how highly important it will be, that this Colony (which I mean to shew forth, with all the advantages of British protectorate, as a better Government than the United States can possibly obtain), should, in its very foundations, provide for every assistance that can possibly be secured for the Arts and Sciences, and for every embellishment that hereafter may decorate and attract notice, and may point it out to the neighbouring States as a superior, more happy and more polished form of government. I would not, in its infancy, have a hut, nor in its maturity, a palace, built without this design.

"My friend, the Marquis of Buckingham," he next proceeds to say, "has suggested that Government ought to allow me a sum of money to be laid out for a Public Library, to be composed of such books as might be useful to the Colony. He instanced the Encyclopædia, extracts from which might occasionally be published in the newspapers. It is possible private donations might be obtained, and that it would become an object of Royal munificence.

"If any Botanical arrangement could take place [this project he knew it would be in Sir Joseph's power to promote,] I conceive it might be highly useful, and might lead to the introduction of some commodities in that country which Great Britain now procures from other nations. Hemp and Flax should be encouraged by Romulus."

Then comes the passage in which he moots the idea of a University, or College of high class, for the community which he is about to found, and to which I have already referred.

"In the literary way," he says, "I should be glad to lay the foundation of some Society that, I trust, might hereafter conduce to the extension of Science. Schools have been shamefully neglected. A College of a higher class would be eminently useful, and would

give a tone of principles and of manners that would be of infinite support to Government."

Then, after describing the surgeon who is to accompany him, and who he evidently thinks will be of use to him in conducting investigations in science, he concludes by promising to call on Sir Joseph when he comes up to town.

"Sir George Yonge," he says, "has promised my old surgeon, a young man attached to his Profession, and of that docile, patient, and industrious turn, not without inquisitiveness, that will willingly direct itself to any pursuit which may be recommended as an object of inquiry.

"I am sure, Sir, of your full pardon for what I now offer to you, from the design with which it is written; and I am anxious to profit from your enlarged ideas. I shall therefore beg leave to wait upon you when I return to London.

"I am, Sir, with the utmost respect,

"Your most obedient and faithful—

"Sir J. Banks, Bart., "J. G. Simcoe.

"President of the Royal Society.

"January 8, 1791."

From this letter it will appear that the organizer of Upper Canada fondly hoped, through British institutions honourably worked in his new province, to Anglicise the United States. He would have been amazed had he been told the day would come when the United States would Americanize the British islands. However, the policy of Governor Simcoe still in some degree governs English statesmen. We see his theory apparently pushed in our own day. For one thing, the distribution of titles of late years has increased. There are many persons in the parent state and elsewhere who expect that such distinctions, combined with the real freedom and more positive civilization and refinement resulting from British institutions within the Canadian Dominion will, if they do not in any way affect society in the United States, at least render the people of the Dominion itself so satisfied with their condition by comparison, that no desire will exist among them for amalgamation with their southern neighbours.

I next give portions of letters addressed by Governor Simcoe to Bishop Mountain, of Quebec. It will be seen from them that he had a very luminous forecast of the future of Canada, and that his plans in respect to it were those of a statesman. He several times refers to his project of a University for Upper Canada.

In a letter to the Bishop, dated Kingston, Upper Canada, April 30, 1795, he observes:

"Perhaps the constitution given to Upper Canada, however late, forms the singular exception to that want of preventive wisdom which has characterized the present times. The people of this Province enjoy the forms, as well as the privileges, of the British constitution. They have the means of governing themselves; and, having nothing to ask, must ever remain a part of the British empire; provided they shall become sufficiently capable and enlightened to understand their relative situation and to manage their own power to the public interest.

"Liberal education seems to me, therefore, to be indispensably necessary; and the completion of it by the establishment of a University in the capital of the country, the residence of the Governor and the Council, the Bishop, the heads of the law, and of the general quality of the inhabitants consequent to the seat of government—in my apprehension, would be most useful to inculcate just principles, habits and manners, into the rising generation; to coalesce the different customs of the various descriptions of settlers, emigrants from the old provinces [the United States] or Europe, into one form. In short, from distinct parts and ancient prejudices to new form, as it were, and establish one nation; and thereby to strengthen the union with Great Britain, and to preserve a lasting obedience to His Majesty's authority. The income contemplated for such an establishment is certainly, of itself, too contemptible to be withheld from the prosecuting of so great an object, on any views of expense."

In accordance with the usage then almost universal, he takes for granted that the professors will be clergymen; and he desires that they shall be in the first instance Englishmen; but he makes some shrewd distinctions: he does not desire the presence of over-refined, over-cultivated clergymen. He was acquainted with the character of the New-England people. The inhabitants of the young province of Upper Canada would be, he knew, of a similar temper, and would require to be ministered to, educationally and otherwise, by competent and earnest men indeed, but men also somewhat homely and humble-hearted. He had likewise doubtless often witnessed the bad effect of incompatibility of manners between pastors and flocks in the mother country.

"I naturally should wish," he says, "that the clergy necessary for offices in the University, in the first instance, should be Englishmen,

if possible, (conforming therein to Mr. Secretary Dundas's opinion, and indeed, in this respect, to my own). But as in an object of such magnitude no explanation can be too minute which fairly and distinctly elucidates these points, which ought not to be misunderstood, I only refer to your lordship's slight experience of the habits and manners of the American settlers, to say how very different they are from those of Great Britain; and how unlikely it is for clergymen, educated in England, with English families and propensities, habituated in every situation to a higher degree of refinement and comfort than can be found in a new country, or possibly anywhere without the precincts of Great Britain—how unlikely it is that such persons should obtain that influence with their parishioners which may effectually promote the object of their mission."

And he looks at the matter, likewise, from the politician's point of view, regarding the Church and its ministers as instruments of government.

"In the infancy of such a government as that of Upper Canada," he observes, "and in the general indisposition of these times to all restraint, it seems to be of peculiar importance to prevent the public interest, both in Church and State, from suffering through any ill-will or disregard which the King's subjects may bear to those persons who are in any manner concerned in its administration.

"On the other hand," he continues in the same strain, "I am persuaded if, at the outset, a few pious, learned men, of just zeal and primitive manners, shall be sent to this country, with sufficient inducement to make them support this honourable banishment with cheerfulness—and that in the first instance your lordship shall not too strenuously insist upon learning as a qualification for ordination, where there are evident marks of religious disposition and proofs of morality—I am confident the rising generation will be brought up competently learned and properly endued with religion and loyalty; and it is probable that they may at least be equal to those of Connecticut in this continent, whose clergy are, in general, inferior to none in those points of learning and of acquisition in the dead languages, which may be generally considered as the necessary materials and instruments of their sacred profession.

"In short, my Lord," he then adds, "if the maintenance of religion and morality be merely considered in a commercial light, as so much merchandise, the bounty which I have proposed, and most earnestly

implore may be for a while extended to it, will augment that produce on which the union of this country with Great Britain and the preservation of Her Majesty's sovereignty may ultimately depend. I am almost ashamed of using this metaphorical language, but it is that of the age."

He then gives his experience as derived from a late excursion through the settlements; and he expresses the fear, if institutions of education and religion continue to be withheld, the inhabitants will at no distant day be desirous of migrating back again to the United States.

"There has nothing," he says, "in my late progress, given me equal uneasiness with the general application of all ranks of the most loyal inhabitants of the Province, that I would obtain for them churches and ministers. They say that the rising generation is rapidly returning to barbarism. They state that the Sabbath, so wisely set apart for devotion, is literally unknown to their children, who are busily employed in searching for amusements in which they may consume that day. And it is of serious consideration, that on the approach of the settlements of the United States to our frontiers, particularly on the St. Lawrence, these people, who by experience have found that schools and churches are essential to their rapid establishment, may probably allure many of our most respectable settlers to emigrate to them, while in this respect we suffer a disgraceful deficiency."

He next alludes to some views of his in regard to the possible future restoration of unity between two religious parties subsisting in the community both of the United States and Upper Canada, and the happy political results that might accrue from such restoration. His views on this head he strongly adheres to, although he is aware they are in danger of being misapprehended.

"A principal foundation," he says, "of the wise and necessary friendship of Great Britain with these her legitimate descendants, I have heretofore pointed out, as to be deduced from the most intimate union and reconcilement between the English Episcopal Church and that of the Independent form of worship used in the New England Provinces—an emanation from the English Church, as all their authors avow, and principally originating from the harsh measures of the secular power which the English Church once exercised, but which is now no more. Though my ideas on this subject, my Lord,

were probably misunderstood, and the lukewarm spirit of the times (had I been even called on for their explanation) would, doubtless, have slighted my reasons as merely struck out in the heat of imagination, and not, as they are, the sober deductions of much thought and of personal observation, yet nothing has happened since I left England in the least to invalidate, to my own conception, the policy of the measures I then proposed; and as far as may be now in the power of His Majesty's Ministers, I most earnestly hope that what remains will be effected—that is, by giving the means of proper education in this province, both in its rudiments and in its completion, that from ourselves we may raise up a loyal and, in due progress, a learned clergy, and which will speedily tend to unite not only the Puritans within the Province, but the clergy of the Episcopal Church however dispersed, to consider with affection the Parent State, to form, corroborate and unite, within the United States, that powerful body of people who naturally must prefer the alliance of Great Britain to that of France, who are mostly members of the Episcopal Church, and on all sides to bring within its pale in Upper Canada, a very great body of denominationalists who, in my judgment, as it were, offer themselves to its protection and re-union." (He appears to have supposed that by certain relaxations on the part of the Episcopal authorities on both sides of the line, the breach between the descendants of the so-called "pilgrim fathers" and the mother-church might be healed, and a universal good will towards England throughoutthe North American continent be established.)

"These objects," he again repeats, "would be materially promoted by a University in Upper Canada, which might, in due progress, acquire such a character as to become the place of education to many persons beyond the extent of the King's Dominions."

As suggestive of a precedent for Government aid to his University projected for Upper Canada, he refers to the grant promised (but never made) to Bishop Berkeley for a College in Bermuda, in 1725. He also hints that the Society for the Propagation of the Gospel would do well also to patronize the undertaking, as likely to aid powerfully in carrying out the benevolent designs of the Society in regard to the aborigines of North America.

"If I recollect, my Lord," he says to Bishop Mountain, "Parliament voted £20,000 for the erection of the University proposed by Bishop Berkeley, in the Bermudas. The object, not to speak dis-

respectfully of so truly respectable a prelate, was certainly of trivial importance to what I now propose." And he adds: "The labours of the Society for the Propagation of the Gospel are visionary, as applicable to the conversion of the American Indians in their present state; but would be of most essential benefit by promoting a University, which, if placed in the part I meditate, would, in its turn, have great influence in civilizing the Indians, and, what is of more importance, those who corrupt them."

He then puts it generally to the Church of the mother country, that its members ought to assist in establishing a University in the Colony, inasmuch as such an institution would be a bulwark therein against the encroachments of dangerous principles which everywhere were endangering society. The term "minute" which he uses, was probably caught from the title of Bishop Berkeley's book, the "Minute Philosopher," directed against the free-thinkers of his day.

"The Episcopal Church in Great Britain," he says, "from pious motives as well as policy, are materially interested that the Church should increase in this Province. I will venture to prophesy its preservation depends upon a University being erected therein, as one of the great supports of true learning against the minute, the plebeian, the mechanical philosophy which, in the present day, from the successful or problematical experiments of ill professors in rational inquiries, has assumed to itself the claim of dictating in religion and morality, and, in consequence, now threatens mankind with ruin and desolation."

The old Universities of England, he suggests to the Bishop, ought also to be applied to for help.

"The Universities of England, I make no doubt," he says, "would contribute to the planting of a scion from their respectable stock in this distant colony. In short, my Lord, I have not the smallest hesitation in saying that I believe, if a Protestant Episcopal University should be proposed to be erected even in the United States, the British nation would most liberally subscribe to the undertaking."

Again, he refers to his project in a letter to Bishop Mountain, under date of "Navy Hall, October 16, 1795," thus:—"My views in respect to a University are totally unchanged; they are on a solid basis, and may or may not be complied with, as my superiors shall think proper; but shall certainly appear as my system to the judgment of posterity."

And once more, to the same correspondent, writing from "York," on the 28th of February, 1796 (the year of his recall), he says:

"I have scarcely the smallest hope of this Government being supported in the manner which I cannot but think proper for the national interests, and commensurate with its established constitution. In particular, I have no idea that a University will be established, though I am daily confirmed in its necessity. I lament these events, from the duty I owe to my King and country, and have only to guard, that no opinion of mine be interpreted to promise beneficial effects, when the adequate causes from which they must originate are suffered to perish or are withheld."

It will be seen, I think, from the tone of the extracts given, that Governor Simcoe, the founder and organizer of Upper Canada, either consciously or unconsciously, was a genuine son of Walter de Merton: (1) in his desire to secure in perpetuity an enlightened training in matters of religion, in manners, in science and practical knowledge, for the community which he had initiated; and (2) in his anxiety to make the institution of education which was mainly to help forward the great work, in the generations that should follow after him, comprehensive and national, aiming, with this object in view, to bring to an end, so far as in him lay, among the people over whom he presided, religious feuds, and irritating, clashing interests.

II.—I turn now to Lord Elgin, Governor-General of Canada from 1847 to 1855; who, before succeeding to the title by the unlooked-for death of an elder brother, was a Fellow of Merton College in the University of Oxford.

I have not been able to lay my hand on any reported speeches of his, having direct reference to the University of Toronto. I have been obliged on this occasion to content myself with portions of other productions of his, shewing his views in regard to high education. It will be seen from these that in a Canadian Governor again Walter de Merton had a genuine representative.

Even while yet a student, but one very near his degree, we have him offering in a private letter to his father a criticism of great weight on the working of the English University system as he found it at Oxford in 1832. His conviction, like that of Roger Bacon of Merton before him, was that education should be no thing of seeming, but as real as possible. His remarks may with advantage be borne in mind.

"In my own mind I confess," he says to his father, "I am much of opinion that college is put off in general till too late; and the gaining of *honours*, therefore, becomes too severe to be useful to men who are to enter into professions. It was certainly originally intended that the degrees which require only a knowledge of the classics should be taken at an earlier age, in order to admit of a residence after they were taken, during which the student might devote himself to science or composition, and those habits of reflection by which the mind might be formed, and a practical advantage drawn from the stores of knowledge already acquired. By putting them off to so late an age, the consequence has been, that it has been necessary proportionably to increase the difficulty of their attainment, and to mix up in college examinations (which are supposed to depend upon study alone) essays in many cases of a nature that demands the most prolonged and deep reflection. The effect of this is evident. Those who, from circumstances, have neither opportunity nor leisure thus to reflect, must, in order to secure their success, acquire that kind of superficial information which may enable them to draw sufficiently plausible conclusions, upon very slight grounds; and of many who have this *form* of knowledge, most will eventually be proved (if this system is carried to an excess) to have but little of the *substance* of it."

The real educational results, that is, to the nation, would be greater and better, if the merely preparatory studies of young men could be made to end earlier, and the time thus gained be converted into an interval calmly and seriously devoted to philosophic inquiry in various directions, by those intended for the professions and others having a genuine love of learning, irrespective of emolument. This is a thought which opens up a noble view of what a University might be.

At the Michaelmas examination of 1832, Lord Elgin was placed in the first class in classics, and common report spoke of him as "the best first of his year." And not long afterwards he was elected a Fellow of Merton.

In Walrond's Memoir, few letters of Lord Elgin are given of a very early date. But we are told that after leaving college, he kept up a regular correspondence on abstruse questions with his brother Frederick, still at Oxford. Some of these letters should have been given for the benefit of students.

Before his appointment to the Governor-Generalship of Canada, Lord Elgin had in Jamaica, where he was Governor in 1842, a field

for educational experiments, of the rudest kind; to the cultivation of which he at once addressed himself.

"The object," says Mr. Walrond, "which Lord Elgin had most at heart was to improve the moral and social condition of the Negroes, and to fit them, by education, for the freedom which had been thrust upon them; but, with characteristic tact and sagacity, he preferred to compass this end through the agency of the planters themselves. By encouraging the application of mechanical contrivances to agriculture, he sought to make it the interest not only of the peasants to acquire, but of the planters to give them, the education necessary for using machinery; while he lost no opportunity of impressing on the land-owning class that, if they wished to secure a constant supply of labour, they could not do so better than by creating in the labouring class the wants which belong to educated beings."

This advocacy of the use of machinery with a view to promoting cultivation of mind in those who must superintend its working, is interesting. In a letter to the Colonial Minister Lord Elgin touches upon the matter himself.

"In urging the adoption of machinery in aid of manual labour," he says, "one main object I have had in view has ever been the creation of an aristocracy among the labourers themselves; the substitution of a given amount of skilled labour for a larger amount of unskilled. My hope is," he continues, "that we may thus engender a healthy emulation among the labourers, a desire to obtain situations of eminence and mark among their fellows, and also to push their children forward in the same career. Where labour is so scarce as it is here, it is undoubtedly a great object to be able to effect at a cheaper rate by machinery, what you now attempt to execute very unsatisfactorily by the hand of man. But it seems to me," Lord Elgin then observes, "to be a still more important object to awaken this honourable ambition in the breast of the peasant, and I do not see how this can be effected by any other means. So long as labour means nothing more than digging cane holes, or carrying loads on the head, physical strength is the only thing required; no moral or intellectual quality comes into play. But, in dealing with mechanical appliances, the case is different; knowledge, acuteness, steadiness, are at a premium. The Negro will soon appreciate the worth of these qualities, when they give him position among his own class. An indirect value will thus attach to education.

"Every successful effort made by enterprising and intelligent individuals to substitute skilled for unskilled labour; every premium awarded by societies in acknowledgment of superior honesty, carefulness, or ability, has a tendency to afford a remedy the most salutary and effectual which can be devised for the evil here set forth."

And again he says in a despatch home, "So long as the planter despairs—so long as he assumes that the cane can be cultivated and sugar manufactured to profit only on the system adopted during slavery—so long as he looks to external aids (among which I class emigration,) as his sole hope of salvation from ruin—with what feelings must he contemplate all earnest efforts to civilize the mass of the population? Is education necessary to qualify the peasantry to carry on the rude field operations of slavery? May not some persons even entertain the apprehension, that it will indispose them to such pursuits? But let him, on the other hand, believe that by the substitution of more artificial methods for those hitherto employed, he may materially abridge the expense of raising his produce, and he cannot fail to perceive that an intelligent, well-educated labourer, with something of a character to lose, and a reasonable ambition to stimulate him to execution, is likely to prove an instrument more apt for his purposes than the ignorant drudge who differs from the slave only in being no longer amenable to personal restraint."

"It is impossible," observes the biographer of Lord Elgin, in a note on the above, "not to be struck with the applicability of these remarks to the condition of the agricultural poor in some parts of England, and the question of extending among them the benefits of education."

The same remarks might be pondered also advantageously by those who entertain the fear that a good educational training, for which such facilities exist amongst us, and for which in the future even greater will exist, will render men disinclined to, and in fact incapacitated for, the work which must be done on Canadian farms, if a home supply of food and clothing material for the population of the country is to be maintained. The probability, on the contrary, is that, gradually hereafter, the effect of a universal educational training, of a judicious kind, and not pushed beyond the point indicated by common sense, will be to render agricultural work in the highest degree inviting to a due proportion of the community; and light in numerous respects where now it is heavy and most weary to the bodily powers-

Like his predecessor, Governor Simcoe, and like Walter de Merton, Lord Elgin did not regard secular education as all-sufficient. He ever took into consideration the religious portion of men's nature. We have a clue to his principles on this point in an extract from a memorandum of his on a systematic course of study for degree, given us by his biographer. It is characteristic of the student James Bruce, and of the mature man Lord Elgin. "Ancient History," he writes, "together with Aristotle's Politics and the ancient orators, are to be read in connection with the Bible history, with the view of seeing how all hang upon each other and develop the leading schemes of Providence." The various branches of mental and moral science he proposes, in like manner, to hinge upon the New Testament, as constituting, in another line, the history of moral and intelligent development.

The sympathies of Lord Elgin, as Governor of Jamaica, as Governor-General of Canada, and as Governor-General of India, were entirely with those who believe (to adopt the words of the Vice-President of the Committee of Privy Council on Education, Mr. W. E. Forster), that, "while it is a great and a good thing to know the laws that govern this world, it is better still to have some sort of faith in the relations of this world with another; that the knowledge of cause and effect can never replace the motive to do right and avoid wrong; that . . . Religion is the motive power, the faculties are the machines; and the machines are useless without the motive power." But, as a practical statesman, Lord Elgin felt that the one kind of education he had it in his power to forward directly by measures falling within his own legitimate province; while the other he could only promote indirectly, by pointing out the need for it, and drawing attention to the peculiar circumstances of his government respecting it.

The persons in the mother country and among ourselves who maintain an agitation in favour of the educational arrangements of former centuries, ignore the facts of modern society, which have been brought into being, not without Providential supervision. It has become impossible now for governments and governors to insist on particular beliefs in communities, however possible it may have been for them to do so once, and however right and perhaps beneficial it was for them to do so then. From the necessity of the case, the modern Cæsar must confine himself to the things of Cæsar. It does not

follow that the modern Cæsar is indifferent to the things of God. For the things of God, so far as man may therein co-operate, Cæsar may be held to believe that other agencies more direct than his own have been ordained; and that for him it remains solely to approve and to encourage, without dictating. Walter de Merton worked out his reform in the national education of England by quietly ascending to a sphere above that occupied by "eremites and friars, black, white and gray," who sought to assert themselves in an exaggerated degree. Somewhat similarly now, in an era of intellectual and spiritual ferment, governments find it essential to just action in respect of many mundane matters, to maintain themselves at an altitude where the air is, comparatively, serene.

We have an utterance of Lord Elgin's, containing words of most wholesome drift, educationally, in a lecture to the Mercantile Library Association at Montreal, in 1848. He said: "The advantages of knowledge, in a utilitarian point of view, the utter hopelessness of a successful attempt on the part either of individuals or classes to maintain their position in society if they neglect the means of self-improvement, are truths too obvious to call for elucidation. I must say that it seems to me that there is less risk, therefore, of our declining to avail ourselves of our opportunities than there is of our misusing or abusing them; that there is less likelihood of our refusing to grasp the treasures spread out before us, than of our laying upon them rash and irreverent hands, and neglecting to cultivate those habits of patient investigation, humility and moral self-control, without which we have no sufficient security that even the possession of knowledge itself will be a blessing to us." . . . . And again, in the same strain: "God has planted within the mind of man the lights of reason and of conscience, and without it [i. e., outside of it] He has placed those of revelation and experience; and if man wilfully extinguishes those lights, in order that, under cover of the darkness which he has himself made, he may install in the sanctuary of his understanding and heart, where the image of truth alone should dwell, a vain idol, a creature of his own fond imaginings, it will, I fear, but little avail him, more especially in that day when the secrets of all hearts shall be revealed, he if shall plead, in extenuation of his guilt, that he did not invite others to worship the idol until he had himself fallen prostrate before it."

In a note on the above lecture, Sir F. Bruce thus writes: "A knowledge of what he [Lord Elgin] was, and of the results which he

in consequence achieved, would be an admirable text on which to engraft ideas of permanent value on this most important question [of education], as helping to shew that to reduce education to stuffing the mind with facts, is to dwarf the intelligence, and to reverse the natural process of the growth of man's mind: that the knowledge of principles, as the means of discrimination, and the criterion of those individual appreciations which are fallaciously called facts, ought to be the end of high education." (Lord Elgin had said in the lecture: "Bear in mind that the quality which ought chiefly to distinguish those who aspire to exercise a controlling and directing influence in any department of human action, from those who have only a subordinate part to play, is the knowledge of principles and general laws." In illustration, he contrasted the qualifications of the mason and carpenter, and the architect;—of the steersman, and the master of the ship;—of the merchant's clerk, and the head of the establishment.)

We now come nearer home. I select a passage from a speech on "the great and important work of providing an efficient system of general education for the whole community," delivered at Toronto, on the occasion of laying the corner-stone of the Normal School in 1851. The statesman indoctrinated with the ideas (modernized) of Walter de Merton again appears. "I do not think that I shall be chargeable with exaggeration," Lord Elgin said, "when I affirm that it is *the* work of our day and generation; that it is *the* problem in our modern society, which is most difficult of solution; that it is the ground upon which earnest and zealous men unhappily too often and in too many countries meet, not to co-operate, but to wrangle; while the poor and the ignorant multitudes around them are starving and perishing for lack of knowledge. Well, then, how has Upper Canada addressed herself to the execution of this great work? How has she sought to solve this problem—to overcome this difficulty? Sir [addressing the Rev. Dr. Ryerson], I understand from your statements—and I come to the same conclusion from my own investigation and observation—that it is the principle of our common-school education system, that its foundation is laid deep in the firm rock of our common Christianity. I understand, sir, that while the varying views and opinions of a mixed religious society are scrupulously respected, while every semblance of dictation is carefully avoided, it is desired, it is earnestly recommended, it is confidently expected and hoped, that every child who attends our

common schools shall learn there that he is a being who has an interest in Eternity as well as in time; that he has a Father towards whom he stands in a closer, and more affecting, and more endearing relationship than to any earthly father, and that that Father is in heaven; that he has a hope far transcending every earthly hope—a hope full of immortality—the hope, namely, that that Father's kingdom may come; that he has a duty which, like the sun in our celestial system, stands in the centre of his moral obligations, shedding upon them a hallowing light, which they in their turn reflect and absorb—the duty of striving to prove by his life and conversation the sincerity of his prayers that that Father's will may be done upon earth, as it is done in heaven."

The successor of Lord Elgin was Sir Edmund Head, who was transferred from the government of New Brunswick to that of the whole of British North America, in 1854. Sir Edmund Head had been not only a Fellow at Merton, but also a Tutor there for several years. He had associated himself at an early period with the advocates of improvement in English education. Among the names of the Local Committee, at Oxford, in 1833, of the famous Society for the Diffusion of Useful Knowledge, the president of which was Lord Brougham, is to be seen that of "E. W. Head, Esq." This indicated in Sir Edmund the possession of much moral courage. The Society for the Diffusion of Useful Knowledge was in its day one of the best abused institutions in England; but it initiated, or rather it powerfully promoted, what had already in the Providential order of things been in other ways initiated, a great change in the intellectual condition of the British nation.

Sir Edmund Head was Lord Elgin's senior by a few years, and it had curiously happened that in the examination at which Lord Elgin won his Fellowship at Merton, Sir Edmund Head had taken part—a circumstance to which Lord Elgin gracefully alluded in his farewell speech at Quebec.

As introductory to my notice of this third Merton man who has been one of our rulers in Canada, I will give the passage in which Lord Elgin, on this occasion, spoke of the gentleman who was about to succeed him in the government. It was at an entertainment given by himself at Spencer Wood, near Quebec, on the eve of his final departure, in December 1854.

"I trust," Lord Elgin said, "that I shall hear that this house [the Governor-General's residence] continues to be what I have ever sought

to render it, a neutral territory on which persons of opposite opinions, political and religious, may meet together in harmony and forget their differences for a season. And I have good hope," he adds, "that this will be the case for several reasons, and, among others, for one which I can barely allude to, for it might be an impertinence in me to dwell upon it. But I think that without any breach of delicacy or decorum I may venture to say that many years ago, when I was much younger than I am now, and when we stood towards each other in a relation somewhat different from that which has recently subsisted between us, I learned to look up to Sir Edmund Head with respect, as a gentleman of the highest character, the greatest ability, and the most varied accomplishments and attainments."

(On this is a note in Walrond's memoir: "Sir Edmund Head, who succeeded Lord Elgin as Governor-General of Canada in 1854, had examined him for a Merton Fellowship in 1833. Those who knew him will recognize how singularly appropriate, in their full force, are the terms in which he is here spoken of.")

Sir Edmund Head visited Lord Elgin, at Toronto, in 1850. A letter to Earl Grey thus opens: "Toronto, Nov. 1, 1850. Sir H. Bulwer spent four days with us, and for many reasons I am glad that he has been here. He leaves us knowing more of Canada than he did when he came. I think, too, that both he and Sir E. Head return to their homes reassured on many points of our internal policy on which they felt doubtful before, and much enlightened as to the real position of men and things in this Province."

It may reasonably be conjectured that Lord Elgin's personal regard and high esteem, united with the weight of his judgment with the home authorities, helped forward Sir Edward's advancement to the high position of Governor-General of British North America.

III.—Sir Edmund Head was not, like his predecessor, a copious and fluent orator. Hence we have not been able readily to find in the local periodicals, reports of addresses of his on the subject of education. No formal Memoir of his Life has been published. His Letters would be worth reading; especially his confidential communications with the home authorities and his English friends, on Canadian affairs as they struck him. His Public Despatches must be valuable documents.

Like some others among the more remarkable of our Canadian Governors, he was probably not fully understood by those who *ex-officio*

were his near associates in the country; and his manner, which had a semblance of austerity, was against him. His time of life, too, when in Canada, was against him, the flexibility and sympathetic temper of youth having, in appearance, departed. He was, as I suppose, a student to the last. I remember the aspect of a small library of books which accompanied him to Toronto. It was a dingy-looking, ragged regiment of volumes, each tome shewing a large number of markers or slips of paper between the leaves, indicating passages at which the reader thought he should like sometime to look again. I had a great desire, I remember, to examine this collection.

That Sir Edmund Head was no neophyte in the modern school of enlightened Englishmen, we have already seen. The sentences which I shall now read, containing opinions of his on the subject of education in general and of Canadian education in particular, are taken from a speech delivered by him at the placing of the cope-stone on the turret of the Great Tower of the University Building, at Toronto, on the fourth of October, 1858. The report of the speech would, I think, have been the better for revision. The stenographer seems not to have caught the sense in every minute particular. One or two phraseological changes have accordingly been made. (For a full account, see the *Journal of Education*, xi., 163. It may be noted that the foundation-stone of the building had been laid exactly two years previously, without any public ceremony; and that one year later, namely in 1859, the professors were vigorously at work in their respective lecture-rooms).

It was in response to a toast at the lunch which followed the ceremony of October 4th, 1858, that Sir Edmund Head spoke. He said: "I shall long remember the kind manner in which the Vice-Chancellor has been pleased to speak of my services in connexion with the University. It is, however, my duty to tell him, and to tell you, gentlemen, that he has greatly overrated those services." (The Vice-Chancellor, Mr. Langton, in a preceding speech, had said that "from the smallest details to the most important matters, Sir Edmund had exhibited an interest in the building; and had it not been for him, he believed it would never have been built.") Sir Edmund then proceeded: "The good sense of the people of this country acknowledged the necessity for such a University and the advantages of the education to be afforded by it; and I have acted only in the discharge of my duty in doing what I have been enabled

to accomplish in promoting the progress and, I hope, in consolidating the foundation of this great institution. But although," he added, "the Vice-Chancellor has overrated my merits in connexion with the institution, he has not overrated my inclination to aid it. That inclination has ever been strong, and will ever continue strong." Then in exactly the strain which we can well conceive Walter de Merton himself adopting, when contemplating the condition of the rising generation of England, in 1264, Sir Edmund continued thus: "I have a thorough conviction that academical institutions, such as are calculated to afford the means of acquiring a superior education, are of the highest value, especially in new countries. They are of value in all countries. They are of value in old countries. But in new countries, which are beset with peculiar difficulties, these results are of great importance to the whole community. Such institutions are doubly important," he said, "where the rougher constituents of society are called upon at an early age to go into the wilderness, there to earn their daily subsistence—they are doubly important in every case where it is necessary that the young men of the country should go forth with those resources which may enable them to pass their leisure free from vice and in a manner befitting a Christian and a gentleman. You have to contend with circumstances which make it doubly difficult to apply a remedy for the softening down of that surface which is necessarily more or less roughened by contact with the world, because in new countries, such as this, men are called into active life at an earlier period than in old countries, and they have not therefore the means of receiving the fullest benefit of a University education.

"It is also clear," he then went on to say, "that however sound may be the basis of classical learning—that however much you may wish to refine those with whom your lot is cast—you must rear an enduring superstructure, or the mass of the community will not be able to receive at your hands the instruction which you desire to put before them.

"I consider," he next observed, "that the instruction inculcated in a University ought to extend a practical influence over a man's life, to enable him to go forth a better citizen and more able to earn his own bread in whatever walk of life he may be placed. In order to discharge these important duties successfully, all kinds of appliances are necessary. I accordingly felt a deep conviction that

amongst the means most essential to the future welfare of the University of Toronto, was that of a building alike worthy of the city in which the University is situated, and of the University itself. Such a building," he said, "was greatly needed, and I did not hesitate, as the Visitor, to sanction the outlay of the money necessary for the erection of the present structure. In so doing I felt convinced that the results would fully justify the step then taken."

He then enlarged on the benefits likely to result from the existence of such a structure as the one which had been erected. "Such a building," he said, "is important in many respects. There is a general disposition to depreciate that of which there is no outward, visible sign. The existence of a building like this, of an important character, commensurate with the growth of the University itself, tends to remove such an impression; and in the next place the appliances connected with the building are of first-rate importance, not only to the pupils of the University, but also to the community amongst whom the University is situated." He instanced the Library. "A few months," he said, "or at most a year or two, may pass, and the room in which we are now assembled will be filled with volumes of books; and in this room the citizens of Toronto, whether they are or are not members of the University, may, if they choose, seek recreation and information."

He then remarks on the influence likely to be exerted by the University Library. The ancient Library of Merton, it may be, passed at the moment through his thoughts. It is worthy of remembrance here, that not only was Merton College the prototype of English colleges, but Merton Library, the quaint old relic of the past which we have described, was the prototype of English college libraries—the first example of such an institution. It is interesting to hear the testimony of a former Fellow and Tutor of Walter de Merton's Society borne to the incalculable value of such a possession—borne on the occasion of the establishment of a similar Library some six hundred years after Walter de Merton's day, in Canada; in a region of the earth then undreamt of.

"The influence of such a library as this," Sir Edmund Head said, "is a most important matter. It is not only so with regard to what the young men take away, but it is so in its general humanizing spirit—in the feeling of respect for literature which grows by the possession of such an institution as this." He then observed on the Museum: "In regard also to another room which we have just left—

the Museum—I shall hope to see collected there such remains as may from time to time be found, and which would otherwise be scattered about and lost, of the aboriginal inhabitants of the country—remains," Sir Edmund added, "which my friend Professor Wilson is as well able to conserve and explain as any man I know. And again, in Natural History; a museum of that sort, constantly open for the reception of specimens, affords the certain prospect of the accumulation of that which is of the utmost importance in the history of science. And you have amongst you," the Governor took occasion to add, "men, such as Professors Hincks and Chapman, who are in every way qualified to occupy a high position in this branch of science.

"Another feature in connection with this building," Sir Edmund Head then said, "which I look upon as of great importance, is that of providing accommodation within the walls of the College for some portion of the students. [An especial feature and peculiarity in the innovations of Walter de Merton, in 1264, was residence within the College walls. Previously, scholars attending the lectures of the jangling doctors were lodged very promiscuously in the streets and lanes of a confined mediæval walled town.] This," Sir Edmund observed, "is undoubtedly one of the most powerful means of forming the character, and maintaining, through the influence of College discipline, that decorum and that sense of propriety with which you would wish to see the pupils leave the walls of the institution."

He then goes on to remark on the architecture of the building, and to interpret, in an interesting manner, its significance.

"I do not know," he says, "that the time would allow me to go more into detail on the points connected with the building as bearing upon the success of the University itself. I cannot, however, sit down without adding a few words in reference to the character of the building. I congratulate the architect," he said, "for having dealt with the structure in the successful manner he has done. I congratulate him, inasmuch as I believe he was the first to introduce this style of building into the American continent. So far as my knowledge extends, I am not aware of any other instance of the Norman or Romanesque style of architecture on the continent. There may be such instances, but I know of none.

"I believe that style," the speaker then went on to say, "is capable of the most useful results. To my own mind it suggests a variety

of analogies, some of them bearing particularly on the nature of the duties of the members of the University here assembled. In the first place, I never see a building of this style of architecture—whether it be ecclesiastical or civil—but I regard it as a type of modern civilization. It is the adaptation to modern purposes of forms which originated long ago—it is the adaptation of Roman architecture to modern civilization. Where did you get these forms? Where did you get the processes which give birth to municipalities—those municipalities which, under different names, are spreading over the continent of America, carrying the principles of local self-government with them? They are from Rome, from whence comes this Romanesque architecture; they are the adaptation of forms derived from Rome to the wants of modern society. Many things in modern Europe are," he added, "precisely analogous to the style of the building in which we are this evening assembled. I will say, moreover," he continued, "that the style of the architecture of this building suggests some reflections upon the duties of the University itself; for it is the business of the University to give a sound classical education to the youth of our country, and to impart to them that instruction and information which are essential to the discharge of their duties as citizens, both in public and private life, according to the wants and usages of modern society. I say, sir, we may take the building in which we are assembled as the type of the duties standing before the University to discharge."

It should be added, that previous to the ascent of the great gateway tower, for the purpose of placing the cope-stone on the apex of its turret, Sir Edmund Head, in the true Mertonian spirit of the olden time, had addressed the assemblage present with the words: "Before proceeding to the work, let us join in supplicating the Divine blessing;" when an appropriate prayer was said by the President of the University, the Rev. Dr. McCaul.

Thus have I endeavoured to occupy your attention, for a short space, with three distinguished Governors of Canada, who were sometime members or fellows of Merton College in Oxford, and who, in relation to the higher education of the Canadian people, shewed themselves, by their words and deeds, worthy descendants of the enlightened Walter de Merton, of the reign of Henry III. Canadians, when they visit Oxford, remembering these things, will, I am sure, look with an added interest on Merton College, for the sake of

men who once had their habitation temporarily within its venerable walls, but who now have become inseparably associated with the history of Canada, from having been the means of transferring hither traditions and ideas and solid institutions which, by an imperishable link, will in all future time unite Canadian scholars with Oxford—with the Oxford of to-day, and strangely likewise with the Oxford of 1264.

We may possibly have had other rulers in Canada who were once members of Merton, or members of some other of the twenty-five colleges or halls of Oxford; but we are not aware of any who have so fully delivered themselves, as the three spoken of, on the subject of University education as adapted to Canada.

Sir Charles Bagot was a member of Christ Church in the University of Oxford; and his was the hand that actually laid the foundation-stone of King's College, out of which University College and the University of Toronto have grown. But we doubt whether his views on University education were quite of a character adapted to the condition of this particular country. He certainly in no way qualified his approbation of the charter of the Canadian National University as it read in 1842. Perhaps it was not his business to do so. He said: "I have ever considered the two Universities of Oxford and Cambridge as the breasts of the mother-country. From them has been derived," he rather sweepingly observes, "all the comforts of pure and social religion—all that is useful and beneficial in science—all that is graceful and ornamental in literature. These same blessings," he then adds, "unless I greatly deceive myself, we have, under Providence, this day transplanted into these mighty regions. There may they continue from generation to generation! There may they serve to instruct, enlighten and adorn your children's children through ages yet unborn, as they have for many ages past the children of our parent state."

And on the plate inserted in the foundation-stone it was set forth in admirable Latin, that "It was the desire of our illustrious Chancellor (*i. e.*, Sir Charles Bagot) that the youth of Canada should, within their own borders, enjoy without delay, and transmit to posterity, the benefits of a religious, learned, and scientific education, framed in exact imitation of the unrivalled models of the British Universities." (Voluit vir egregius ut Canadæ statim esset ubi Juventus, Religionis, Doctrinæ, Artiumque Bonarum Studiis et

Disciplina, præstantissimum ad exemplar Britannicarum Universitatum imitando expressis, ipsa jam frueretur, eademque posteris fruenda traderet.)

The Charter, indeed, of King's College, in 1842, was held and declared by its friends to be an unusually liberal one, considering the time in which it was granted, and the source whence it emanated. On the day of the opening of the Institution, it was stated by the President, Dr. Strachan, that "the Charter of the University of King's College was not hastily settled. It was nearly a whole year under serious deliberation. It was repeatedly referred to the Archbishop of Canterbury, Dr. Manners, who doubted the propriety of assenting to an instrument so free and comprehensive in its provisions. It was considered," the President proceeded to say, "not only the most open Charter for a University that had ever been granted, but the most liberal that could be framed on constitutional principles; and His Majesty's Government declared that in passing it they had gone to the utmost limit of concession." The unprecedented liberality of the Royal Charter consisted in the declaration: "No religious test or qualification shall be required of, or appointed for, any persons admitted or matriculated as scholars within our said College, or of persons admitted to any degree in any Art or Faculty therein, except Divinity."

That it should have been thought, however, that this concession would suffice to render all the other provisions of the Charter acceptable to a community like that of Canada, fills the mind with amazement. The President was at all times to be the Archdeacon of York *ex-officio*. The Council was to consist of the President and seven Professors, who were also, for all time, to be members of the Established United Church of England and Ireland.

I am not now saying anything to the contrary but that all these arrangements would have resulted in a system very efficient; I am simply expressing astonishment, that with a perfect knowledge of the composition of the Canadian people, recruited annually from complex communities like those of the British Islands, it should have been for a moment supposed that in all future time such arrangements as these could be maintained in an institution held to be provincial and quasi-national.

The cautious terms in which the House of Assembly of Upper Canada returned their thanks to the Governor, Sir Peregrine Maitland, when he announced to them the Royal boon of a University

Charter, are very noteworthy. They professed great gratitude to the King, provided "the principles upon which it (the contemplated institution) had been founded should, upon enquiry, prove to be conducive to the advancement of true learning and piety, and friendly to the civil and religious liberty of the people." They plainly had their doubts. From rumours afloat they feared some peril latent in the Royal gift; and, rightly or wrongly, they determined that the youth of the country should not be forced by any power into a training school controlled by any class exclusively.

This, in principle, was the protest of Walter de Merton when, in 1264, he innovated on the prevailing system of education at Oxford, and delivered his little band of scholars out of the hands of the warring Friars. The framers of the Charter of the Canadian King's College of 1842. chose only to contemplate Society as it was, or rather as it had been in years bygone, when in a condition of greater perfection, as they would perhaps have contended.

The plain representatives of the people of Upper Canada, in the House of Assembly, on the other hand, by a shrewd instinct, kept their regards fixed more on the present, more on things as they were among themselves. They were, they knew, a mingled multitude drawn from numerous sources, all accustomed to liberty and notions of equality, desirous, however, of dwelling together in peace; and such a people they were likely to be in the years to come, increasingly. Having, then, the power, they determined by law to abate in time pretensions that must prove finally untenable in whatever quarter they might make their appearance.

The *Regula Mertonensis*, the Merton rule—adopted in all Colleges more or less, and so speedily revolutionizing the University system, in Great Britain at least—was a sign that, in the history of Great Britain, a new era was beginning, with peculiar and increased requirements. Ever since 1264 the spirit of Walter de Merton has been marching on; and he must be obtuse indeed, who does not see that the expansions, the modifications, the changes generally, which are at the present time being advocated, and indeed being gradually adopted in regard to education in all its branches, are, whether we like them or not, the requirements of a new age—requirements of the generations of men who are to succeed us, and who are destined, as we trust and believe, to enjoy—under the superintendence of a benign Providence—blessings of mind, body, and estate, greater even than those which have fallen to the lot of ourselves or our forefathers.

CONTRIBUTIONS TO A FAUNA CANADENSIS;

BEING AN ACCOUNT OF THE

ANIMALS DREDGED IN LAKE ONTARIO IN 1872.

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The present paper is intended as a supplement to the "Preliminary Report on Dredgings in Lake Ontario," which I have already had the honour of submitting to the Government of the Province of Ontario. In that paper I gave a brief account of the results which were obtained in the dredgings which I carried out in the summer of 1872 under the auspices of the Ontario Government. I now purpose to describe more fully the animals obtained in these dredgings; but, before commencing the actual description of these, it may be as well to repeat the description given in the Report already referred to (*Annals and Magazine of Natural History, October, 1872,*) of the nature of the bottom of the lake at various depths.

The dredgings were all carried on in the later part of June and the early part of July, and were made partly from the yacht "Ina" and partly from the steamer "Bouquet." They were entirely carried on by hand, and the dredges and rope were such as are ordinarily employed in deep-sea dredgings. In dredging in deep water, however, a bag of embroidery canvas was attached outside the ordinary net—an addition rendered necessary by the extremely fine nature of the mud at great depths. Even with this precaution, the dredge not unfrequently came up empty from great depths, all the finer portions of its contents having been washed out. In deep water, also, a fifty-six pound weight was attached to the rope about twelve feet above the dredge; and the same was necessary in shallow water, where the weeds were very thick, in order to secure that the dredge should reach the actual bottom.

The dredgings were all carried on within a radius of ten miles from Toronto; and the following will show the general nature of the bottom

at various depths and the chief localities in which the dredgings were prosecuted.

In Toronto Bay itself numerous hauls were made, both from the yacht and the steamer, and the bottom proved very varied, though the depth is almost constantly from two to three fathoms. The greater portion of the Bay, comprising the central portion of its area, appears to consist uniformly of a tenacious, bluish-gray, exceedingly fine, clayey mud, the temperature of which is very low. All the shells in this clay are dead, but it contains numerous small Annelides of the genus *Sænuris*, along with many larvæ of a Dipterous insect allied to *Chironomus* or *Corethra*, the latter being very conspicuous from their brilliant red colour. The muddy bottom appears to be wholly destitute of weeds, and does not seem to encroach upon depths of less than two fathoms.

Towards the edges of the Bay, where the depth diminishes to one and a half fathom or less, the bottom consists of sand, covered over considerable areas with a dense growth of weeds of different kinds. The chief varieties of bottom in this shallow zone are the following:— 1. Pure siliceous sand with dead shells, almost destitute of life. 2. Sandy mud with a dense growth of Charas, containing numerous *Gammari*, small leeches, larvæ of *Chironomus* and Ephemerids, with shells of *Unio*, *Cyclas*, *Pisidium*, *Paludina*, *Planorbis*, *Physa*, *Melania*, and *Valvata*. 3. Sandy mud, sometimes with peaty layers, supporting a luxuriant vegetation of *Anacharis Canadensis* and *Charæ*. The life in these portions of the Bay consisted of much the same animals as the preceding, except that the *Gammari* were absent, unless in the occasional patches of Charas brought up by the dredge. In some places, in from one to one and a half fathom of water, the sand was crowded with *Uniones*, the dredge coming up completely packed with living and dead shells. This was expecially the case at several points under the lee of the "Island," a long, flat, insulated strip of land, which forms the southern boundary of the Bay, running parallel with the shore on which Toronto is built, at a distance of about a mile and three quarters from it.

Another series of dredgings was carried out from a point in the open lake about eight miles to the south of Toronto, on a line extending to the Toronto Rolling-mills, the depth varying from forty fathoms at its northern extremity. The deep dredgings along this line were only partially successful, the dredge bringing up nothing but good-sized

pebbles, and all the finer materials having been washed out before it reached the surface. In about fifteen fathoms the bottom was found to consist of a tenacious blue clay, distinctly laminated, and containing numerous broken-up stems of plants, along with small pebbles. No traces of life could be detected beyond a few minute Annelides of the genus *Sænuris*. Another haul in ten fathoms brought up the dredge full of sand and pebbles with no traces of life; and another in eight fathoms showed a bottom of clean sand, with dead shells of *Cyclas* and *Pisidium*, but devoid of all vestiges of animal or vegetable life.

Another series of dredgings was taken along a line extending in a south-east direction from Gibraltar Point to a point about five miles out in the lake, the depths varying from eight to fifteen fathoms. In this case the bottom was found to consist uniformly of an excessively fine, bluish, argillaceous mud, with numerous patches of a small bushy Alga (a species of *Cladophora*). The mud contained very numerous minute Annelides of the genus *Sænuris*, along with dead shells of *Cyclas*, *Pisidium* and *Planorbis*; and the bunches of *Cladophora* yielded a large number of little Ostracode Crustaceans and a few beautiful little Amphipods, both of which are at present undetermined.

Another series of dredgings was carried out still further to the southwest of the ground examined in the series just mentioned, at a distance of about eight miles from the shore. The depth here varied from thirty to forty or fifty fathoms; and the bottom was found to consist everywhere of a fine grayish mud, sometimes highly argillaceous, sometimes more or less arenaceous, with many small pebbles disseminated through it, and containing a few dead shells of *Planorbis* and *Pisidium*, with much broken down vegetable *débris*. The *Cladophora* was absent, and no traces of vegetable life were detected. Every haul of the dredge brought up numerous specimens of a beautiful flesh-coloured Amphipod and a few minute Oligochætous Annelides; but no other traces of life were obtained. The Amphipods were referable to *Pontoporeia*, and are apparently undistinguishable from *Pontoporeia affinis* of the great lakes of Sweden.

Another series of dredgings was taken in Humber Bay, about four miles to the west of Toronto. Here the bottom, except close to the shore, consisted of a tenacious bluish-gray clayey mud, sometimes with reddish patches in it. Vegetable life was very scanty; and

animal life consisted entirely of many minute Annelides. Close inshore, the bottom consisted of shingle derived from the shales and grits of the Hudson River group.

Lastly, an examination was made, partly with the dredge and partly by means of a hand-net, of the shallow water in the immediate neighborhood of the "Island," and of the extensive ponds which communicate with the lake. The bottom here consisted, for the most part, of a black mud, composed almost entirely of decayed vegetable matter, and supporting a luxuriant growth of *Vallisneria*, *Pontederia*, *Chara*, *Anacharis*, *Nymphæa* and *Nuphar*. Animal life was, naturally, extremely abundant, comprising numerous examples of *Limnæa*, *Physa*, *Planorbis*, *Paludina*, *Cyclas*, *Pisidium* and *Anodon*, along with two species of *Gammarus* and many small Ostracode Crustaceans, a few small leeches (*Clepsine*), very many large scarlet water-mites (*Limnochares*), numerous aquatic insects (*Nepa*, *Gyrinus*, *Dytiscus*, and larvæ of *Chironomus*, *Libellula*, &c.), and a large number of young fishes (*Pimelodus*, *Perca*, &c.). Numerous Terrapins were also observed, and a single specimen of *Menobranchus*, but the latter unfortunately was not secured.

In the following are given the chief characters of the animals obtained in these dredgings. The microscopic species have, however, been, in the meanwhile, omitted from the list. Owing, also, to the impossibility of obtaining here the necessary works of reference, it has not been found feasible in all cases to determine the species, or in some cases even the genus, of some of the specimens.

ANNELIDA.

Of all the forms obtained in the dredgings none are of greater interest than the Annelides. Both the *Hirudinea* and *Oligochæta* are well represented, some of the former exhibiting points of special interest. Some of the Oligochætous Annelides, also, have an extremely wide range, extending to nearly the greatest depths examined, and being rarely absent when the bottom is of a muddy nature. They did not appear to exist, however, in depths beyond twenty fathoms, though small Crustaceans were found at far greater depths than this.

The total number of Annelides which have been made out is seven, three species of *Naididæ* and four species of Leeches. Of the former one species is new, and of the latter no less than three species appear

to be hitherto undescribed. All the Leeches were found in comparatively shallow water, none being detected in depths greater than three fathoms. They all belong also to small forms of *Clepsine* and *Nephelis;* but an examination of the shallower parts of the lake in early spring would doubtless bring to light some forms of greater size.

1. *Clepsine patelliformis*, Nich.

Body much depressed, convex above, flattened or slightly concave below, the width nearly as great as the length when the animal is contracted. The adult is ovate in shape, the anterior extremity somewhat acuminate and narrower than the posterior. The length varies from one-fifth to one-half of an inch; the greatest breadth being about one-fifth of an inch. On the under surface of the head is placed the mouth, in the form of an oval aperture about one-twentieth of an inch in breadth.

The colour is sometimes dark greenish-brown, sometimes nearly black, sometimes light-brown; always covered with innumerable minute black points and numerous yellow spots, the latter being especially abundant towards the margins. The colour probably varies with that of the object to which the leech adheres; but this point was not specially observed. In all the lighter-coloured specimens there are two very distinct dorsal black lines, somewhat interrupted, and placed one on each side of the median line of the back (Fig. 1). In the darkest specimens these lines are hardly distinguishable. In all

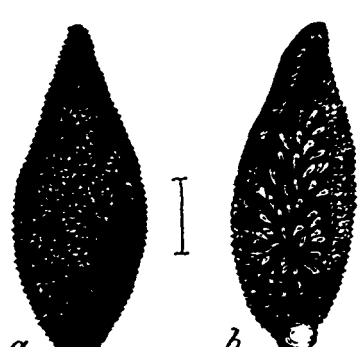

FIG. 1. *Clepsine patelliformis*, Nich.—*a*. Dorsal view of the adult, considerably enlarged. *b*. Ventral surface of the adult, showing the posterior sucker and the parasitic young.

specimens, however, the ventral surface is lighter than the dorsal, and exhibits two distinct black lines, also somewhat interrupted, and also placed one on each side of the middle line of the body. Both the dorsal and ventral lines are slightly curved, and approach one another toward the two ends of the body. Just at the commencement of the dorsal lines, on the top of the head, are situated six minute black ocelli, arranged in three closely approximated pairs one behind the other, the two posterior pairs being the largest and most conspicuous (Fig. 2, *b*).

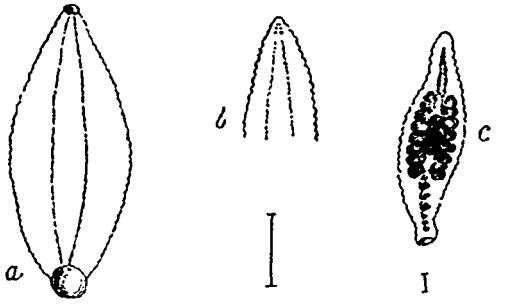

FIG. 2.—*Clepsine patelliformis*, Nich.—*a*. Outline of adult viewed from below, showing the mouth, ventral lines, and acetabulum. *b*. Anterior extremity, enlarged to show the ocelli. *c*. Young, much enlarged, to show the sacculated stomach and pedunculate sucker. The straight lines indicate the real sizes of the adult and young.

The habits of this little leech are very remarkable. The adult leech usually places itself with its ventral surface closely appressed to some foreign body, such as a stone or a dead shell, to which it adheres firmly, like a limpet or small Chiton. It is from this habit that the specific name of *patelliformis* has been chosen. When forcibly detached or irritated, it rolls up like a hedgehog or like the Myriapods of the genus *Glomeris*. The object served by these peculiar habits becomes obvious when it is seen that almost every individual carries attached to the ventral surface of the body a large number (from twenty to thirty) of young leeches (Fig. 1, *b*).

The young are attached to the ventral surface of the parent posteriorly in a close cluster, which is surrounded on all sides by a vacant space. Each adheres to the adult by means of the posterior sucker, which is very distinctly marked and constricted off from the rest of the body (Fig. 2, *c*.) The length of the young varies from about $\frac{1}{12}$ to $\frac{1}{16}$ of an inch; the color being light yellow or reddish, and the

body being semi-transparent. The gullet is distinct, and leads into a much sacculated stomach, which is very conspicuous from its dark color (Fig. 2, *c*). The annulations of the body are very distinct, and the integument is finely tuberculated or papillose.

This extraordinary habit of carrying the young has been noticed by Prof. Verrill, in another species of *Clepsine (Amer. Journ. Science and Arts, III., Feb., 1872);* but I am not aware that attention has otherwise been drawn to it.

In my "Preliminary Report," (Annals of Natural History, Oct., 1872,) I referred this species to the genus *Nephelis*, but it is more satisfactorily placed under *Clepsine*.

Hab.—Common in from two to three fathoms, adhering to stones or to the shells of *Unio crassidens*.

2. *Clepsine sub-modesta*, Nich.

Length in contraction, one-fifth of an inch; in extension, one-quarter to one-half of an inch. Body a long oval, attenuated in front when extended, convex above, concave or flattened below. Back smooth. Two minute black ocelli carried upon the top of the head. The margins of the body exhibiting broad transparent papillose margins, the rest of the body being of a light, dirty, greenish-brown colour. (The preserved specimens are nearly white.) Behind the head, in the middle line of the back, is placed an auditory vesicle or "cervical gland," in the form of a rounded, slightly prominent, chestnut brown spot. Sometimes there are two of these, the smaller being placed a little behind the other (Fig. 3).

The habits of this species are very similar to those of *C. patelliformis*. It carries its young attached to the posterior portion of the ventral surface in a bunch or cluster, and it rolls up into a ball when irritated. The attached young are about a line in length, of a pale whitish-brown colour, semi-transparent, and showing the brown line of the alimentary canal.

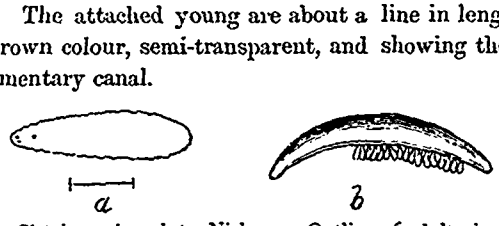

FIG. 3.—*Clepsine sub-modesta*, Nich.—*a*. Outline of adult viewed from above enlarged. *b*. Side view of adult, enlarged, showing the attached young.

This species is nearly allied to *Clepsine modesta*, Verrill *(Amer. Journ. Science and Arts, III.. Feb., 1872);* but it is distinguished

by its much smaller size and paler colour, as well as by the broader and less attenuated form of its anterior extremity. On the other hand, *C. modesta* is described as reaching the length of an inch and a half in extension, being "pale purplish brown or purplish flesh-colour, with minute specks of brown, and very small round spots of a dull yellow, and often of a light green." The anterior portion of the body also is very slender and attenuated. Much stress can not, perhaps, be laid upon the differences in color, but the other distinctions appear to have a specific value.

Hab.—Common in from one to three fathoms, mostly adhering to aquatic plants, but also found on pebbles or dead shells.

3. *Nephelis lateralis*, Say, sp. (?)

The original specimens on which this species was founded were originally obtained by Say from the waters between Rainy Lake and Lake Superior, and were named by him *Hirudo lateralis (Long's Second Expedition, Vol. II., p. 267, 1824.)* They were subsequently referred to the genus *Nephelis*, by Prof. Verrill *(Amer. Journ. Science and Arts, II., p. 451).* Say described the species as being of a livid colour, with a rufous line along each side and a few very remote minute black points, the ocelli being six in number, and placed in a regularly curved line.

The specimen which was obtained in Lake Ontario, and which I have doubtfully regarded as a young example of this species, was about an inch in length when at rest. The colour in life was a liver-brown, not exhibiting any lateral lines. In the specimen preserved in spirits the ocelli can not be made out. Our example, however, agrees with those described by Verrill in being slender and somewhat rounded in front, with rounded lateral margins, and having the posterior portion of the body somewhat depressed.

Hab.—A single specimen was dredged in Toronto Bay in a depth of three fathoms.

4. *Nephelis vermiformis*, Nich.

A small worm-like leech of a red colour during life. Length about half an inch in contraction and one inch in extension; the greatest width about one line. The body slightly narrower anteriorly than posteriorly. Acetabulum oval, oblique, as wide as the body.

Mouth small and rounded, the lips with several folds. In the specimens preserved in spirits no ocelli could be made out. Though

FIG. 4.—*Nephelis vermiformis*, Nich. Enlarged.—*a*. Acetabulum.

certainly new to America, it is possible that this form is only a variety of some other species, but the impossibility of obtaining access to the necessary works of reference renders me unable to speak positively on this point.

The habits of *Nephelis vermiformis* are very different from those of the two species of *Clepsine* already described. Instead of remaining quiescent, attached to some foreign body, it is exceedingly active in its movements, swimming gracefully through the water by means of a serpentine bending of the body.

Hab.—Rare in three fathoms, Toronto Bay.

5. *Sænuris Canadensis*, Nich.

A very slender worm, averaging about an inch in length, but sometimes a little longer or shorter. The body tapering and attenuated posteriorly; the width behind the head being about one twenty-fifth of an inch. Intestine moniliform; anus terminal, with three lobes. Setæ in four fascicles on each segment; each fascicle of three or four setæ; the setæ forked and hooked at their tips. Colour during life red.

Owing to some defect in the spirit in which these specimens were originally put up, their state of preservation was so bad as to render it impossible to make out many important points in their organisation. I have, however, no doubt as to the specific distinctness of this form. It is most nearly allied to the *Sænuris limicola* of Verrill, obtained in Lake Superior, but it is much larger, and the setæ are hooked and bifurcate at their tips, instead of being simply curved and acute.

Hab.—Extraordinarily abundant at all depths in Lake Ontario, wherever the bottom consisted of a fine argillaceous mud. Beyond

twenty fathoms they became much diminished in numbers, and they did not present themselves at all wherever the bottom was of a sandy nature.

6. *Sænuris*, sp.

Worm more robust, shorter, and broader than the preceding. Length from one half to three quarters of an inch; width behind the *head about one twentieth of an inch. Body slightly attenuated* posteriorly. Setæ in four fascicles on each segment; each fascicle of six or eight setæ arranged in a fan; the setæ hooked and forked at their tips. Cephalic lobe broad and sub-conical. Intestine not markedly moniliform.

I entertain little doubt but that this form is a new species; but from the cause already mentioned its state of preservation was so bad as to preclude any minute examination of its peculiarities. I have, therefore, not ventured to assign to it a specific name.

Hab.—Not uncommon on the same bottom and at the same depths as the preceding.

7. *Lumbriculus*, sp.

A fine Oligochætous Annelide, of a red colour, and about two inches in length. Body distinctly annulated. Head conical. Four rows of straight spine-like setæ, arranged in pairs.

This form is very possibly new, but the absence of proper works of reference renders it unsafe to give it a specific title. It is somewhat related to *Lumbricus lacustris*, Verrill, from Lake Superior, but the setæ are straight and not curved.

Hab.—A single individual was dredged in three fathoms in Toronto Bay, on a sandy bottom.

CRUSTACEA.

The Crustaceans which were obtained, though few in number and of small size, present some points of special interest. Owing, however, to want of proper works of reference, I am compelled to leave the *Crustacea* and *Arachnida* at present undescribed.

The most interesting form of the *Crustacea* is a little Amphipod which is probably identical with *Pontoporeia affinis*, Lindström. The importance attaching to this form arises from the fact that it belongs to a genus which is otherwise marine, and that it is found in collections of fresh water as far removed from one another as Lake Superior on the one hand, and Lakes Wetter and Wener in Sweden on the other hand. In these last mentioned localities it is associated with Crusta-

ceans belonging to other marine genera, such as *Mysis*, *Idotea*, and *Gammaracanthus*; and in Lakes Superior and Michigan it is associated likewise with *Mysis*. Both in Scandinavia and in the Upper Lakes of North America the species of *Mysis* is the same, viz., *M. relicta*, Lovén—a species which is regarded by its describer as being identical with the *Mysis oculata*, Fabricius, of both sides of the Atlantic. Upon these facts, Lovén founded the theory that the Scandinavian lakes had formerly been part of the sea, from which they had been cut off by geological changes resulting in the elevation of the Scandinavian peninsula. He believed that the *Mysis* and other species of Crustaceans belonging to marine genera had originally inhabited salt water, but that they had been able to survive and accommodate themselves to the change by which the Swedish lakes were gradually and slowly converted into fresh water, whilst other less plastic forms of marine life had died out. Lastly, he believed that the differences between the Crustaceans of the lakes and the allied species of the neighbouring ocean were due to the modifications which the former had undergone in adapting themselves to live in fresh water.

Without entering into the merits of Lovén's theory, it is extremely interesting to find that Lakes Superior and Michigan have yielded at any rate two of the Crustaceans of the Scandinavian Lakes, namely, *Pontoporeia affinis* and *Mysis relicta*. The last mentioned species, curiously enough, does not appear to exist in Lake Ontario, though plentiful in Lake Superior; probably because the conditions present in the latter lake are somehow more suitable for it. The other species, however, viz., *Pontoporeia affinis*, if rightly determined, abounds in the deeper parts of Lake Ontario.

As before remarked, the Crustacea must be left for the present undescribed; but the following list indicates the forms which were discovered in Lake Ontario, and the habitat of each.

8. *Gammarus*, sp.

A small fresh-water shrimp, varying in length from one-fifth to one quarter of an inch, and of a greenish-brown colour during life, with a dark green intestinal tract. The antennæ and antennules are about half the length of the body, and nearly equal.

Hab.—Numerous examples of this pretty little species occurred amongst *Charæ* and other aquatic plants in depths of from one to three fathoms.

9. *Gammarus*, sp.

A form much smaller than the preceding, of common occurrence in shallow water at the ponds of the "Island."

10. *Crangonyx* (*?*), sp.

A small Amphipod, which may perhaps belong to this genus.

Hab.—Not uncommon in from ten to fifteen fathoms, amongst bunches of *Cladophora* upon a muddy bottom.

11. *Cypris* (*?*) sp.

A small Ostracode Crustacean, probably belonging to this genus, which occurred plentifully, along with the preceding, amongst *Cladophora* upon a muddy bottom and at a depth of from ten to fifteen fathoms.

12. *Pontoporeia affinis*, Lindström.

Small Amphipods, varying in length from one-tenth to one quarter of an inch, and of a uniform pale flesh colour. They appear to be referable to the Swedish species.

Hab.—Very plentiful on a bottom of sandy mud in depths of from thirty to forty fathoms. None were found in depths less than this, though they occur plentifully in Lake Superior in all dredgings from the shallowest to the deepest.

ARACHNIDA.

13. *Limnochares*, sp.

A fine species of this genus of Water Mites was extremely abundant in shallow water and in the ponds at the "Island."

14. *Hydrachna*, sp.

A small Water-Mite occurred abundantly in Toronto Bay in from one to two fathoms.

INSECTA.

15. *Chironomus* or *Corethra*, sp.

The larvæ of a species of Dipteron belonging to one or other of the above-mentioned nearly allied genera occurred abundantly in all the dredgings in which a muddy bottom was found in depths of from two to twenty fathoms, but more abundantly in the smaller depths. The colour varied in different examples from deep blood-red to pink or greenish; and their semi-transparency rendered them very beautiful objects under the microscope.

16. *Ephemeridæ.*

Larvæ of two or three species of Ephemerids were found rarely in shallow water to a depth of two fathoms.

MOLLUSCA.

The *Mollusca*, though very abundant individually, and represented by no less than twenty-one species, present no points of special interest, being all more or less familiar fresh-water forms. It is noticeable however, that their bathymetrical range is not so wide as might have been anticipated from previous researches. With one exception, all the examples dredged from depths greater than perhaps four or five fathoms were dead, and almost all the living individuals were obtained from depths less than three fathoms. *Valvata tricarinata*, alone, was found in a living state in depths extending up to eight fathoms.

17. *Melania Virginica*, Say.

Shell tapering, elongated, with seven whorls above the body-whorl, the whorls slightly rounded, and crossed by longitudinal curved striæ. Aperture sub-ovate, pointed above, its columellar margin slightly thickened and callous. Colour reddish brown or olive, without bands.

Length from one quarter of an inch to one inch; length of aperture in large specimens nearly four lines.

I at first thought this species might be only a variety of *M. depygis*, Say; but it appears on more careful examination to belong to *M. Virginica*.

Hab.—Common in from two to three fathoms in Toronto Bay.

18. *Planorbis trivolvis*, Say.

Shell most readily recognised by the fact that it is carinated on both sides, but most markedly on the right side, on which the volutions of the shell form a depressed spire. The lip is thickened internally, and is angulated opposite each carina. The whorls are marked with curved transverse lines, and the general colour of the shell is pale olive.

Hab.—Very common in shallow water, but not extending beyond three fathoms.

19. *Planorbis*, sp.

A form allied to the preceding, but which I have been unable to identify. It is distinguished from *P. trivolvis*, Say, by its much

more rounded and ventricose form, by having the spire on one side perfectly flat and exhibiting all the whorls; whilst the other side is depressed but widely open. The flat side of the shell is carinated, and the aperture angulated opposite to the carina. The whorls are crossed by numerous fine curved lines. Colour pale brown or olive.

Hab.—Rare in Toronto Bay in one to two fathoms.

20. *Planorbis parvus*, Say.

This little species is easily made out by its small, thin, discoidal shell, both sides of which exhibit all the volutions. The upper side is nearly flat, though concave centrally, and the umbilicus is shallow and wide. The aperture is oblique and rounded, and the lip is acute and thin. Colour yellowish or pale brown. The larger specimens attain a diameter of nearly two lines, the smaller about one line.

Hab.—Not uncommon in Toronto Bay in from one to three fathoms.

21. *Valvata tricarinata*, Say.

Shell small, thin, slightly elevated, with a large and deep umbilicus exposing the whorls. Whorls three, strongly keeled with two carinæ, and marked with transverse curved lines. Aperture round, complete; lip thin. Suture deeply impressed. Colour pale greenish-brown or brownish white. Full-grown specimens about one-tenth of an inch in height by nearly two lines in diameter.

Hab.—Abundant, crawling over aquatic plants, in from one to eight fathoms. Most abundant in Toronto Bay.

22. *Valvata sincera*, Say.

Shell small, thin, slightly elevated, with a large and deep umbilicus exposing all the volutions. Whorls three or nearly four, rounded and not carinated, marked across with very numerous and regular curved striæ. Aperture round, complete, the lip thin and acute. Colour light brownish, or brownish-green. Size variable, large specimens being almost a line in height with a diameter of nearly two lines.

This species is very closely allied to *Valvata tricarinata*, Say, from which it differs almost solely in the fact that the whorls are rounded instead of being keeled. This peculiarity gives a very distinct *facies* to the two shells, and there is not the smallest difficulty in picking out well-marked examples of each. A number of intermediate examples, however, occur, in which there are more or less faintly or

strongly pronounced carinæ on the whorls. It is thus rendered a matter of opinion whether the two species should not properly be thrown into one.

Hab.—Common, adhering to water plants, in depths of from one to five fathoms.

23. *Paludina decisa*, Say.

Shell ovate, with an elongate spire. Whorls four or five, rounded, with faintly-marked or obsolete transverse striæ. Aperture subovate, angulated posteriorly; lip thin. Operculum horny, concentrically striated.

Colour variable, generally olive-green, often tinged orange-brown or russet; interior generally of a purplish tint.

Length of large specimens one inch, by seven-tenths of an inch in diameter; of small specimens three-tenths of an inch by one-fifth of an inch in diameter.

Hab.—In a living state and in all stages of growth, in from two to three fathoms, on a sandy bottom.

24. *Amnicola porata*, Say, sp.

Shell minute, obtusely conical, of four rounded whorls, which are separated by a well-marked suture, and have a smooth surface. Aperture somewhat ovate, and slightly angulated posteriorly, the posterior half of the inner lip confluent with the columella. Umbilicus small but well-marked. Colour olive-green. Dimensions of adult shell nearly two-tenths of an inch in length by a little more than one-tenth of an inch in diameter.

Our specimens differ in some trivial respects from typical examples of *Amnicola (Paludina) porata*, Say; but these differences do not appear to have more than a varietal value.

Hab.—Very abundant, crawling over the stems of *Chara* and *Anacharis*, in from one to three fathoms.

25. *Limnæa jugularis*, Say.

Shell of large size, thin, nearly translucent, with ventricose whorls. Whorls six in number, rounded. Spire regularly tapering, a little shorter than the aperture. Aperture large, the inner lip nearly straight, with a deep, oblique columellar fold. Outer lip somewhat expanded. No umbilicus. Colour olive, light brown, or ferruginous. Length of largest specimen observed, one inch and a half, with a diameter of seven-tenths of an inch.

Hab.—Abundant in shallow water at the "Island."

26. *Limnœa*, sp.

A small undetermined species allied to *Limnœa columella*, Say.

Hab.—Rare in from one to two fathoms in Toronto Bay.

27. *Physa heterostropha*, Say.

Shell sinistral, with a ventricose and capacious body-whorl. Spire short, of three whorls, acute. Suture distinct. Aperture about three-fourths as long as the shell, somewhat oval, acute posteriorly. The outer lip thin; the inner lip thickened in front.

Colour dark brown, semi-transparent. Size variable; length of large specimens from one half to seven-tenths of an inch.

Hab.—Common in shallow water at the "Island."

28. *Physa*, sp.

A small fragile, horn-coloured form, much resembling the preceding in most respects, and, perhaps, its young.

Hab.—Rare in from one to three fathoms.

29. *Cyclas similis*, Say.

Shell transversely oval, with strongly convex, nearly equilateral valves. Anterior and posterior margins nearly equally rounded, the anterior slightly the most so. Base nearly straight. Umbones nearly central, directed slightly forward, obtuse. Surface with numerous, regular, concentric striæ. Cardinal teeth, two in number, minute, oblique. Lateral teeth elongated, oblique, bifid on one side. Colour paler or darker brown, sometimes with a greenish tinge; internally bluish white.

Transverse diameter from one half to seven-tenths of an inch; vertical diameter from three to five-tenths of an inch.

Hab.—Common in from one to three fathoms.

30. *Pisidium abditum*, Haldemand.

Shell minute, ovate, concentrically striated, inequilateral. Umbones directed anteriorly. Anterior margin obtusely rounded; posterior margin somewhat pointed; base slightly rounded. Shell ventricose; beaks in contact. Colour yellowish-brown or flesh-coloured. Transverse diameter one-tenth of an inch; vertical diameter the same, or slightly less.

Hab.—Common in from one to five fathoms.

31. *Unio crassidens*, Lamarck.

Common, both in the living and the dead state, in from one to three fathoms in Toronto Bay.

32. *Unio ochraceus*, Say.

Common in Toronto Bay, in from one to three fathoms.

33. *Unio complanatus*, Solander.

Common in Toronto Bay.

34. *Unio*, sp.

A large, ventricose form, occurring rarely in Toronto Bay, in from one to three fathoms.

35. *Unio*, sp.

A small, elongated form, in Toronto Bay.

36. *Anodon fluviatilis*, Dillwyn.

Common in the shallower parts of the lake.

37. *Anodon*, sp.

Common in Toronto Bay, in from one to three fathoms.

VERTEBRATA.

38. *Pimelodus catus* (*P. atrarius*).

The young of this common species of Cat-fish occurred in great numbers at the "Island." Their length was from less than one inch to as much as an inch and a half.

39. *Pomotis vulgaris*.

The young of the "sun-fish," or "Northern Pomotis" of Richardson, also occurred plentifully in shallow water at the "Island." The largest specimen obtained was about two inches and a half in length.

40. *Perca flavescens*, Cuvier.

The American Yellow Perch. Common throughout Toronto Bay.

41. *Leuciscus*, sp.

Two individuals of a small species of this genus were brought up by the dredge in Toronto Bay, from a depth of about two fathoms.

42. *Emys picta*.

The "painted Turtle." Occurred plentifully in shallow water at the "Island."

43. *Menobranchus maculatus*.

A single individual was observed in shallow water at the "Island," but unfortunately escaped capture.

ANALYSES OF CANADIAN MINERALS.

BY E. J. CHAPMAN, PH.D.,
Professor of Mineralogy and Geology in University College, Toronto.

The following analyses of some of our commercial ores and economic minerals were made recently in the assay-office of the writer. It is proposed to publish in the *Journal*, from time to time, additional analyses of similar character.

(1.) SAMPLE OF FLUOR-APATITE FROM THE TOWNSHIP OF BEDFORD (LOT 2, CON. xii).

This sample, of about 2 lbs. in weight, shewed throughout its mass a well-marked lamellar structure and pale apple-green colour. Sp. gr. = 3·18. Average composition:

Phosphate of Lime	88·32
Fluoride of Calcium	7·12
Chloride of Calcium	0·53
Carbonate of Lime (intermixed)	2·33
Sesquioxide of Iron	traces.
Silica	1·57
	99·87

(2.) SAMPLE OF FLUOR-APATITE FROM SOUTH CROSBY (LOT 13, CON. vi).

A lamellar apatite of a mixed reddish and pale-green colour. Sp. gr. = 3·16. Average composition:

Phosphate of Lime	87·92
Fluoride of Calcium	7·08
Chloride of Calcium	0·57
Carbonate of Lime (intermixed)	1·26
Sesquioxide of Iron	0·27
Silica	2·72
	99·82

NOTE.—In these commercial analyses, after separation of the intermixed carbonate of lime and the siliceous rock matter, the lime, phosphoric acid, and chlorine were determined directly, and the fluorine was calculated from the amount of lime in excess of that required by the phosphate and chloride. When the crushed mineral is warmed with sulphuric acid, the evolved fumes exert a strongly-marked corrosive action on glass. The samples analysed were not obtained personally, but they were said to represent fairly the general

character of the deposits from which they were taken. Very probably, however, these deposits when opened out will be found to contain a larger percentage of intermixed carbonate of lime and siliceous matter than is shewn in the above analyses. The samples were accompanied by others, labelled equally "phosphate of lime," but which consisted of large greyish-green crystals of pyroxene, much resembling apatite to an unpractised eye, but easily distinguished in most cases by their shape. In some, nevertheless, the prisms were six-sided, or composed of the four ordinary prism-planes, with the two planes of the front or ortho-pinakoid, the clino-pinakoid faces, so commonly present, being either wanting or reduced to mere lines. One of these samples was marked "Osso: Crow Lake."

(3.) IRON ORE FROM THE TOWNSHIP OF BEDFORD.

This sample consisted of black, strongly magnetic ore, shewing polarity, and presenting a cleavable structure. Sp. gr. = 5·05. The average composition was as follows:

Protoxide of Iron	26·93
Sesquioxide of Iron	59·39
Sesquioxide of Manganese	trace only.
Alumina	0·67
Magnesia	0·89
Lime	0·33
Titanic Acid	3·23
Phosphoric Acid	trace only.
Sulphur	0·07
Silica and siliceous rock-matter	8·38
	99 82

Metallic Iron = 62·52 p.c.

NOTE.—Another sample of magnetic ore of a very similar character, also from Bedford, but said to have come from a different deposit, was found to contain 5.11 p.c. titanic acid, with 29.03 protoxide, and 56.52 sesquioxide. When titanic acid is present, the amount of protoxide of iron seems to be always in excess of the amount normally present in the magnetic compound. The percentage of titanic acid does not appear to be always constant in the same deposit. A sample of magnetic ore from South Crosby gave Dr. Sterry Hunt, for example, 9.80 p.c., whilst another portion of this ore was found by Dr. Hayes, of Boston, to hold no less than 16.45 p.c. Hence an ore containing even a small proportion of titanium may be viewed with a certain amount of suspicion as regards its ulterior yield. The presence of titanium does not, of course, affect the quality of the reduced metal, as the whole of it, or essentially all, goes into slag. But it affects the quality of the ore, and in three ways: first, by taking the place of iron in the ore; secondly, by rendering the ore, in general, more refractory; and thirdly, by carrying off a certain amount of metal in passing into slag. Where the amount of titanic acid in an ore does not exceed, however, 4 or 5 p.c., it is of no material consequence.

(4.) IRON ORE FROM THUNDER BAY, LAKE SUPERIOR.

This sample consisted of fine-grained magnetic ore, comparatively light in colour, very hard, and breaking with irregular splintery fracture. Sp. gr. = 4·98. Its analysis shewed:

Protoxide of Iron	25·87	26·18
Sesquioxide of Iron	58·48	58·70
Sesquioxide of Manganese	0·34	0·27
Silica	15·46	14·68
	100·15	99·83
Metallic Iron =	61 p.c.	61·36 p.c.

NOTE.—This ore contains merely faint traces of titanium, phosphorus, and sulphur. The large per centage of silica detracts, however, greatly from its otherwise pure quality. Unless carefully slagged by a large addition of suitable flux, the silica would eat into the furnace lining, and would also rob the ore largely of metal in passing into slag. The extreme hardness and splintery nature of this ore are likewise objectionable features.

(5.) AURIFEROUS MISPICKEL FROM MARMORA (LOT 7, CON. ix).

The sample subjected to assay was obtained personally from a depth of about 70 feet below the surface of the ground. It weighed thirty-six pounds, and gave the following results:

(1.) *Crushed sample, as brought to surface.*

Gold ...2 oz., 13 dwts., 16 grs.=$55 44....
Silver ..... 4 dwts., 16 grs..... } Per Ton of 2000 lbs.

Gold....3 oz., 0 dwts., 12 grs.—£12 10s. stg
Silver ..... 5 dwts., 5¼ grs..... } Per Ton of 2240 lbs.

(2.) *Sample partially freed by rough dressing from intermixed quartz.*

Gold....4 oz., 6 dwts., 8 grs.=$89 18....
Silver ..... 7 dwts., 0 grs..... } Per Ton of 2000 lbs.

Gold ...4 oz., 16 dwts., 17 grs.=£20 stg....
Silver ..... 7 dwts., 20 grs..... } Per Ton of 2240 lbs.

(3.) *Portion of pure or nearly pure mispickel.*

Gold....5 oz., 5 dwts., 0 grs.=$108 46...
Silver ..... 9 dwts., 8 grs..... } Per Ton of 2000 lbs.

Gold ...5 oz., 17 dwts., 14 grs.=£24 6s. stg.
Silver .....10 dwts., 11 grs..... } Per Ton of 2240 lbs.

NOTE.—These essays, published in a report on the Dean and Williams Mine last December, fully confirm the fact to which attention was first called by the writer some time ago, that the true ore of gold in the Hastings District is the mineral Mispickel. As this ore occurs abundantly throughout North Hastings, and is everywhere more or less auriferous, the amount of gold locked up in it in that part of the Province alone must be exceedingly great. It is equally auriferous, and has been equally neglected, in Nova Scotia.

THE HORITES.

BY THE REV. JOHN CAMPBELL, M.A., TORONTO.

The student of Biblical History cannot fail to notice the remarkable prominence given to one supposed Canaanitish people over all others mentioned in the Pentateuch. This is the tribe of the Horites, who dwelt in their mount Seir. The first mention of this family is in Genesis xiv. 6, where they are numbered among the peoples defeated by Chedorlaomer and his associates. In Deuteronomy ii. 12, 22, they are again spoken of as the ancient possessors of the land occupied by the descendants of Esau. Bishop Patrick supposed that the Horites had dwelt in that region since the days of the Deluge, although he did not suggest a line of Noah's descendants with whom they might have been connected.[1] In Genesis xxxvi. a singularly minute and full account is given of the families of this people, the only apparent reason for it being that Esau and his son Eliphaz married women of their race, and that the Edomites dwelt with them in the land of Seir. The genealogies of the Horites there given are as follow:

"These are the sons of Seir the Horite, who inhabited the land; Lotan, and Shobal, and Zibeon, and Anah, and Dishon, and Ezer, and Dishan: these are the dukes of the Horites, the children of Seir, in the land of Edom. And the children of Lotan were Hori and Homam; and Lotan's sister was Timna. And the children of Shobal were these; Alvan, and Manahath, and Ebal, Shepho and Onam. And these are the children of Zibeon; both Ajah, and Anah: this was that Anah that found the mules in the wilderness, as he fed the asses of Zibeon his father. And the children of Anah were these; Dishon, and Aholibamah the daughter of Anah. And these are the children of Dishon; Hemdan, and Eshban, and Ithran, and Cheran. The children of Ezar are these; Bilhan, and Zaavan, and Akan. The children of Dishan are these; Uz, and Aran. These are the dukes that came of the Horites; duke Lotan, duke Shobal, duke Zibeon, duke Anah, duke Dishon, duke Ezar, duke

[1] Commentary on Genesis. Ch. xxxvi.

Dishan: these are the dukes that came of Hori, among their dukes in the land of Seir." Genesis xxxvi. 20-30. Among these we find that Anah, the father of Aholibamah, is (Gen. xxxvi. 2) the son of Zibeon; it is, therefore, probable that Dishon, the father of Hemdan, &c., may be the son of Anah. This would reduce the number of lines to five. If, however, Timna, the concubine of Eliphaz, the son of Esau (Gen. xxxvi. 12), be the same as Timna, the sister of Lotan, it is manifestly impossible to make Lotan a contemporary of Zibeon, Anah, or even Dishon. Zibeon must have lived about the time of Abraham; and Shobal, Ezar and Dishon, if they are his brethren, at the same period. The importance of this Horite line may be judged from the fact of its reappearance in the first chapter of the first book of Chronicles, where the above genealogy is given with some slight variations in the orthography of the individual names.

It is, to say the least, remarkable that a genealogy connecting with the family of Abraham in a way comparatively unimportant should be given at such length. Esau had other wives, Hittites, of Elon and Beeri, yet nothing appears concerning their families but the names of their fathers. Now the Hittites were a powerful people even at the time of Esau, and waged successful wars with many of the Pharaohs in later years. True, we find a brief account (Gen. xxii. 20) of the immediate descendants of Nahor, the brother of Abraham, from whose family came the wife of Isaac and the two wives of Jacob; but this is not to be wondered at seeing that these were so intimately connected with the great patriarch himself. The sons of Abraham by Keturah, the children of Ishmael, and those of Esau, are, as we might expect, named, in some cases, with their grandsons. But nothing is recorded of the families to which Hagar, or Keturah belonged; the name of Ishmael's wife is not even mentioned; and no genealogy enlightens us in regard to the connections formed by the heads of the Twelve Tribes. A simple mention of the immediate progenitors of Aholibamah would not have been matter of great surprise; but this long Horite genealogy certainly ought to be so with every serious student of the Mosaic record.

Still more extraordinary should this list appear, if, as almost all writers who have treated of them suppose, the Horites were an obscure race of uncivilized troglodytes, whom the Edomites without much difficulty extirpated. Strange that the great lines of Egypt and Assyria should pass without notice; that the powerful families

of Moab and Ammon should have no record; that Ishmael's grandsons do not appear; and these miserable cave-dwellers have so much of Scripture allotted to them! Whatever view we may be inclined to take of the books of Moses, whether we regard them as an inspired production, or the work of a man wise beyond all his fellows, the problem remains the same. What is the Divine purpose in giving such a genealogy? or what was the end of the historian in placing it on record?

An objection naturally urged against the attempt to answer such a question is, that neither sacred nor profane history gives us any more information regarding the Horites. This I deny; for I profess to have opened the door at which many have knocked in vain, and from induction of facts historical, mythological, philological, and geographical, to be able to prove the truth of the following six propositions regarding this ancient people:

I. That the Horites were no obscure troglodytes, but a race pre-eminently noble and distinguished.

II. That they have left distinct geographical traces in and about Palestine, which find their counterparts in other lands.

III. That one family of the Horites appears, in a somewhat disguised form, in the second and fourth chapters of the first book of Chronicles, and there furnishes the link of connection with other histories than that of the Bible.

IV. That in this family we find many of the divinities and some of the earliest rulers of Lower and Upper Egypt.

V. That from this family came the Caphtorim, who invaded Palestine before the close of the wanderings of Israel.

VI. That reminiscences of the Horites, and confirmation of all the preceding propositions, are found in the early history and mythology of Phœnicia, Chaldea, Arabia, Persia, India, Asia Minor, Greece, Italy, and of the Celtic and German peoples.

I proceed at once to the proof of the above six statements, the first two being simply introductory, and depending greatly for confirmation upon the establishment of the third and following propositions.

I.—THE HORITES WERE NO OBSCURE TROGLODYTES, BUT A RACE PREEMINENTLY NOBLE AND DISTINGUISHED.

We have already seen that some of the heads of tribes or dukes of this race were contemporaries of Abraham. Their ancestor Seir, and that other ancestor Hori, mentioned in Gen. xxxvi. 30, who cannot be the son of Lotan, take us back to an older period still. In Abraham's time they were of sufficient importance to attract the attention of Chedorlaomer, and dwelt at no great distance from the cities of the plain, "the opulent Pentapolis of the Jordan." They are classed with the Rephaim, the Zuzim, the Emim and the Avim, whom there is strong reason for making Japhetic peoples connecting with Riphath, Javan, &c.. more especially as their names do not occur among the tribes of Ham. They represent a second wave of population moving westward from Babel, the first being a purely Hamitic stock that had passed over Jordan and probably into Egypt, in both of which regions they soon became the serfs of a nobler race. The Shemites, with the exception of Abraham and his family, still kept to their ancient seat. Esau, a proud and warlike man, was not ashamed to ally himself with a Horite princess. He seems, indeed, to have entered upon this alliance on unequal terms, inasmuch as certain of the dukes of Esau (Gen. xxxvi. 40), Timnah, Alvah, Aholibamah, bear Horite names, while no Horite duke bears the name of an Edomite. It is also to be noted that two of these are the names of females, although they stand at the head of the list of the Aluphim or dukes. In ancient times for a woman to give her name to a family was a mark of high honour, and such, undoubtedly, was the position that the Horite element occupied in the Edomite family. Obadiah iii. is often quoted as a passage which proves the Horites to have been troglodytes, inasmuch as the Edomites, who supplanted them, are there described as dwelling "in the clefts of the rock;" but who will dare to call the proud, free and warlike Edomites cave-dwellers? A better name should be found for those whose skill and marvellous industry fashioned the palaces of Petra, leaving marks of a high civilization, that nothing but a great convulsion of nature can efface, whether they be Edomites or the sons of Hori. These troglodytes, if men will call them so, were a great people. It is interesting to observe that Josephus calls the descendants of Abraham by Keturah by the same name, and yet represents them, quoting the words of an ancient historian, as the conquerors of Egypt and founders of the Assyrian Empire.[2]

[2] Josephi Antiq. Lib. I. Cap. 15.

But, apart from these facts, the primary meaning of the root Hor or Chor, for the initial letter is the Hebrew Cheth, is not a cave-dweller. It would be strange indeed if it were. The word is an adjective, and means white, pure, and hence noble. The interpretation *troglodyte* is a conjectural one, derived from false historical reasoning. In so far as the meaning obtains in the Hebrew language, it denotes historical corruption of the original sense, such as we find in our English words *pagan* and *villain*, *Whig* and *Tory*, or, better still, in the word *Bohemian*. As well might later writers pretend that the original Bohemians were a horde of vagabonds, as those of the present day, that the Horites were a race of miserable dwellers in caves. The children of Seir, the Horite, were the white race of their age, the purest of all the Japhetic families, the nobles of the world's early history. Their name is a synonym for all these qualities in many tongues, and especially in those of the Indo-European class. The Greek *heros, a hero, or demi-god*, with *Hera the mistress*, as a name of Juno, the German *Herr*, and hence, by the conversion of the aspirate into a sibilant, our English *Sir*, are a few of the later forms of this famous word, which fills a large part of the vocabularies of many languages.[2]* It appears in connection with the number seven, representing the seven dukes of that princely family, in the *seven Harits*, the bright ones of Sanskrit mythology; and these, with the preservation of the guttural or strongly aspirated Cheth, meet us again in the seven Greek *Charites*, or, without it, in the seven *Horae* of the same theogony. This is hardly the place yet to enter upon the connection of the names of the individual Horites with those which appear in the history of the Indo-European families. Still, I may be permitted here to indicate some of the links that bind the Scriptu·e genealogy to the traditions of ancient nations. Lotan is a root that appears in Latona, Latinus, and many other venerable names; nor is it unworthy of attention that, as Latona is the mother of Horus Apollo, so Lotan's eldest son bears the identical appellation, Hori. Shobal, which connects with *Shibboleth, an ear of corn*, is, as Hyde unwittingly shows, the Arabic Sambula, which he makes equivalent to the Greek Sibulla, and also to the Latin Spica, meaning the same thing.[3] In Aholibamah we have, I am assured, the original

[2]* Guigniaut, Religions de l'Antiquité, iii. 833, seq. Fuerst in his valuable lexicon gives Phœnician Hor or Chor, the meaning of which is *noble* and *free*.

[3] Hyde, Religio Veterum Persarum, 398.

of the Greek Olympus, in the Ionic dialect *Οὔλυμπος*, a word for which no derivation can be found, and all the associations of which agree admirably with the meaning of the Hebrew term "tent of the high place." The very word *bamah, the high place*, survives in the Greek *bema*. I shall yet have occasion to show the force of the following Homeric gloss upon the words of Moses. Speaking of the children of Zibeon the sacred writer says, "This was that Anah that found the mules in the wilderness, as he fed the asses of Zibeon, his father." The words of the Greek poet are:[4]

"Παφλαγόνων δ' ἡγεῖτο Πυλαιμένεος λάσιον κῆρ,
'Εξ 'Ενετων, ὁθεν ἡμιόνων γένος ἀγροτεράων."

"The rough heart of Pylaemenes led the Paphlagonian
Eneti, whence is the stock of wild mules."

II.—THE HORITES HAVE LEFT DISTINCT GEOGRAPHICAL TRACES IN AND ABOUT PALESTINE, WHICH FIND THEIR COUNTERPARTS IN OTHER LANDS.

In the neighbourhood of the Dead Sea I might mention the district long known as Syria Sobal, which commemorates the second of the Horite dukes.[4*] Among his sons, Manahath gives name to a place spoken of in the 6th verse of the 8th chapter of first Chronicles, the site of which is unknown. It may have been Minois, near Gaza in Philistia, or, as probably, the Mendesian nome of Lower Egypt. As for Ebal, the third son of Shobal, a mountain in Central Palestine bears his name; and the region of Gebalitis in the vicinity of, or included in, Syria Sobal, shows the simple conversion of an initial Ayin, represented falsely in our English version as an unaspirated letter, into a corresponding Gimel. The root Shepho is so common a one that I hardly dare trust myself to point out its geographical connections. Onam will be seen by any one capable of consulting a Hebrew lexicon to be of the same root as that which occurs in Ono, a town of Benjamin, and On, the celebrated city of the Sun, in Egypt. Bethana is the house of the god Anah, also called Anammelech or Anah the king. Among the sons of Dishon, I need only select Eshban, a word which Gesenius identifies with

[4] Homeri Iliad. ii. 851-2. The same Eneti introduced mules into Spain. They are the Anites descended from the son of Zibeon.

[4*] Ritter's Comparative Geography of Palestine, Edin., ii. 134. Keil and Delitsch (in Gen. xxxvi.), good men but typical commentators of the unhistorical class, sneer at the idea of a connection between Syria Sobal and Shobal the Horite. The name appears indeed in an apocryphal book, but is no more an apocryphal name than Gebalitis.

Heshbon in Moab.[5] Among those of Ezar, Akan, or, as he is called in 1 Chronicles i. 42, Jakan, gives us the important family of the Beni Jaakan, dwelling in Arabia Petræa (Numbers xxxiii. 31). Of the sons of Dishan, Uz appears to have been the first or most important settler in the land of which the patriarch Job was an inhabitant.

Dr. Hyde Clarke has already shown in several of his admirable papers, that the geographical names of Palestine are those of the world.[6] The majority of these names I have good reason to believe are eponymous. The Horites, who left little or no traces in Palestine, on account of their early emigration to other lands, did not, on that account, suffer their names to perish, but still "called their lands by their own names" in whatever part of the world these were situated. Latopolis in Egypt and Latium in Italy represent Lotan. Hori gives Heroopolis, also in the land of the Pharaohs, and unnumbered similar designations of towns in Europe, Asia, and Africa. Shobal appears in the Lydian Sipylus and in the great Sabellian family of Italy. Alvan, or, as he is called in 1 Chron. i. 40, Alian, furnishes the Egyptian Ilshoun, and the famous city Ilium of the Troade. Manahath is the founder of Mendes, and Mandara or Month-ra, and also had his name conferred upon Monetium of the Japodes, like the Eneti, an Illyrian people.[6*] Ebal, in the form of Gebal, appears in Phœnicia, and the character of the initial sound is at once seen in the form Byblus, which consists in the prefix of the Coptic article. Onam we have already connected with On or Heliopolis in Egypt. The Colchian city Æa may be a reminiscence of Ajah, while Anah is almost proved to be the progenitor of the Eneti by the fact that their ancestor in the Welsh mythical history is Gwynn, a word which reproduces the power of the initial Ayin of the Hebrew name.[7] The sons of Dishon seem to have sent colonies to Persia, for Hamadan, Ispahan and Teheran are too near Hemdan, Eshban and Ithran to be accidental. In Eshban we also find Hispania, while Ithran and Tyrrhenia agree. As for Cheran, no form is more common in universal geography. Aziris in Libya, and

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[5] Gesenii Lexicon *in loc.*

[6] I beg here to express my public acknowledgment of Dr. Clarke's valuable suggestions in connection with the special subject of this division of the paper; although the field to which I have confined my attention principally is geographically, and perhaps chronologically, different from that in which he has pursued his important investigations.

[6*] We find Soba, Alva and Mandara in close proximity. Lepsius' Letters, 163.

[7] Davies' Celtic Researches, 167.

many similar names in Syria and Asia Minor, remind us of Ezer. Like correspondences are found with the remaining eponyms of the Horite family. The question has often been asked, Whence came the Phœnicians, that ancient and distinguished people? Herodotus and other writers tell us that their own account brought them from the shores of the Red Sea.[7]* Now, on these shores we find the Beni-Jaakan of the sons of Ezer, and this compound word, not the Beni-Anakim of Bochart, is the original of the national designation. Phœnician.[8] It may seem that thus I reduce all the civilized peoples of the world to one ancestry, and represent the Horites as the one people of antiquity, in the same way as older writers have dealt with their Arkites, Atlantides, Cushites, &c. This, however, is not the case. There are, at least, six other families of little less importance, and many more which contributed largely to early civilization, that I hope in time to bring under the notice of the student of ancient history.[9] That we find the Horites, or reminiscences of them, in nearly every country need not be matter of surprise, for what has been often remarked in regard to the mixture of peoples in the populations of Greece and India is true of almost every land possessing a history. There is no such thing as a pure civilized race.

III.—ONE FAMILY OF THE HORITES APPEARS, IN A SOMEWHAT DISGUISED FORM, IN THE SECOND AND FOURTH CHAPTERS OF THE FIRST BOOK OF CHRONICLES, AND THERE FURNISHES THE LINK OF CONNECTION WITH OTHER HISTORIES THAN THAT OF THE BIBLE.

A serious objection assails me upon the threshold of proof. It is this. The second chapter, and part of the fourth, of the first book of Chronicles profess to contain the genealogies of the sons of Judah. Under what pretence, then, can I introduce the Horites? I answer, upon several good grounds. In the first place, mention is made in these genealogies of men who certainly were not Jews. Such (1 Ch. ii. 55) are the Kenites, that came of Hemath, the father of the house of Rechab, a line mentioned in the second verse of the 35th chapter of Jeremiah. Such, also, are the Kenezites, first mentioned in the 19th verse of the 15th chapter of Genesis, and to whom Caleb, the son of Jephunneh (Numbers xxxii. 12, Joshua xiv. 6), is said to have

[7]* Herodot. vii. 89. Strabonis Geog., 766.

[8] Bochart, Canaan i. i. 347.

[9] Such are the sons of Salma and Hareph (1 Chron. ii. 51, 54), the Jerahmeelites (ii. 25), the children of Etam (iv. 3), of Ashchur (iv. 5), of Coz (iv. 8), of Kenaz (iv. 13), of Ezra (iv. 17), &c.

belonged. Their genealogy is given, 1 Chron. iv. 13, &c. In the ninth verse of the same chapter, Jabez is more honourable than his brethren, because he called on the God of Israel, not, we may conclude, on his own gods, as his brethren were in the habit of doing. Jabez was no Israelite. In the eighteenth verse, a daughter of Pharaoh marries Mered (literally the rebel), a most unlikely name for a descendant of Judah. He is doubtless prince Mourhet, who is said to have married a daughter of Cheops, and whose features, as represented on the Egyptian monuments, are not at all Jewish.[10] In the 19th verse, we read of Eshtemoa, the Maachathite; but the Maachathites (Deut. iii. 13, 2 Sam. x. 6), were, with the Geshurites, an independent people, who at times warred with the Israelites. Who can throw light upon the "ancient things" of verses 21-3? With what king of Israel do those, who had dominion in Moab, connect as his servants?

The names of the supposed descendants of Judah are not Jewish. What Jew would call his son Caleb (a dog), a name which so frequently occurs and in the greatest confusion? The family mentioned in chapter ii. 43-45, is from its names clearly Midianite, and two of the names in chapter iv. 25, are Ishmaelite. The second chapter, as far as the 17th verse, seems to contain, with a few interpolations, a record of the children of Judah; the whole of the third is taken up with the family of David; but I have no evidence, beyond the words of the first verse of the fourth chapter, "The sons of Judah; Pharez, Hezron, and Carmi, and Hur, and Shobal," that the families mentioned in it were Israelites in any sense of the term. The 23rd chapter of second Samuel, and the 11th chapter of the book we are considering, shed some light upon the nationality of those mentioned in its second and fourth chapters. In the 54th verse of the second chapter, the Netophathites are mentioned, and the Ithrites in the 53rd verse, while the head of Tekoa appears in the fifth of the fourth chapter, and a Maachathite in the nineteenth. Now, in the chapters above mentioned (2 Sam. xxiii., and 1 Chron. xi.), we find Maharai and Heleb, Netophathites, Ira and Gareb, Ithrites, Eliphelet, the Maachathite, and another Ira, a Tekoite. I might also compare Hushah, the son of Ezer (1 Chron. iv. 4), with (2 Sam. xxiii. 27 and 1 Chron. xi. 29), Mebunnai and Sibbecai, the Hushathites. It may be said that these are still Israelites, taking their

[10] Nott and Gliddon in their joint ethnological work, p. 177. Osburn, Monumental History of Egypt, i. 454, seq. Lepsius' Letters, 61.

names from the towns they inhabited. If so, why is Ittai (2 Sam. xxiii. 29) called a Benjamite, Bani (2 Sam. xxiii. 36) a Gadite, and Adina (1 Chron. xi. 42) a Reubenite? It cannot be said that Zelek, the Ammonite, Ithmah, the Moabite, Nahari, the Beerothite, and Uriah, the Hittite, who are mentioned (2 Sam. xxiii. 37, 39, 1 Chron. xi. 46) together with them, are Israelites. There is more historic truth than men are aware of in the words of the Apostle Paul, "For they are not all Israel which are of Israel." It is plain, not only that many had, like Caleb, part and lot with Israel in the land of promise who were not descendants of Abraham, but that the kingdom of Israel, in the time of David, consisted of a number of different nationalities. The line of Jerahmeel, which is given in 1 Chron. ii. 25-41, is not an Abrahamic family, although I do not deny that there may have been a Jerahmeel in the line of Judah. We meet with these Jerahmeelites in 1 Sam. xxvii. 10, where David is represented as telling Achish that he had made a road against the south of Judah, and against the south of the Jerahmeelites, and against the south of the Kenites, as if they were three distinct peoples. Also, in the 30th chapter, the Jerahmeelites and the Kenites are spoken of as dwelling in cities, while the same is not said of any of his confederates and friends to whom David sent presents. In connection with this passage, as showing the position of Caleb the Kenezite, we find (verse 14) the Egyptian slave deserted by the Amalekites saying, "We made an invasion upon the south of the Cherethites, and upon the coast which belongeth to Judah, and upon the south of Caleb." The Cherethites have been clearly shewn, and are now generally allowed to have been, Cretans; and Caleb's descendants are no less thoroughly distinguished from the people of Judah than are these Japhetic warriors.

I might dwell upon the antiquity of Bethlehem Ephratah, which (1 Chron. ii. 19, 24, 50) derives its name from Ephrath, the wife of Caleb, the father or son of Hur, for there is contradiction here; an antiquity which is well shewn (Gen. xxxv. 16, 19) by its possessing that name in the time of Jacob. Yet Caleb is the great-grandson of Judah by a very late connection. It is somewhat strange that none of the great names of these genealogies, if we except the immediate descendants of Judah, and Caleb the son of Jephunneh, ever appear in any other part of the Bible. With the exception of the ancestors of David, and the families of the Levites in the sixth chapter, the

lists are utterly useless for genealogical purposes; and we have no record that the twelve tribes ever employed them for such an end, or even that the most learned of their rabbis have been able to reduce them to order. It is utterly impossible to reduce them to order, on the hypothesis or understanding that they represent the descendants of Judah, Benjamin, &c. The Ram and Hur and Salma of Judah cannot be reconciled with those of the same name afterward mentioned; neither can the Beni-Jamin of the seventh chapter be made to agree with the *children of Jacob's youngest born*. What, then, it may be asked, is the alternative? The books of Chronicles are of low canonicity—for the Jew places them at the end of the hagiographa. Shall they be deemed unworthy of the canon? Far from it. I regard the first book of Chronicles as one of the most valuable books in the Old Testament Scriptures. It contains what is found in no other book in the world, a brief but most comprehensive record of all the great families of antiquity. It embraces a large Gentile genealogy, or series of genealogies, overshadowing those of the Hebrew people; and this accounts for the mystification of all the Jewish doctors. They never thought of looking in the inspired writings of their canon for a sign of the Divine interest in all the nations of the earth, beyond that furnished in the tenth chapter of Genesis.

The books of Chronicles are among the least edited, even at the present day, of all the books of the Bible. The versions of these books differ widely, to an extravagant degree, in the names given in the first few chapters of the first book and in other particulars.[n] It may yet be found by scholars possessing greater Oriental erudition and greater facilities than I can command, that the connection of the sons of Jacob with these Gentile families is the result of ancient rabbinical interpolation; and that a well meant, but injudicious attempt to clear up a mystery has led to the serious confusion that so frequently appears. I may state here, once for all, that nothing short of the most serious and long settled conviction of the truth and important reality of my discovery could induce me to cast a doubt upon the presently received views in regard to this portion of the Sacred Volume. With the Apostle Paul I trust ever to be able to take as my motto, "We can do nothing against the truth, but for the truth," meaning by that Truth the inspired Word of God,

[n] *E.g.*, The Septuagint and Syriac versions.

whether that inspiration regard matter of doctrine or of history. In the meanwhile, I assume the correctness of our present Hebrew version of the first book of Chronicles, and, to account for the presence of the Gentile names which I find in the first few chapters, suggest the following hypotheses:

1. *Together with the descendants of the sons of Jacob, there may have been included in the lists their connections by marriage.*—This, except in the case of Bithiah the daughter of Pharaoh, and the Kenites (Judges iv. 11). who should have been numbered among the descendants of Levi rather than of Judah, I cannot perceive.

2. *Or, together with them, there may have been included a mixed multitude of other races that had suffered oppression along with them in Egypt, and had part in their deliverance.*—This might help to satisfy Dr. Colenso's doubts, and is true in so far as the Kenites and some of the Kenezites are concerned. It must, however, make the list retrospective, giving the ancestors of these fugitives back to or beyond the time of Abraham. Even thus, my investigations have shewn me that it will not account for all the lines mentioned, many of whom had little or no late connection with Palestine.

3. *Or—and this I think is the truth—Southern Palestine was the great centre of a later dispersion than that of Babel, being the highway to Egypt and Arabia, Syria, and Asia Minor; and the Mosaic narrative, looking rather to geographical than tribal descent, gives here the eponyms of the various states and cities into the possession of which Israel entered.*—There is a significance which we do not yet understand in the words of Moses (Deut. xxxii. 7, 8), "Remember the days of old, consider the years of many generations; ask thy father and he will shew thee; thy elders and they will tell thee. When the Most High divided to the nations their inheritance, when he separated the sons of Adam, he set the bounds of the people according to the number of the children of Israel." This hypothesis will account for the immense disproportion between the number of the descendants of Judah and those of the other tribes supposed to be placed on record in these chapters, since they occupied the larger portion of Southern Palestine; although it is true (Numbers i. 27) that the children of Judah were more numerous than those of any other of the sons of Jacob. I now proceed to find among the names connected with the mention of this tribe one of the families of the

Horites, whose position geographically would bring them, if my hypothesis be correct, within its limits.

The only Shobal mentioned in the Bible, apart from the families of the Horites, is one that appears in 1 Chron. ii. 50, 52, and iv. 1, 2. The verses are, "These are the sons of Caleb the son of Hur (called also, 1 Chron. ii. 19, the father of Hur), the first-born of Ephratah; Shobal, the father of Kirjath-jearim. And Shobal, the father of Kirjath-jearim, had sons; Haroeh and half of the Manahethites. The sons of Judah; Pharez, Hezron, and Carmi and Hur and Shobal. And Reaiah (or Haroeh) the son of Shobal begat Jahath; and Jahath begat Ahumai and Lahad. These are the families of the Zorathites." Among the families of Kirjath-jearim are mentioned, in the 53rd verse of the second chapter, the Zareathites, whom a glance at the Hebrew text will show to be the same as the so-called Zorathites. The name Hur is identical with the root of the word Horite. As for Caleb he is ubiquitous throughout the second chapter, and his name is, from its meaning, clearly Gentile. Be this as it may, we have a Shobal, itself not an Israelitish name, in connection with other Gentile appellations, and notably with a Hur, who is not the father of Uri, of whom came the wise Bezaleel (1 Chron. ii. 20, Exodus xxxi. 2), and whose name agrees with the Horite parentage of another Shobal, frequently mentioned. He is the father of Kirjath-jearim. Now Kirjath-jearim (Joshua ix. 17) was a city of the Gibeonites, and continued to be so, for the Gibeonites made peace with Israel by artifice. But these Gibeonites were Hivites (Joshua ix. 7, xi. 19), and so also are the Horites called (Gen. xxxvi. 2.) The name Hivite, I am convinced, does not designate Hamitic or any other kind of descent; nevertheless it forms a link to bind Kirjath-jearim and the Horite stock. More important is the fact that the second son of Shobal, the Horite, and of that Shobal who is mentioned in the book of Chronicles, is Manahath, a name unknown in the annals of Israel. Hur, Shobal, and Manahath, form already a threefold cord for the Horite connection. A difficulty appears, however, in the eldest son of the Shobal of Chronicles, who is Ha (the definite article) Roeh or Reaiah, as contrasted with the Alvan or Alian of the Horite. I confess that this staggered me for a time, but disappeared as soon as I began to investigate the meaning of the two words. The name Alvan or Alian is a somewhat Punic form of the word *Elioun*, *the most high*, and corresponds with the

Arabic *Galyan* (for its initial letter is ayin), meaning *of lofty stature.*[11]* The Punic form appears in the "*Alonim* v '*Alonuth*" *of* the Pœnulus of Plautus, designating the gods and goddesses.[12] I must here anticipate by introducing the authority of the Phœnician History of Sanchoniatho, which deals with the region about the Dead Sea, Peræa being a primitive seat.[13] He gives, indeed, an older divinity, *Elioun*, whom he makes the husband of Beruth, a kind of Aphrodite or Ephrath, and who would correspond with the father of Hur; but he has a later divinity (no divinity with him however), who in the Greek translation is termed Ilus or Cronus and whose brothers are Betylus, Dagon, and Atlas. Now, Betylus is probably Bethlehem, closely connected with this family, rather than Bethel, as many, like Bishop Cumberland, have supposed. Dagon I shall yet prove to be Onam. As for Atlas, he does not belong to this line at all, but to that of Jerahmeel. The important part of the name Alvan or Alian is the initial Al. The final *n* is valueless, for duke Aliah of the Edomites is clearly of the same name. The *yod* and *vav* are, as we see above, interchangeable; so that the Al remains, denoting in Hebrew and other Shemitic tongues, without any assistance of additional letters, *the Most High, God.* This is the Ilus of Sanchoniatho, who appears along with Dagon on many sculptured walls of Chaldea. He is there called Il, and is the highest of the Babylonian divinities. It is in the Chaldean mythology that we are furnished with the materials for identifying Alvan and Reaiah. Il or Ra, Sir Henry Rawlinson and many other students of Oriental monuments and inscriptions inform us, is the great god of Babylonia.[14] This Ra is an Egyptian term originally, and denotes the sun in the ancient Coptic of the hieroglyphics. The word Roeh or Haroeh divested of the definite article, denotes, according to Gesenius, vision, the sight of the sun; and a corresponding Coptic word connecting with Ra is Ro, the face. But Fuerst, with his usual wisdom, renders Roeh, the All-seeing One, that is, God. Reaiah seems to me an attempt to provide a Hebrew

11* For this meaning of the name Alvan I have confirmation in the high authority of Fuerst. That judicious lexicographer finds in the word *a high, sublime* one, and makes it, as I have done, the same as El and Elioun. Fuerst's Hebrew and Chaldee Lexicon in *loc.*

12 Plauti Poenuli, v. 1.

13 Sanchoniatho's Phœnician History, by Cumberland, 197.

14 Rawlinson's Herodotus, App., Bk. i, Essay x., s. 2, (i.) &c. Both Ra and Il as convertible terms signified "a god" in general, and this agrees with Fuerst's translations of Alvan and Roeh. See below in the text.

name for the son of Shobal, for Gesenius makes it to mean "whom Jehovah cares for," admitting, however, that Haroeh designates the same person. We have in Alvan and Reaiah two words denoting supreme deity. I would only present one additional proof, at this stage, of the identity of Alvan and Reaiah, Il and Ra. It is found in connection with the history of Sanchoniatho. Jehid or Jeoud is named as the son of Ilus, whom he sacrificed to his father Ouranos. Rightly the son of Reaiah bears the corresponding name Jahath. All that I demand at present is a belief in the probability that the Horite Shobal, with his sons Alvan and Manahath, is the same as the Shobal, son of Hur, whose children are Roeh and Manahath. The identification of the Ilus and the Jehid of Sanchoniatho with the Roeh or Reaiah and Jahath of Chronicles is important but not absolutely necessary for the burden of proof.

IV.—IN THIS FAMILY (THAT OF SHOBAL) WE FIND MANY OF THE DIVINITIES AND SOME OF THE EARLIEST RULERS OF LOWER AND UPPER EGYPT.

It is now, I think, generally conceded that the earliest population of Egypt entered from the north-east, and must, therefore, if it came by land, as is most likely, have passed through the country of the Horites, and have dwelt for a time, probably, in the south-western corner of Palestine, about the kingdom of Gerar, visited by Abraham and Isaac, but of which we hear nothing in later times. The Scriptures call Egypt Mizraim, and we are therefore justified in believing that the son of Ham of that name was one of the earliest settlers in the land. But it is to be remarked that no race, royal or princely, in Egypt, ever claimed descent from this ancestor. The connection of Mizraim with Menes and others is sheer unfounded hypothesis, and I shall yet show that *Chemi*, a name of this ancient country, bears no reference, as it is often supposed to do, to Ham himself. My own impression, I do not say decided conviction, is that the Hamites, if they exercised sovereign authority at all, did so for a very short time and during a period which is unhistorical, after which they became the subjects of a superior race. Many writers, with Shuckford, have supposed the Horites to be the invaders of Egypt, known as the Shepherd Kings.[15] That they did invade Egypt can be clearly proved, but it was at an earlier period than that of the

[15] Shuckford's Connection of Sacred and Profane History. Original edition, ii. 236.

Hycsos, for the dynasty which these invaders overthrew was Horite. It is worthy of note that among the many races with whom the conquering Pharaohs are said to have warred, and whose names are recorded on various monuments, the Horites never appear.

One of the earliest names of Egypt is Aeria. The Rev. W. B. Galloway, to whom I am indebted for many valuable suggestions, both from personal communications and from his published opinions, together with other writers, connects this name with the AURITAE of the Old Chronicle.[16] These Auritae are given as the first great race of Egypt, including gods, demi-gods, and men.[17] Their gods, indeed, the Egyptians allowed to have been but deified men.[18] These Auritae are the Hor Shesu, servants of Horus or families of the Horites, of the monuments and papyri.[19] I need not tell any student of Egyptian antiquities that Horus is the greatest of all names in the Egyptian mythology. It is an aspirated word, having the form Choris, shewing the power of the Hebrew Cheth, and appears frequently as a termination to the names of many kings, Nephercheres, Tancheres, Zebercheres, &c. In this family several of the principal gods of the Egyptians are to be found. We shall not find Osiris here, nor his near relation Atmoo; these belong to the family of Etam. Neither will Ammon and his son Khensu meet us; these are later, and connect with the son of Lot. The purely solar divinities, the centre of whom is Ra, the sun, are the representatives of the family of Shobal.

The first to engage our attention is the ancestor of the gods of the Auritae. His name is Seb, Sebek, or Seb-ra, and he is Cronus or Time. In him we find the Shobal of Mount Seir. As the Al of Alvan becomes the Ra of Chronicles, so the final *al* of Shobal, although a different syllable, is represented by the *ra* which is affixed

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16 Egypt's Record of Time to the Exodus of Israel, 136. Mr. Galloway while rightly connecting Aeria and the Auritæ, as Kenrick and many others have done, puts a most just and reasonable faith in the antiquity of both words, in which these writers do not generally agree with him While agreeing fully with Mr. Galloway in his derivation of the Assyrian line from Egypt and identification of Sesostris with Xisuthrus, I regret that I cannot find with him the word Athyrian or Assyrian in Aeria. The Assyrian line is that of Asshur or Ashcur, whose son Achashtari is Sesostris and Xisuthrus. This line was from an early period inimical to the Horites.

17 Old Egyptian Chronicle in Cory's Ancient Fragments. There can be no reason for rejecting the name Auritae more than for discarding the two other designations, Mestraei and Aegyptl, to which no exception is taken.

18 This is stated by Diodorus Siculus and others. All the Pharaohs when dead became gods. Lenormant and Chevalier, i. 294.

19 Lenormant and Chevalier, Manual of the Ancient History of the East, i. 202.

to the name of the Egyptian god. The son of Seb is Ra, the sun, and in him we have the Il or Ra of the Babylonians, and the Alvan or Reaiah of the sacred narrative. A brother of Ra is the deity Month or Month-ra. I am indebted to Mr. Osburn for a confirmation of my identification of the name Manahath with that of this god.[20] Still another is An-ra, connected with On or Heliopolis, and he is Onam, the youngest or last mentioned of the Shobalian brethren. Fuerst points out that the *m* of Onam is a noun termination common among the Edomites. Jahath, or as we may also read it, allowing for the power of the medial Cheth, Jachath, appears in subjection to these, and among the descendants of Seb, as Ati-ra or Achthoes-ra, a name we are yet to become more familiar with. Lower still in order, yet not in point of dignity and importance, is Ahom-ra, and he is the Ahumai who appears as the eldest son of Jahath. Two goddesses connect with this remarkable line. One is Neith, whose name, meaning *to level a bow*, is identical with the Hebrew Nahath, which is the same as Manahath, without the prefixed *Mem*. The other is Hekt, which is simply an abbreviated form of Jachath, the initial *yod* being converted into a breathing.

Some of these divinities were rulers in Egypt. As for Seb or Shobal and Ra or Alvan, we have no evidence that they ever exercised sovereignty in that land. Alvan, whom we have seen to be in all probability the Ilus of Sanchoniatho, ruled, I am persuaded, in the south of Palestine, whence his more adventurous brother Manahath pushed on into Egypt, probably taking with him Onam and Jahath the son of Alvan. I shall yet give good reasons for limiting Alvan to Palestine, and making a probable connection for him with the Abimelechs of Gerar. The region chosen by Manahath for his settlement was Tanis or Zoan in the north-east of the land of Egypt, a city built seven years before Hebron in Palestine. It may have been built at that time by Manahath himself, but this I think hardly probable. Close at hand is Mendes giving its name to the Mendesian nome. This Mendes is the city of Month, who is Manahath; and Manahath himself is the first ruler of the Egyptians, the great Menes, whose name and fame descended to all lands as Menu, Minos, Mannus, Manes, Menw, Mingti, and even it may be the Algonquin Manitou. The first ruler of Egypt, and the first lawgiver among all peoples who ever pretended to the benefits of Egypt's early civilization, is the second son of Shobal the Horite.

[20] Monumental History of Egypt, i. 341.

A little later than Manahath we find Onam. Not contented to share his brother's empire or to occupy the position of a subject, he turned southward, and, a little below the point of divergence of the Nile's various branches, founded a town, which he named after himself, On, the strong city of the Sun, also called An-ra. There he kept regal state for some years, until a new invasion drove him from the throne; and his descendants the Anu, after threatening Egypt for a time from the coasts of Arabia Petraea, withdrew at last to Chaldea.[21] On the lists he appears as Onnos; but his name as found upon the monuments is An, represented by the figure of a fish.[22] There can be no doubt that he is the Babylonian Oannes or Dagon, so intimately connected with Ilus, none other than his oldest brother Alvan.[23]

I cannot tell precisely at what period Jahath or Jachath, the son of Alvan or Reaiah, began his unhappy reign, whether during the life of his uncle Manahath or after his death. He is Achthoes, the cruel king of Heracleopolis, who was killed by his guards and Hercules, according to the lists. There are or were at least three towns in Egypt called Heracleopolis, two of which were in the Delta, one at its eastern and the other at its western extremity, while the third was situated on the left side of the Nile below Lake Moeris. It is probable that Achthoes inhabited and ruled over the town to the east of the Delta, not far from the dominions of his father Alvan on the one hand and those of his uncle Manahath on the other. He is fully identified with the solar line of Seb,[24] and his name is read Ati on the monuments, where he is also represented as a monarch cut off in the flower of his age. This may agree with the statement of Sanchoniatho as to the unhappy fate of Jehid or Jeoud, the son of Ilus. This Jachath or Achthoes was confederate with Nesteres, the son of Usecheres, whom I will yet show to be Ha (the definite article) Ahashtari the son of Ashchur (or as our English version of the Bible erroneously reads Asshur), a great name in a distinguished family, the Ashtar of the Shepherd Kings.[25] He, however, is no Horite, and for the present must be dismissed. Nesteres or Ahashtari and Achthoes together made war upon Onam or Onnos, the

[21] Lenormant and Chevalier, i. 295, n. 359.

[22] Osburn, i. 311.

[23] Bonomi, Nineveh and its Palaces, 330, quotes some valuable remarks of Miss Fanny Corbeaux, connecting On and Dagon.

[24] Osburn, i. 373.

[25] Id., ii. 522.

uncle of the latter, and the conclusion of the war was a treaty, one of the provisions of which was the marriage of a daughter of Onnos to Achthoes, who was thus united to his cousin. Achthoes holds a high position among the Pharaohs, and spite of his traditional cruelty and unhappy end, is frequently referred to by later monarchs, who trace their descent from the Horites of the line of Seb.[25*]

The death of Achthoes or Jachath and the Shepherd invasion, which is really the period of the supremacy of Ashtari and his family, were coincident. The line of Seb, or, as he is at times called, Sebek, just as Sibulla gives Spica, was driven out of Lower Egypt, and had to take refuge at Coptos.[26] There dwelt the descendants of Achthoes, the children of Seb, the worshippers of Horus, the religious faction or party known as the Mentcherian (Month-Hor). The head of this Upper Egyptian monarchy was the son of Ati or Achthoes, whose name on the monuments and in the lists varies between Ahmes and Kames. In Kames, the initial vowel is wanting, and its absence brings out the full power of the Hebrew Cheth of Achumai. He is also the head of the family, which, gathering strength in the south, rose at length in rebellion against the Shethite power, and reasserted the dignity of the line of Horus. His brother Lahad I have not yet identified. I am not satisfied that he is Alites or Salatis; yet Lud, an ancient name of the Egyptians, seems to connect with him. There are links to bind the stock of Jahath to Lower as well as to Upper Egypt at this period, and it is possible that Lahad may have taken part in his brother's expulsion. With Newton, however, "hypotheses non fingo."

It is interesting to note the date of this division of the Egyptian empire, as it is afforded us by the statements of Scripture. We may conclude that Shobal and Zibeon were contemporaries, Shobal, if anything, being a little earlier than his brother.

Seir or Hur.

Shobal.	Zibeon.	Abraham.	
Alvan or Reaiah.	Anah.	Isaac.	
Jahath.	Aholibamah—Esau.		Jacob.
Ahumai.			Joseph.

[25*] For the connection of Seb, Achthoes, Mencheres, and Onnos, see Osburn, i. 373, &c.
[26] Osburn, ii. 64, &c.

According to the above table, Ahumai and the patriarch Joseph are contemporaries, so that Joseph appears properly in Egypt during the period of the so-called Shepherd Kings. This agrees with the almost universal tradition that he lived and ruled under Apophis, the greatest of that line.[27] As Apophis, however, was not the first of his dynasty in order of reigning, I am disposed to throw Shobal a little farther, say half a generation, back into the past. With the line that displaced the Horites we have, at present, nothing to do. At their head stands the family of Ashchur, or as he is generally called Usecheres, and, as the central figure in their family, Achashtari, who is at once Ashtar and Sesostris. It was he who overthrew the Horite power in Lower Egypt, and who, once an ally of Achthoes, became the Sheth that stands ever after as the enemy of Horus and all his race. These identifications are given in few words, but are the results of many labours and much patient investigation. They are clearly established in my own mind, and abundance of proof for them will emerge both in this paper and in future accounts of other great families of antiquity. I am convinced that no intelligent Egyptologist will lightly pass by what he must regard, at the least, as a series of extraordinary coincidences, unparalleled in the connections of Sacred and Profane History.

V.—From this family of Shobal, in the line of Ra or Alvan, came the Caphtorim who invaded Palestine before the close of the wanderings of Israel.

Before proceeding with the proof of this statement in itself, I may be allowed to dwell for a short time upon the fact that the southern dynasty founded by Ahumai or Achumai, as Ahmes or Kames, is the dynasty of Syncellus, called that of the Aegypti. Syncellus and other sources of Egyptian history give us three dynasties of rulers in the land of the Pharaohs, the Auritae, whose history we have considered, the Mestraei, and the Aegypti.[28] The Mestraei are the Shethites of Ahashtari, who is called Nesteres by decipherers of the monumental records. The Aegypti are the revived Horite line under Ahumai, who is himself Aegyptus. I proceed to the proof, and in giving it will anticipate somewhat by introducing etymological and historical illustrations from other languages and mythical histories.

[27] Lepsius' Letters, 480, 487.

[28] Vide Cory's Ancient Fragments.

The region in which the Horite family in the line of Ahumai or Ahmes took refuge, and in which it exercised regal dominion, was that of Coptos. This word has been generally and rightly supposed to be the root of the name Ægypt, the Egyptians themselves being known as Copts. We learn, however, that the ancient name of Coptos was Chemmis, and this Chemmis, the abode of the god Khem or Ahom, gives us as its eponym Kames or Ahmes, otherwise Ahumai. The ancient name of Egypt, as a whole, was Chemi, the land of this same founder of Chemmis. The word Chemi, in ancient and modern Coptic, conveys the two ideas of heat and blackness. Similar roots with the same double meaning are found in Arabic, Syriac, and Hebrew. The Hebrew word Chum is proposed by Fuerst as the root of Achumai, the initial Aleph being prosthetic. It is interesting to note that the symbol of Ahom is the vulture or eagle, and Gyps, the black vulture, has often been supposed a part of the name Aegypt, while the word Ahom represents it. It is also worthy of remark that another name for the Cheops of Herodotus is Chembes or Chemmis.[29] For a similar transformation, I may instance the Latin Cupid as the homonym of the Sanscrit Cama. We have thus five pairs of words serving to illustrate the identity of Ahumai and Ægyptus:

Coptos.	Ægypt.	Cheops.	Gypt.	Cupid.
Chemmis.	Chemi.	Chemmis.	Ahom.	Cama.

In proceeding to identify these two names, I need hardly apologize for introducing Persian connections. I have already pointed out what Herodotus, Diodorus, and other Greek writers so plainly state, that from Chemmis came Ægyptus, Danaus and Perseus, their descendant, the head of the Persian line.[30] Nor are confirmations of these statements wanting. A simple method of proof, allowing the possibility of a Persian connection, lies in an enquiry into the Bible relations of the name Achumai. The nearest word to Achumai is Achmetha, the name of a city mentioned in Ezra vi. 2. The final *tha*, which distinguishes this word from Achumai, is a particle denoting place in many languages. In Hebrew we find Helek, Atarah, Maarah becoming Helkath, Ataroth, Maarath, while Aiath, Kehelatha, Zeredatha, and similar words testify to the same. We

[29] Diod. Sic., i. 63.

[30] The Pharaoh of the Exodus. *Canadian Journal*, Vol. xiii., No. 1.

find it also in the change of the word Chem to Copt. Chemt is almost unpronounceable, and would soon become Chebt. To return, however, to Achmetha. Our English version of Ezra, perfectly trustworthy here, renders it as Ecbatana, but places in the margin, the conjectural reading, "in a coffer or chest." The Greek equivalent of the Aramaic Achmetha, Hebrew Chemeth, a *coffer*, is Kibotos, and that is the name of the ark in which the scattered limbs of Osiris, which were brought to Chemmis, or Coptos, were placed. The words Achmetha and Ecbatana are really the same, in spite of the vast difference of their appearance. The change of an *m* into a *b* (one of the commonest of all changes in etymology), and the affix of another Persian particle denoting a place *(ana)*, account for the variation. Ecbatana, however, in Persian is *Hagmatan*, and is the town of the Persian Achaemenes or Djemschid,[31] the great solar hero, whom Guigniaut and others have identified with the Ahom or Khem of the Egyptians.[32] The sawing of Djemschid in two simply represents the division of the Egyptian Empire in his reign. Whether we translate Achmetha as Ecbatana or Kibotos, we still find an Ægyptus in our Achumai, and in the former case identify him with the head of the Achaemenian Persians. We do not wonder that Cambyses, when in Egypt, claimed to be descended from its ancient kings, and those of a Horite stock.[33]

Sir Gardner Wilkinson settles at once, in few words, the question which has vexed many students of Biblical antiquities—"Whence came the Caphtorim?" The majority of writers, like Hitzig, have taxed their ingenuity to bring them from Crete along with the Cherethites. Now the Cherethites of Palestine never saw Crete. It was doubtless a late stage of their progress that brought a handful of them to that island. Some of the Caphtorim formed part of that migration. But these matters do not concern us at present. One of the names of Coptos, as Sir Gardner Wilkinson has shewn, is Kebt-Hor, a form like Ahom-ra.[34] It was the Coptos of the Horites. Kebt-Hor is the Caphtor of the Bible, and the earliest city of that

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[31] Rawlinson's Herodotus, Book i., Ch. 98, Note 2. See also Book iii., Ch. 30, Note 6. The Persian B, for which the Greeks had no real equivalent, their own B having the sound of V, was replaced naturally enough by the labial most akin to it, M.

[32] Guigniaut, ii. 116, 169.

[33] Lenormant and Chevallier, ii. 97.

[34] Rawlinson's Herodotus, Book ii., Ch. 15, Note 5. Also App., Book ii., Ch. 8, (15th, 16th, and 17th dynasties) Note.

name. From it came the Caphtorim, whom the Scriptures, without the slightest ambiguity, derive from Egypt.[35] The Caphtorim invaded Palestine before the Israelites entered the land, yet, strange to say, we read of no settlements of this people, nor are they spoken of as a nation at the time of Israel's occupation.

The genealogy of the sons of Shobal says nothing of the Caphtorim; but it mentions that Achumai, and perhaps Lahad, were the heads of the families of the Zorathites, whom we have found to be the same as the Zareathites. The root of this name is Zirah, *the hornet;* on this point there is and can be no doubt. An Egyptian traveller in Palestine speaks of a town called Zorah, *a place of hornets*, concerning which he says that the inhabitants were hornets by name and by nature.[36] The Zirah or hornet (Exodus xxiii. 28, Deut. vii. 20, Joshua xxiv. 12,) whom God by the lips of Moses promised to send before his people to drive out the Hivite, the Canaanite, and the Hittite, was no valiant insect even in countless swarms, but a race of men of high lineage and great martial prowess, the descendants of Shobal the Horite, and the Caphtorim, who took their name from Shobal's great grandson, Achumai. It would be strange indeed if any insect pest, according to the ordinary laws of nature and the Divine working, should force great nations out of cities walled up to heaven. Neither did the Israelites find in Palestine a deserted land, but one full of towns, well peopled, and great armies, weakened doubtless, but not destroyed, by the hornet invasion. In Dor and Endor, and many neighbouring places, these Zorathites (for they are the Dorians, and Palestine their Peloponnesus—the home of their fathers which they returned to conquer—as Mazocchi shrewdly guesses),[37] long maintained their independence, and in time passed on to other lands, to be numbered among the most warlike of the peoples of the earth. We may now see a reason for the mention of apparently minute particulars regarding this branch of the human family in the Book of Chronicles. I may add that the hornet appears on the crest of the Egyptian kings of the Horite family.

VI.—REMINISCENCES OF THE HORITES, AND CONFIRMATION OF ALL THE PRECEDING PROPOSITIONS, ARE FOUND IN THE EARLY

[35] Gen. x. 14; Deut. ii. 23; Jerem. xlvii. 4; Amos ix. 7.

[36] Chabas, Voyage d'un Egyptien, quoted by Lenormant and Chevalier, ii. 160. This place must have been Bora.

[37] Anthon's Classical Dictionary; Art. Paestum.

HISTORY AND MYTHOLOGY OF PHŒNICIA, CHALDÆA, ARABIA, PERSIA, INDIA, ASIA MINOR, GREECE, ITALY, AND OF THE CELTIC AND GERMAN PEOPLES.

Phœnicia.—We have already seen that the Phœnicians are a Horite stock, not in the line of Shobal but of Ezer, the father of Akan. In him we must find the Isiris of Sanchoniatho, called by him erroneously the brother of Chna, who was the first to be named a Phœnician. Now Chna I make Akan, and not, as the semi-Hebrew later Phœnicians said, Canaan. Akan becomes Chna by the proper pronunciation of the initial ayin, for which, as in the Arabic, I have always vindicated a sound approaching that of *g*, the correctness of which appears in the Septuagint very frequently rendering *ayin* by *gamma*. Gakan would be more like the true form of the name of the son of Ezer than Akan or Jaakan. This form gives us the swan of Canaan, one of its insignia, being identical with the Latin cygnus, Greek Κύκνος. Let the unshemitic vowels be removed, and we have at once, with slight reduplication, the Chnas, given as the ancestor of the Phœnicians; and this Chnas or Akan we find coming from the shore of the Red Sea, according to the ancient tradition of the origin of the builders of Tyre and Sidon. He is their first king, Agenor or Akan the Horite. I reserve much that I have to say under this head for a future paper on the Phœnicians. Thabion, the Phœnician teacher, who led people astray, may have had the same name, if he be not the same person as Zibeon, the next to Shobal among the sons of Seir.[38] Shobal seems to be lost in the Phœnician story, unless Asbolus, who is obscurely mentioned as the same with Coum, or Achumai or Khem, the son of Belus and nephew of Canaan, father of the Phœnicians, and Mestraim father of the Egyptians, be he.[39] But the Cronus or Time which represents him, or that he represents in the Egyptian mythology as Seb, in Sanchoniatho is applied to his son, Ilus or Alvan, the brother of Onam or Dagon, the husband of Rhea (a word which is simply the Reaiah, Roeh or Ra, by which the eldest of the Shobalians is known), and the father of Jehid or Jeoud. Sanchoniatho plainly says that he went into Egypt, but did not reign there, his kingdom being in Palestine. The story of Sanchoniatho is a venerable record of primeval history, somewhat obscure and corrupted, yet of inestimable value.

[38] Sanchoniatho's Phœn. Hist. 93, 343 seq. Cumberland with a totally different end in view finds that Thabion is a Greek form of an older Zabion.

[39] Sanchoniatho's Phœn. Hist., 115.

Chaldæa.—The Ilus of Sanchoniatho and the Il or Ra of Babylonia are generally allowed to be the same.[39]* In the ancient Belus of that early empire, not that he really ruled in what is known as Babylonia, but his descendants, we have Alvan as Il with the Coptic article in a softened form prefixed, forming, as I have elsewhere shown, the word Baal, which is simply עֵל with an initial בּ. As for Ninus, he is, doubtless, a nunnated Onam, and the same as Anu, Oannes or Dagon, the Onnos, whose descendants were driven from Egypt into Babylonia. This is, indeed, the derivation given in all ancient records of Oannes and his family.[40] The god of Assyria is Asshur, and in him we have, I am persuaded, a reminiscence of the Egyptian Usecheres or Ashchur, his son Achashtari or Sesostris being the Chaldean Xisuthrus, as I hope yet to have an opportunity of proving at length.[41]

Arabia.—One of the regions in which most naturally we should be inclined to look for traces of the Horites, is Arabia. In the mythology and early history of that country we accordingly find them. An old god known to the Greeks is Dusares, otherwise Dhu-Sair.[42] The word Dhu signifies Lord, and Sair gives us the Bible name Seir. Connected with him is Hobal, a god whose worship was brought from the region of Syria Sobal, and who is the same as Aud, being the Cronus or Seb of the Arabians.[43] The people of Aud or Hobal are the original inhabitants of Irem, in which we find Jearim, the Kirjath or villages of which Shobal and his family inhabited.[44] Intimately allied to Aud or Hobal, as his sons and descendants, are Il or Dhucalyan, Monat, Shedad, Yaguth, Lokman and Lud. In Il, Calyan and Dhucalyan, we find Alian, the power of the initial ayin appearing in the second, and the princely Dhu preceding it in the third. Monat, though a name generally applied to a goddess, as in

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39* The Greek form Illinos given by Damascius, and with which Sir Henry Rawlinson (Rawlinson's Herodotus, App. Bk. i., Essay 10, 2, (111)), connects the Babylonian Il-enu, is more like Alvan or Alian. Guigniaut says Helon or El is the oriental Cronus. (Religions de l'antiquité, ii. 897.)

40 Cory's Ancient Fragments, 22, 31.

41 The Rev. W. B. Galloway (Egypt's Record, 157) identifies Xisuthrus and Sesostris. Whiston in Josephus (Ant. i. 2, 3) also identifies Seth and Sesotris. Seth, Sheth or Ashtar, the deity of the Egyptian Shepherds, is the same. So is the Persian Tashter and the Indian Twashtar or Satyavrata. The stories connected with all these names recall an ancient deluge, and a warfare with a Horite line. The children of Sheth (Numbers xxiv. 17), connected in Balaam's prophecy with Moab, are of this ancestry.

42 Guigniaut, iii 919.

43 Sale's Koran, Preliminary Discourse. Guigniaut ii 874. Lenormant and Chevalier, ii. 351.

44 Sale's Koran, Preliminary Discourse.

the case of Neith, gives us Manahath. Shedad is Dagon or Onam. Close to On, or perhaps the same place, is Fostat, which is simply a form of Shedad with the Coptic article prefixed, and meaning, like On, the strong city. Again, Dagon is the divinity of Ashdod in Philistia, which is of the same root as Shedad. Shedad plainly is a translation and not a corruption of the word Onam. For the connection of Shedad and Alvan I quote the authority of Hyde, who says that Shedad, the son of Aud, sent Dahak the Arab, the son of his brother Ulvanus, against Djemschid.[45] The historical statement is false, inasmuch as Djemschid was the son of this Dahak, if, as is most likely, he be Jachath son of Alvan, but the connection of Alvan and Onam as Shedad in the son of the former, is valuable. The Phœnician history of Sanchoniatho mentions a Sadid as a son of Ilus. Another representative of this family is Yaguth, who is Jachath, and he very properly is the supreme divinity of the Dhukailite Arabs,[46] the sons of Dhu-Calyan. Of the Adite line descended from Hobal, a prominent member is Lokman. He is Lubad or Gypt, *the vulture man*, and presents to us Achumai, Ahom or Achæmenes, with the prefix somewhat disguised of the Arabic article Al. The head of the Achæmenian Persians was said to have been nursed by an eagle or vulture, and Lokman is simply Al Achæmenes. Lubad is a form like Al Gypt, without the strong power of the cheth, rising from Ahumai rather than Achumai. He and his followers are reported to have been transformed into monkeys, the reverse of Mr. Darwin's hypothesis, and a tradition that we shall yet meet with in other lands.[47] To the above may be added Lud, the Arab, whose descendant Askelos founded the city of Ascalon, and who is undoubtedly the Lahad that gave to some of the Egyptians the name of Lud. He also is an Adite of Hobal. Among the kings of Egypt, whom the Arabs claim, are Kabus and his brother Al Walid. These may be Achumai and Lahad, the first in the form which we find in Cheops. Saba or Abd Shems (the servant of the sun), a very old Arabian king, I think may be Shobal, and his son Cahlan, Alvan,

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[45] Hyde, Religio Vet. Pers. 183.

[46] Banier, La Mythologie et les Fables expliquees par l'histoire, i. 528 seq. Kail or Cayl is a title of authority similar to Dhu, and is doubtless a form of (al or) Il, giving the full force of the initial ayin. The people of Khaulan who worship Il take their name from Alvan. The solar deity Dhu Kolosa is the lord of Elusa or Khulasa, the highest in heaven (Coelum) or Elysium. Eleusis is the same word.

[47] Sale's Koran, Preliminary Discourse. Lenormant and Chevallier, ii. 299.

especially as in Shobal we have the head of a pre-eminently solar line. A better acquaintance with the older Arabian historians would enable me to speak more decidedly upon this point.

Connected with the Arabian are the Talmudical legends. Some of these treat of Kabil, the head of the Deevs or demons. Kabil, as we shall yet see, is Shobal, associated in other mythologies with these same Deevs. The great enemy of the Deevs is Seth, not the son of Adam, but the Egyptian Sheth or Ashtar, whom we have already found at enmity with the Horite *family.*[48] *The Chemosh* of Moab is in all probability the Khem of Egypt and Cama of India, Achumai the son of Jachath.[49]

Persia.—Persia is the great Aryan land, an early name of which was Haroiou, the same word as Haroeh.[50] Its ancient history tells us that the first king who ruled in the earth after the great flood or destruction was Gil-shah or Kaiomers. He was called Abul-Muluk, or the father of kings.[51] This Gil or Gil-shah furnishes us with the name Il or Alvan, the full power of the initial ayin appearing in it; and he is the Abimelech who ruled in Gerar immediately after the destruction of the Cities of the Plain.[51*] Connected with him is Menoutchehr, the Egyptian Menes or Manahath the Horite, whose name on the monuments is Month-Hor. His son Nawder is a Neith-ra, and perhaps the Naater of the tablets. The Persian goddess Nahid is Neith or Nahath. We have already found that Djemschid or Achæmenes of the line of Gil-shah is Achumai. I have strong reasons, however, for making him the same as Kai Kobad, supposed to be a later Persian king, as I will yet show when treating of the Greek connections.[52] In Kai Kobad we have the Copt or Ægyptus already identified with Achumai. Lohurasp or Aurvadaçpa

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[48] Baring Gould's Legends of Old Testament Characters, 67.

[49] Sir Gardner Wilkinson, A Popular Account of the Ancient Egyptians, i. 236.

[50] Rawlinson's Herodotus, App. Bk. i. Essay xi. s. 14.

[51] Russell's Connection of Sacred and Profane History, ii. 23. London: Tegg.

[51*] Gilshah or Abimelech is probably the Abimelech of Abraham, who ruled in Gerar, his town, called after himself, being the Elusa of Ptolemy and others, now called by the Arabs El-Khulasa, thus shewing the power of the ayin. It is worthy of note that, although the name Elusa is not mentioned in the Bible, the Arabic version in Genesis xx. 1, 2, for Gerar reads El-Khulus, "as if referring it to Elusa." Robinson's Biblical Researches, i. 202. This is plainly the original of the Greek Eleusis, as well as of Elysium and Coelum, the Rarian plain near it being the region of Aroer, not far from Elusa. The first monarchy after the destruction of the Cities of the Plain was that of Gerar. The extensive and exceedingly ancient ruins in the neighbourhood of Elusa point to a far distant and high civilization.

[52] Vide Shah Nameh for this and other particulars in Persian History.

is plainly a later Horus, who appears on the Egyptian monuments as a successor of Achumai. As for Feridun, he belongs to a different line, his ancestor Shah-Giliv being a Bible Caleb, the form of the Persian connecting with Æsculapius, and the Aiskulabita of the Book of Nabathean Agriculture.

India.—I am not by any means the first to connect Seb and Siva. Siva marries Iswara, and of him are Haru, Hari, and the seven mothers of the earth, the Harits. He is the great Deev like Kabil, and the seven Harits carry him. He is the sun, and also, like Seb and Hobal, Cronus, although this title is often given to his son Cala or Caliya, who is Il, Ilus or Alvan, with the full power of the initial ayin, and corresponds to the Persian Gilshah. The haunt of Siva and Caliya is Cailasa, which is Elusa or Khulasa in the Geraritic region of Palestine, over which Abimelech ruled. Vaivaswat, the son of Caliya, is not very like Jachath; nevertheless, I am persuaded that it is the same word, the Vivaghat of the Persian being identical, and merely requiring the prefix of the Coptic article with reduplication to complete it. Vaivaswat is still the sun, and is the father of Yama, whom numberless writers have identified with the Egyptian Ahom and the Persian Achæmenes.[53] Yama's domain is the south and dark region. Gopt is one of his attendants, or rather he, as Gopt, is an attendant of Siva. Siva himself is called Gopati, which is Coptus and Ægyptus. Siva's son is Cartikeya, but Pococke has found him in Kerkestes, son of Ægyptus.[54] A daughter of this line is Umes, in whom is represented the female name Ahmes, so common in Upper Egyptian records. She is Durga, but Durga is Zirah the hornet, for its second letter is ayin, hence Zirga. In the Æolic Greek the change of z to d is exceedingly common. A better connection still for the Zorathites of Shobal's line is found in the full name of an early Indian monarch, who appears in the Ramayana, Dasaratha, king of Oude, or of the Aud people. Zorathi and Dasaratha are the same, although I do not think that any Pharaoh bore this generic title. Lakshman and Rama are his sons, the former giving the Arab Lokman, and connecting with the monkey race that built the bridge of stones by which Rama passed to Ceylon from the mainland, just as Lokman is one of the monkey Adites. Rama at once recalls the Rameses who descended from Achumai.

[53] Guigniaut, ii. 116. Cama or Cupid the same as Khem; i. 297.
[54] India in Greece, 89.

Rama is himself an incarnation of Siva; and a later Parasurama, or Rama with the axe, is the Greek Perseus. The enemy of Siva or Mahadeva, the great Deev, is Mahiasura, the great Asura, in whom appears Ashcur or Usecheres, the father of Ashtari, Ashtar or Sheth. Another Indian story furnishes, in a somewhat disguised form, the names of several members of the Shobalian family. Shobal himself is Kapila, a form like the Talmudical Kabil. Kalyana and Roja, descended from him, are Alvan or Reaiah, and Mandhatu is plainly Manahath, while the unfortunate and wicked Chetiya represents the unhappy and cruel Jachath.[55] Menu, Manu Swayambhu, the fertile cow Sabala, and many other mythological characters, belong to the same Horite story. Different tribes have preserved the same narrative in different forms, both as regards fact and the orthography of proper names.

Asia Minor.—I have already claimed for the famous city of Ilium a connection with Ilus or Alvan, a connection favoured by Bishop Cumberland.[56] The Atys of Phrygia gives us, in his mournful story, a version of the history of Jahath or Jachath, called Ati upon the Egyptian monuments. He is a solar divinity like Jahath, is born of the stones cast behind them by Deucalion and Pyrrha (Dhu Calyan[56*] and Phre, a Ra or Rhea, with the prefix of the Coptic article), and is the first of the Galli, or priests of the Sun, a word which is simply a plural of the Gil form of Alvan's name. He is called Papas, and a striking coincidence appears in the fact that the Egyptian king is termed Ati or Pepi.[57] The Cappadocians, often thought to be the Caphtorim, are truly a family of Copts.[58] They were an unmixed people, fond of independence, and distinguished from others as the White Syrians. It is in Lydia, however, that we look for the Horite family. This country had intimate relations with Assyria and Palestine it is generally conceded,[59] but I can

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[55] Hardy's Manual of Buddhism, 134.

[56] Sanchoniatho's Phœn. Hist., 473.

[56*] The value of the k in Deukalion is at once known by the fact that the Irish Declan, who represents him, becomes the Welsh Dylan. The ayin of Alvan thus appears. Davies' British Druids, 104.

[57] On this all Egyptologists are agreed.

[58] Vide Gesenii Thesaurum.

[59] Anthon's Classical Dictionary, Art. Lydia. In my article on "The Coptic Element in Languages of the Indo-European Family," (*Canadian Journal*, Dec., 1872, p. 405), I have shewn decided Arabian connections in the change of Aciamus and Atys to Alcimus (Lokman) and Alyattes, and in the presence of Sadyattes or Shedad in the Lydian dynasties.

prove a still more intimate connection with Egypt. A Lydian name of hoar antiquity is Sipylus or Shobal. The oldest king, however, whose name is recorded is Manes, who seems to reappear as the Maeon of Phrygia in the story of Atys. Manes is Menes and Manahath. His son is variously called Atys or Cotys. This is a mistake very likely to be made, Atys or Cotys being the nephew of Manahath, but ruling in Egypt as he did, while Alvan remained in Palestine. Atys or Cotys is Jachath. The sons of Atys are Lydus and Torybus. The former is Lahad. The latter is a word obscurely connecting with Achumai as the head of the Zorathites. We have a better name for him in the Aciamus, under whom Ascalus built Ascalon according to Lydian tradition.[60] Now Ascalus in the Arab story is a man of Ludim of Ad, and Lud is Lahad, the brother of Achumai. The relations of Moab and the line of Shobal we have already seen to be intimate, as Syria Sobal forms part of Moab, the image of the god Hobal came from that region, and Khem or Achumai is Chemosh, the Moabite god. But Mopsus, who is Moab, and Sipylus, who is Shobal, are represented as drowning Ichthys, the son of Atargatis, in a lake near Ascalon.[60] In Áttis, Sabus and Minotaurus, so closely joined by Guigniaut, we find the three names Shobal, Manahath and Jahath.[61] Although not in Asia Minor, I may mention in this place the solar line of Colchis, including two forms of Jachath or the Egyptian Ati and Hekt. These are Aeetes and Hecate. The temple of Jupiter Actæus at Iolcos also commemorates Jachath.

Greece.—Among the islands, Crete is worthy of attention. There Minos is said to have ruled, and in him we see Menes and Manahath. The labyrinth agreeing with that of Mendes,[62] and the Minotaur, which is Mouth-Hor or the Persian Menoutchehr, confirm the identification. The Egyptian origin of Rhadamantus, the presence of Cherethites or Creti in the south of Palestine, and a town Minois near Gaza, are more than sufficient evidence of the transmission of the old Egyptian history to the island of the Mediterranean.[63] The names of Deucalion (Dhu Calyan) and Androgeus (Nawder or Naater) in the Cretan genealogies are also worthy of note.

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[60] Xanthus ap. Creuzeri Fragmenta.
[61] Guigniaut, ii. 944.
[62] Diod. Sic. i 61, 66. Strab. xvii. 1, 42.
[63] Vide Hitzig, die Philistaer.

Of scarcely less importance than the history of Crete is that of Rhodes.[64] Its line is one of Heliads, a solar line. The sons of Helius, who is Ilus or Alvan, fled on account of a deluge, which reminds us of that of Gilshah, to other lands. Among them, Actis went to On or Heliopolis in Egypt, and taught the Egyptians astrology. Who can fail to recognise Jachath? Another is Ochime, whose name preserves more purely than any other the original form Achumai. His daughter Cydippe married Cercaphus, another Heliad, whom I have not yet been able to identify. From this union sprang Lindus, Jalyssus and Camirus, the equivalents of which I have not found. But in Cercaphus I recognise a head of the Cercopes, who infested Lydia in the time of Omphale, and whom Hercules changed into apes. Thus we have three traditions—the Arab, the Indian, and the Lydian forming about Achumai as a centre. The narrative of Diodorus Siculus takes some of the Heliades to Tabor in Palestine, although to him it is the Rhodian Atabyris. Ritter holds that Tabor is the original of the Rhodian name.[65] Some distance to the north of this mountain and westward on the sea-coast is Ecdippa, commemorating the name of Ochime's daughter, and close beside Ecdippa is Ummah, a memorial of himself. Cercaphus may survive in an Acrabbi (or Gecrabbi giving the force of the ayin) lying near Carmel, which at least one writer has identified with Camirus.

In Bœotia we meet with Actæon, the brother of a Hecate, who was torn to pieces by his dogs, just as Jachath or Achthoes was killed by his own guards, who should have defended him. His story is made a parallel to that of Atys, son of Crœsus, accidentally slain by his attendant.[66] In the same country, of which Thebes, a reminiscence of an Egyptian Thebes, was the capital, Sipylus (Shobal) and Minytus (Manahath) are numbered among the sons of Amphion and Niobe.[67] Amphion is the son of Epopeus (Apophis) and Antiope (Neith-pe), while Antiope is the daughter of Nycteus (Ma-Nachath). A form resembling Nycteus, in the absence of the initial M, is Antæus, whom Hercules slew in Egypt. Actæus, the ancient king of Attica, preceding Cecrops, probably Cercaphus, is Jachath or Achthoes, whose dominions, after the capture of On, would extend

[64] Diod Sic. v. 55, seq.
[65] Die Vorhalle Europaischer Volkergeschichten 339, seq.
[66] Diod. Sic. iv. 81, seq.
[67] Apollodori, iii. 5, 6.

to Djebel Attaka. Echetus, the cruel king of Epirus, may be a memory of the same date, and the very word *Echthos, an enemy*, a generalization of the character of one whose early death cannot atone for his wickedness.[68]

It is, however, in the great family of the Dorians that we must find the ancestors of the Caphtorim and Zorathites. Their history begins with a deluge, the third which has come under our notice. This deluge I have good authority for placing on the borders of Egypt.[68*] It is that of Deucalion. I have already anticipated, by taking it for granted, that Deucalion is the Arab Dhu-calyan. He is Alvan, the Deev. A like name from a place in the same Palestinian region, the town of Nyssa, south of Gaza, is Dionysius, a Dhu-Nyssa. As Gilshah, we have found Deucalion ruling at Elusa, not far from the town which Diodorus connects with the Bacchic god.[69] Him, however, for the present we must dismiss. The wife of Deucalion is Pyrrha, the Rhea of Ilus, and a female Egyptian Hhrah. The son of Deucalion is Hellen. Here we find the Dorian annalists guilty of multiplication like Manetho and his Egyptian predecessors, for Hellen and Deu-calion are one, the former replacing by a simple aspirate the hard initial sound of the latter, made necessary by the prefix Deu. Hellen is Alian, and the original Hellenes are the Alonim, a truly royal name. Of the sons of Hellen, we must dismiss Æolus. I know nothing certainly concerning him. Dorus and Xuthus remain. The former appears too early. The latter is Jachath. Dorus is another name for Achumai, answering in a measure to the Torybus, who is brother of Lydus. The Zorathites, in the form Zorah, furnish the Dorian name by the Æolic change of z to d. Of Apollo and Phthia, a purely Egyptian name, answering to Phthah, while Apollo is any solar personage, came Dorus and Laodocus, and these are the solar Achumai, the Zorathite, and Lahad, his brother. These answer to Lydus and Torybus of Atys or Cotys. The daughter of Dorus is Xanthippe, but the daughter of

[68] I have not given authorities for this Homeric and similar names with their connected legends, as they are accessible in any good classical dictionary, and a useless list of references would unnecessarily swell the size of the paper.

[68*] Hieronymi, Chronicon Eusebii. It is true that the deluge of Ogyges (Agag) is named instead of that of Deucalion, but it is plain that they are one, for Ogyges is the founder of Eleusis, which is Elusa in Gerar. Africanus, in the third Book of his Chronicle, quoted by Syncellus, seems to speak of Ogyges and Actæus as if one person. Now, Actæus is Jachath, son of Alvan or Deucalion.

[69] Diod. Sic. iv. 2.

the Persian Kai Kobad, who is also Achumai, is Sendabeh, and the daughter of Ochime is Cydippe. It is utterly impossible that this can be mere coincidence. A son of Dorus is Teutamas, and Tothmosis is a successor of Ahmes or Achumai. The mythic ancestors of the Dorians is Ægimius, and in him we again find Achumai appearing. Dymas, the son of Ægimius, is but a shortened form of Teutamas of Dorus, and Tothmosis of Ahmes. Herodotus rightly brings the Dorians from Egypt. Mazocchi correctly traces them to Dor and Endor and similar towns south of Carmel.[70] Their cities are the same as those of the Heliads of Rhodes, for Helius is Hellen, Actis Xuthus, and Ochime Ægimius or Dorus. Epidaurus is a later form of Caphtor. I have said that I know nothing of the Æolians. Their story connects intimately with that of the Dorians, and it may be that Æolus is also Alvan. Sisyphus is certainly his brother Shepho, Œbalus is Ebal, and Œnomaus Onam. Time will not permit me to show the extent of my researches in connection with them.

Illyria may here engage our attention, as lying between Greece and Italy. I should never have been induced, had not other evidence led me to it, to divide this word into the two constituents Il and Ri, although this combination is justified by the Chaldæan equivalent of Alvan, Alorus.[71] The Eneti, or descendants of Anah, we have already seen to be an Illyrian people. In Illyria were also found Oreitæ (Horites), and Dassaritæ (Zorathites), a name which at once calls to remembrance the Indian Dasaratha. The modern, as well as the ancient, Albanians are the people of Alvan, and their other name Skipetar, as well as their town Epidaurus, represent their old home in Kebt-Hor and their Bible name Caphtorim. A glance at Illyrian geography will furnish abundant evidence of the Horite ancestry of the brave Albanians.

Italy.—Hyde has already, in the Arabic Sambula, provided a common ground on which Sybil and Spica, the Hebrew Shobal and the Egyptian Sebek, may meet. The Sabine god Sabus, and the whole Sabellian family unite in this connection. The Rhodian Helius becomes the Latin Sol, and the Hebrew Alvan the Latin Silvanus, by the same rule. Silvanus, the enemy of children, is the cruel Ilus

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[70] Vide note 37. Dora was probably the most southern of the Phœnician towns. Its inhabitants were never subdued. Stephanus of Byzantium calls its founder Dorus, son of Neptune. —Smith's Dictionary of the Bible.

[71] Berosus, Cory's Ancient Fragments. Galloway, E. R., 162.

or Cronus, who is represented as sacrificing his son. The Silenes, named after him, are a monkey race, once more reproducing the Arab, Indian and Lydian stories. Rhea Silvia or Ilia is the old Rhea, wife of Ilus, the Pyrrha that married Deucalion, and that bears both the names of the eldest son of Shobal. The Etruscan Mantus is Manahath. Apollo and Apulia represent Ebal. Coelus and Elysium are the abode of Shobal, the great Deev, and his son Alvan, or Gilshah, or Caliya, in Elusa or Khulasa, the Cailasa of the Hindoos. Of Coelus and Hecate, a strange combination, seeing that they are the names of father and son, Janus is said to be the offspring. But Janus, the fish-god, is Oannes or Onam, a prominent member of the Horite family. The line of Alba, the white city, is peculiarly Horite. In it we find Latinus, who is Lotan. Alba Sylvius is Alvan himself, twice named over. His son Atys is Jahath, and, strange to say, is also called Capetus, while his son is Capys, thus twice reproducing the Ægyptus, Kobad or Cheops, whom we have found to be Achumai. Thus plainly did the old story of a far-off and bygone civilization live in the memories of those who claimed as their ancestors the children of Seir, the Horite.[72]

Germans and Celts.—The German and Scandinavian mythologies have few points of connection with the Horites. Their gods and heroes belong principally to two other families, those of Etam and Ashchur. The red Shethites are among the ancestors of these peoples. Still Ra or Il survives in the god Frey with his wife

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[72] The following table presents the names, which, generally in genealogical order, recall the principal family of the line of Shobal:

Horite.	Shobal.	Alvan, Alian. *Rech, Reaiah.*	Jachath.	Achumai.
Egyptian.	Seb.	*Ra.*	Achthoes, Ati or *Pepi.*	Ahom, Kames. *Cheops, Ægyptus.*
Phœnician.	——	Elioun, Ilus.	Jehid.	?Coum.
Arabian.	Hobal.	Il, Ulvanus. Dhucalyan.	Yaguth.	Lokman. *Kabus.*
Persian.	——	Gil-shah.	?Zohak.	Achæmenes. *Kai Kobad.*
Indian.	Kapila. Siva.	Cala, Kalyana. *Raja.*	Vaivaswat. Chetiya.	Yama. *Gopati.*
Lydian.	Sipylus.	——	Atys or Cotys. *Papas.*	Aciamus. Alcimus.
Rhodian.	——	Helius.	Actis.	Ochime.
Dorian.	——	Hellen. Deucalion.	Xuthus.	Æginius.
Alban.	——	Alba Sylvius.	Atys or *Capetus.*	*Capys.*

Freya, the Egyptian Phre, and as Il in the annual feast which was held in his honour, called Yule.[73] Ondurdis also is the Egyptian Onderah or Denderah, which takes its name from the god and first ruler of Heliopolis. The Celtic divinity, Ogmius, with his Mercury and Hercules associations, has been frequently identified with Ahom, and is Achumai. The Irish Ogomuin, son of Thoi, must be the same, Thoi being a form of Jahath, an Achthoes without the first syllable. He seems to be represented by the British Beli, who is called erroneously son of Manhogan (Manachath), and correctly the father of Llud (Lahad). Beli may be the name of Alvan himself, given to Jachath when accurate history perished, and a tendency arose to reduce the solar divinities to unity.

The Ethiopian deity Assabinus, and its earliest monarch Arwe, may be Eshban and Haroch. Manachath may appear not only in the Chinese Ming-ti but also in the Peruvian Manco-Guina-Capac and the Algonquin Manitou. It would be strange if the ancient people of China and the tribes of this continent could be shown to have dwelt within the influence of a Horite civilization. The unity and recent origin of the human race would be at once established could this be done, as I doubt not it will be before long. In the meantime, the various traditions of civilized peoples have carried us back to the days of Abraham and to the lands in which he sojourned—Palestine, Egypt, and the region lying between; and pointed these out as the time and the place when and where man, a second time beginning to fill the earth, laid the foundations of his present prosperity. The facts I have given, through the connections established between the Scripture narrative and tradition, are a besom to sweep into the waste-basket of literature the utterly unfounded hypotheses of Bunsen and others, which throw the commencement of Egyptian history thousands of years into the past. They abolish, I trust for ever, that absurd class of interpreters of mythology, who make Euhemerus a continual object of scorn, and pleasingly imagine a world sitting down in its various divisions to weave out of its own brain a complex and unintelligible solar allegory. They say to the ethnologist, the student of language, the comparative geographer, the groper towards a science of religions, the historian, as they point to the eastern life of nearly four thousand years ago—there is the long-forgotten field in which your studies must begin if they are to be

[73] Mallet's Northern Antiquities. Bohn; 110.

successful. And, more important than all, they tell the Gentile of a Divine hand, not simply leading him as well as the Jew through the early period of the world's history, but placing on record, briefly as becomes the littleness of things human in view of the Divine, yet comprehensively, the roll of his forgotten ancestry. Spite of all questions regarding the books of Chronicles, the Bible still proves itself the true and faithful Word, the great standard of historic fact as well as of spiritual truth and life. I am fully conscious of the importance of the revolution which the acceptance of the truths set forth in this paper will cause in the world of historical science. Of this, however, I am also sure—

"Magna est veritas et prævalebit."

NOTES ON STATICS.

BY JAMES LOUDON, M.A.,
MATHEMATICAL TUTOR AND DEAN IN UNIVERSITY COLLEGE, TORONTO.

The following notes are in continuation of what was published in the *Canadian Journal* for February, 1872. All these proofs were devised by the writer during the year 1868, but were not communicated to the Canadian Institute until November, 1870.

7. On transferring the origin from O to a point O' at a distance r on OA, we will have there R, G, and $Rr \sin \theta$, the axis of the latter being parallel to OD, perpendicular to the plane ROA. The axis of the resultant couple G' at O' is therefore in a plane parallel to DOC, and the plane of G' must therefore meet the plane of G along a line parallel to OB.

8. If OC be perpendicular to DOA, the plane of G' will intersect ROA along OA, in which case the reciprocal lines will coincide or be parallel.

9. To find the moment centre of a plane passing through a given line. Let the plane be the plane of the paper, OA the given line, R, G, the force and couple at O; α the angle which the axis of G makes with the given plane; OF in the given plane perpendicular to the axis of G; OD perpendicular to ROF; γ the angle ROF; δ the angle between OD and the given plane.

Then on transferring to O' at a distance r in OF, we have there R, G, and $Rr \sin \gamma$, the axis of the latter being parallel to the plane GOD. Therefore the axis of G', the Resultant of G and $Rr \sin \gamma$, will be perpendicular to the given plane if

$$G \cos \alpha = Rr \sin \gamma \cos \delta,$$

$$\text{or } r = \frac{G \cos \alpha}{R \sin \gamma \cos \delta},$$

which determines the position of O', the moment-centre of the given plane.

10. The angle between OA and its reciprocal is plainly $\frac{\pi}{2} - \phi$. The lines are therefore perpendicular to each other when $\phi = 0$, which requires OA to be coincident with OC, and therefore

$$\cos \beta = \cos \theta \cos \alpha.$$

In this case, calling the forces F_1 and F_2, we have

$$F_1 = R\cos\theta,\ F_2 = R\sin\theta,$$
$$p = \frac{2G\cos\beta}{R\sin 2\theta}.$$

Now p is least when $\sin 2\theta$ is greatest, $\frac{G\cos\beta}{R}$ being constant, that is, when $\theta = \frac{\pi}{4}$, in which case,

$$F_1 = F_2 = \frac{R}{\sqrt{2}},$$
$$\text{and } p = \frac{2G\cos\beta}{R}.$$

11. Let F_1 and F_2 denote generally the forces which act along the reciprocal lines; then the volume of the tetrahedron of which these lines are opposite edges

$$= \tfrac{1}{6} F_1 F_2 p \sin\left(\frac{\pi}{2} - \psi\right)$$
$$= \tfrac{1}{6} \frac{R\cos(\theta-\psi)}{\cos\psi} \cdot \frac{R\sin\theta}{\cos\psi} \cdot \frac{G\cos\phi}{R\sin\theta} \cdot \cos\psi$$
$$= \tfrac{1}{6} RG \frac{\cos(\theta-\psi)\cos\phi}{\cos\psi}$$
$$= \tfrac{1}{6} RG\cos\beta$$

since $\frac{\cos\beta}{\cos(\theta-\psi)} = \frac{\cos\phi}{\cos\psi}$.

And $\frac{1}{6} RG\cos\beta$ is constant. Wherefore, &c.

12. To find the relative positions of the reciprocal lines and the central axis.

Let LM, $L'N$ be the projections of the reciprocal of OA and the central axis on the plane ROA (figure of § 4); OM, ON the respective perpendiculars on these from O.

Then $OL = \frac{OM}{\cos\psi} = \frac{s\sin\alpha}{\cos\psi} = \frac{G\cos\psi\sin\alpha}{R\sin\theta\cos\psi} = \frac{G\sin\alpha}{R\sin\theta}$.

Also $OL' = \frac{ON}{\sin\theta} = \frac{\rho\sin\lambda}{\sin\theta} = \frac{G\sin\beta\sin\lambda}{R\sin\theta} = \frac{G\sin\alpha}{R\sin\theta}$,

where ρ is the distance of the central axis from O, and λ the angle between the planes ROG, ROA.

The projections of the central axis and the reciprocal of OA pass, therefore, through the same point L at a distance from O equal to

$$\frac{G\sin\alpha}{R\sin\theta}.$$

13. If p' dènote the perpendicular distance between OA and thl central axis, we have

$$p = \frac{G \cos \phi}{R, \sin \theta}$$

$$p' = \frac{G \sin \beta \cos \lambda}{R} = p - \frac{G \cos \beta \cot \theta}{R}.$$

Therefore $(p - p') \tan \theta = \frac{G \cos \beta}{R}$, which is constant.

14. To reduce the Resultant force R, and the Resultant couple K, the origin being on the central axis, to two forces one of which shall act along a given line.

Let the given line be in the plane of the paper at a distance p_1 from and makiug an angle θ_1 with the central axis which may be supposed parallel to the plane of the paper.

Resolve R into Q, $R-Q$, at distances p_1, $\frac{p_1 Q}{R-Q}$, respectively, from the central axis; and let the forces of K be each equal to $\frac{R-Q}{p_1 R} K$ at a distance $\frac{p_1 R}{R-Q}$ apart. Then taking one of the forces of the couple to act with Q, and the other with $R-Q$, we have

$$F_1^2 = Q^2 + \left(\frac{R-Q}{p_1 R} \cdot K\right)^2,$$

$$F_2^2 = (R-Q)^2 + \left(\frac{R-Q}{p_1 R} \cdot K\right)^2,$$

$$\tan \theta_1 = \frac{R-Q}{p_1 R} \cdot \frac{K}{R},$$

$$\tan \theta_2 = \frac{K}{p_1 R},$$

where θ_2 is the angle which F_2 makes with the central axis. From these we find

$$F_1 = \frac{KR \sec \theta_1}{K + p_1 R \tan \theta_1},$$

$$F_2 = \frac{R \tan \theta_1}{K + p_1 R \tan \theta_1} (K_2 + p_1^2 R^2)^{\frac{1}{2}},$$

$$\tan \psi' = \frac{K + p_1 R \tan \theta_1}{p_1 R - K \tan \theta_1},$$

since ψ', the angle between F_1 and F_2, is equal to $\theta_1 + \theta_2$.

15. The formulas of §13 follow immediately from those of the preceding section, as does also the property proved in § 11. Thus six times the volume of the tetrahedron

$$
\begin{aligned}
&= F_1 F_2 (p_1 + p_2) \sin \psi' \\
&= F_1 F_2 (p_1 + p_2) (\sin \theta_1 \cos \theta_2 + \cos \theta_3 \sin \theta_2) \\
&= F_1 F_2 (p_1 + p_2) \left(\frac{S}{F_1} \cdot \frac{R-Q}{F_2} + \frac{Q}{F_1} \cdot \frac{S}{F_2} \right) \\
&= (p_1 + p_2) (R-Q+Q) S \\
&= KR,
\end{aligned}
$$

where $S = \dfrac{R-Q}{p_1 R} K$.

16. The principle of Virtual Velocities.

Lemma. The most general displacement of a body can be effected by supposing it to move along and around a certain straight line.

Suppose that a body is at rest under the action of the forces $P_1, P_2, P_3, \ldots P_n$ at the points $A_1, A_2, \ldots A_n$, and that the forces make angles $\theta_1, \theta_2, \theta_3, \ldots \theta_n$ with the above line; then the sum of their components parallel to this line vanishes, as does also the sum of their moments around it.

(i). Let the displacement be along the line through the distance $A_1 B_1 = A_2 B_2 = \ldots = \delta r$; then

$$
\begin{gathered}
\Sigma (P \cos \theta) = 0, \\
\Sigma (P \delta r \cos \theta) = 0, \\
\text{or } \Sigma (P \delta p) = 0 \ldots\ldots (1),
\end{gathered}
$$

where δp_1 is the projection of δr on the direction of P_1, &c.

(ii). Let the displacement be around the line through the angle δa, so that P_1 now acts parallel to its former direction at C_1, where $B_1 C_1 = \delta s_1 = a_1 \delta a$, if a_1 denote the distance of B_1 from the central axis. Also let φ_1 be the angle between a_1 and p_1, the distance of the component $P_1 \sin \theta_1$ at B_1 from the central axis. Then

$$
\begin{gathered}
\Sigma (Pp \sin \theta) = 0, \\
\Sigma (Pa \cos \phi \sin \theta) = 0, \\
\frac{1}{da} \Sigma (P \delta s \cos \phi \sin \theta) = 0, \\
\Sigma (P \delta s \cos \phi \sin \theta) = 0.
\end{gathered}
$$

But $\cos \varphi_1 \sin \theta_1 = \cos \psi_1$, if ψ_1 be the angle between $B_1 C_1$ and the direction of P_1; therefore

$$
\begin{gathered}
\Sigma (P \delta s \cos \psi) = 0, \\
\text{or } \Sigma (P \delta p') = 0 \ldots\ldots (2).
\end{gathered}
$$

where $\delta p_1'$ is the projection of B_1C_1 on the direction of P_1. But if $\delta\sigma_1$ denote the projection of A_1C_1 on the direction of P_1, we have

$$\delta\sigma = \delta p + \delta p'.$$

Therefore from (1) and (2) we have

$$\Sigma\,(P\,\delta\sigma) = 0,$$

the general equation which expresses the principle.

17. When there is a system of bodies at rest under the forces $(P_1, P_2, \ldots.)$, $(Q_1, Q_2, \ldots.)$, &c, and the mutual actions between the bodies, then supposing the whole system as such to receive the most general infinitesimal displacement, it follows that

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) + \ldots\ldots = 0,$$

in which equation the virtual moments of the mutual actions between the bodies have disappeared.

18. If one body only of the system is displaced, then

$$\Sigma\,(P\,\delta p) = 0$$

in which equation the virtual moments of the various reactions of the other bodies on it will appear.

19. If two bodies only be displaced around and along the same line, then

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) = 0,$$

in which equation the virtual moments of the mutual actions of the two bodies only have disappeared.

20. If all the bodies receive displacements around and along different lines, the virtual moments of the mutual actions appear in each of the equations

$$\Sigma\,(P\,\delta p) = 0,\ \Sigma\,(Q\,\delta q) = 0,\ \&c.,$$

and also in

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) + \ldots\ldots = 0.$$

ON THE

HABITS OF A SMALL SNAKE IN CAPTIVITY.

BY E. J. CHAPMAN, PH.D,

Professor of Mineralogy and Geology in University College, Toronto.

Our knowledge of the anatomy of Reptiles, so far at least as regards living types, leaves probably little to be desired; but a wide field of research is still open to our study of the ways of life and mental characteristics, so to say, of these creatures. The following notes, on the habits of a small snake in captivity, are offered as a slight contribution to this study. Captive animals live necessarily to some extent under abnormal conditions; but this, although rendering our observation of their habits more or less incomplete, is not without certain advantages. It affords a test, for example, of the creature's powers of adaptation to change; and it serves to develop or reveal traits of character to which instinct can in no respect lay claim.

The subject of my memoir was captured, I believe, on the grassy slope in the immediate vicinity of our University Buildings, but it came into my possession as follows:—On entering my lecture-room one afternoon in October 1871, I thought that the attention of the students was fixed in a somewhat remarkable manner on the table before me; and this was soon explained by a rustling noise beneath some drawings lying loosely there, followed by the emergence from among these of a small snake—the little creature turning rapidly about, seemingly bewildered by its novel situation, and by the unrestrained burst of applause with which its appearance was greeted. Seeing that it belonged to a well-known harmless species, I covered it with a chemical beaker-glass that happened to be at hand, and so kept it imprisoned until the lecture was finished. I then put it into a small bottle with the intention of liberating it in the Park on my way home, but forgot to do so: in fact, it remained in its close quarters in the pocket of my coat until the next morning. The idea then occurred to me to keep it for a short time in order to observe its habits. I prepared a sufficiently roomy dwelling for it, by attaching

two wide-mouthed bottles together by a perforated cork: placing in one of the bottles a handful of damp grass, and a little water in the other—the two resting habitually on their sides. The little snake could thus travel at will from one to the other through the perforated cork.

My captive belonged to the common Canadian species known familiarly as the "little brown snake," originally regarded, and I think correctly so, as a variety of *coluber ordinatus*. This species has been referred, however, of late years, to Kuhl's genus *Tropidonotus*, under the name of *T. Dekayi*. The genus *Tropidonotus* is made to include the colubers which habitually resort to the water, and which have two plates above the eye-orbit, in place of a single plate as in the colubers proper. The aquatic tendency in snakes, I imagine, is a very indefinite character, as there are probably few of these creatures that do not take to the water more or less readily in pursuit of prey. I have frequently seen both our little "grass snake," *Coluber vernalis*, and the small "ringed snake," *C. punctatus*, swimming freely in streams and pools in the woods; and some years ago, at the northern extremity of Lake Couchiching, I killed with a canoe-paddle a young rattlesnake that was swimming boldly nearly half a mile from the shore. The men at the Severn Mills to whom I shewed my booty, and who had several large snakes nailed to one of the doors of the mill, assured me that the rattlesnakes there commonly took to the water when pursued. Leaving, however, the question of generic identity, I may mention that the "little brown snake" is distinguished more especially by the following characters: The colour above is ash-brown, with a broad band of somewhat lighter tint running along the dorsal ridge, and a row of small dark flecks or spots upon the sides. On the ventral surface, the colour is very pale brown, and each large ventral plate bears a minute black dot upon the sides. The head is small, flattened horizontally, and protected above by ten plates, three of which are almost black; and a black band runs obliquely across each side of the head, and another passes transversely across the neck. The dorsal and lateral scales are strongly carinated. The ventral scales below the anal orifice form a double row, as in all the Colubers, and the tail tapers to a point of extreme fineness. Fang teeth are altogether wanting. This species frequents the same haunts as the beautiful little grass snake, *C. vernalis*, and much resembles it in general form and size; but the grass snake has smooth scales, and it

is of course at once distinguished by its delicate bluish-green colour. I have often seen the two crossing each other's paths without exhibiting any hostile propensities, although the grass snake is said to fight desperately at times with the ringed snake and other small species.

My little captive appeared to accommodate itself to its prison very readily. It would lie coiled up and almost invisible among the grass, or hang suspended from some of the grassy stalks, during many consecutive hours, and would then become for a time exceedingly active, twisting itself very rapidly through the stalks, and gliding backwards and forwards from one end of the bottle to the other. It very rarely left its grassy cover, however, and entered the empty bottle; but now and then it did so. When hanging motionless, and especially during pauses in its perambulations, it kept up a constant protrusion and withdrawal of its forked tongue. As a rule, the tongue was darted straight out, and was then drawn back with two or three rapid lateral vibrations, and this movement was sometimes maintained for hours together. The little creature never seemed to exhibit any fear, but it evidently tried to conceal itself at times among the grass; and when I first had it, I thought occasionally that some one must have opened the bottle during my absence, and let the creature escape, as I frequently looked for it without detecting its presence for several minutes, so closely did its body resemble the half withered grass and stalks amongst which it had twisted itself. To some extent also, I am sure, there was a slight adaptation in colour to the objects in contact with different portions of its skin, more especially when the sun was shining strongly upon it. During the entire winter it never exhibited the slightest disposition to hybernate, although the bottle on several occasions was exposed accidentally to a very low temperature.

I tried it with all kinds of food, but during the seven months that it remained in my possession, I never saw it eat the slightest particle. It took not the slightest notice of flies, spiders, and other insects; and I have seen a large fly settle on the outer cornea of one of its eyes, and remain there for some minutes, apparently unobserved. It drank, however, constantly, scooping up the water, and then raising its head to swallow, exactly in the manner of a bird—the tongue taking no part in the operation. Milk it would not touch; and on one occasion when I placed a drop of honey on its snout, it shewed signs of irritation, and rubbed off the honey immediately against the grass and the sides of the bottle.

On several occasions I placed it in a large flat dish filled with water, but it always made desperate attempts to get out, although swimming with great facility; and if a piece of stone were placed in the dish, it would crawl on to it in a moment. I have seen these snakes, when free, swimming rapidly in small streams and pools, but probably they only take to the water in quest of aquatic larvæ and other prey. Whilst it was swimming in the dish, I could not detect the slightest change in the cylindrical form of its body, although a lateral flattening is said to take place in species of the genus Tropidonotus during natation, by the peculiar mobility of the ribs.

After the lapse of three or four weeks, I opened the bottles almost every evening and allowed the little snake to have a walk upon the table, a row of books in upright position being placed around this to prevent the snake from escaping. It could easily, no doubt, have climbed over this barrier. It never did so, however, but kept travelling round and round against the sides of the books, and very rarely ventured across the open table. I frequently placed my hand in its path and let the creature glide over it, when the part played by the ventral scales in assisting the animal's progression became very perceptible. This is felt more especially if the thin skin of the back of the hand be exposed to the action of these ventral plates.

After the animal had been allowed, as described above, to take its first walk upon the table, it tried to avoid re-entering its nest, and constantly turned aside from the open mouths of the bottles placed before it. On my attempting to guide it into one of these by means of a long pen-holder that I happened to have in my hand, the creature became defiant—raising its head and arched neck above the table, and opening its mouth to the widest extent. Two or three smart taps upon its head, however, soon caused its courage to collapse, and in a moment it beat a retreat and darted into its bottle to hide itself amongst the grass. A somewhat similar skirmish ensued on the two or three succeeding evenings, when the time for retiring had arrived; but after that, it never attempted resistance; and whenever I wished to make the creature re-enter its bottle, I had only to rap sharply on the table, or pretend to strike at it with the pen-holder, to make it immediately betake itself to its grassy hiding-place. On witnessing this, night after night, I could well understand the asserted teachableness of the Indian snakes of which so many curious anecdotes are related. I had also another proof of its intelligence. During the

day, as a rule, the bottles in which it lived were put aside on a shelf in a warm part of my work-room, and were never opened. But, with only an occasional exception, the creature was let out for a short time every evening. In the morning it generally kept itself concealed amongst the grass; but regularly, night after night, I found it close to the united necks of the bottles, and often lying indeed partly within the perforated cork, ready to dart out as soon as the bottles were taken apart. This was, I think, too constantly repeated to be the effect of mere accident.

My chief object in keeping this little snake was to see it cast its skin; but as the creature continued active throughout the entire winter, and took, apparently, no food, I began at last to fear that in this respect I should be disappointed. Finally, however, when nearly seven months had elapsed from the date of the animal's capture, my wish was gratified. The mode by which the operation of getting rid of the old skin was effected, differed in one essential respect from that described by Professor Owen in his very elaborate work on the "Anatomy of the Vertebrates." In this work (vol. i., p. 553), the process is thus described:

"In serpents, the epiderm is shed, usually entire, and the animal, partially blindfolded by the opacity of the layer passing over the cornea, seeks an obscure retreat; but I have watched the process of exuviation in a captive snake. It rubs the front and sides of the mouth against its prison wall, thus detaching and reflecting the cuticle from the oral margin, until it is turned back from over the whole head: the snake then brings forward its tail and coils it transversely round the head, and by pushing the head through the coil turns the cuticle back upon the neck; then tightening the coil and renewing the forward movement, threading the body, as it were, through the caudal ring, the cuticle is pushed further and further back, until the eversion has been carried so near the end of the tail as prevents the further action of the coil; the animal finally glides along, dragging behind the whole of the loosened epiderm, and a few wriggling actions of the tail serve to completely detach it."

In my captive's case, the operation was somewhat less artistically performed. Shortly before the close of April, I noticed that the animal appeared to be sickening, and seemed disinclined to come out of the grass. A day or two after, I observed a ridge of dry skin raised around the margin of the snout; and in the course of a few

hours the skin all over the fore part of the head was gradually loosened and lifted, but nothing more occurred that day. Early the next morning, on examining the bottle, I found the snake had evidently twisted or matted together some of the stouter stalks and fibres of the grass so as to form a kind of narrow loop, within which it was then hanging with nearly half the skin pushed back from its body. At short intervals, the tongue in rapid vibration all the while, the creature urged itself further and further within the loop, and in this manner the skin was gradually forced back, until finally it came away altogether, a small portion of the extreme end of the finely-pointed tail coming off with it. On getting quite free, the creature drank very eagerly four or five times, and then retired among the grass and kept quiet, but was ready for its accustomed walk the same evening.

I waited now only for the coming of the warm days to take my captive to the fields and set it free. But it was doomed to die in its captivity. One evening whilst the snake was taking its usual promenade, a young cat, to which I had given shelter on a bitter winter night, and which afterwards remained on sufferance about the place, stole into the room unobserved and sprang suddenly upon the table. I was standing at the time a few paces off, and I had in my hand a somewhat bulky but unbound book. I made pretence to hurl this at the cat, when the book flew from my hand and struck the unfortunate snake, inflicting upon it a long and terrible wound, from which its entrails protruded. Seeing that the hurt was beyond remedy, I put the creature out of its pain by killing it at once: and thus our seven months' companionship was brought abruptly to an end.

CANADIAN INSTITUTE.

ANNUAL REPORT OF THE COUNCIL FOR THE YEAR 1871-72.

The Council of the Canadian Institute have the honor to present the following Report of the proceedings of the Society for the past year, from 1st December 1871, to the 30th November, 2872.

MEMBERSHIP.

The present state of Membership:

Members at commencement of Session, 1st December, 1871	332
Members elected during Session, 1871-72	12
Deduct.	
Deaths during the year 1872	4
Withdrawn	6
Total 30th November, 1872	334
Composed of	
Honorary Members	5
Life Members	20
Corresponding Members	5
Ordinary Members	304
Total	334

COMMUNICATIONS.

The following valuable and instructive papers and communications were read and received at the ordinary meetings held during the Session:

2nd December, 1871.—The President, "Short Sketch of the late Prof. Hincks."

2nd December, 1871.—Dr. Wilson, "A Pre-Darwinian Type of the missing link between Man and the Anthropoids."

9th December, 1871.—Dr. Canniff, "On the relation of Air germs to Suppuration."

9th December, 1871.—Dr. Nicholson, "Remarks on the action of Carbolic Acid in checking Suppuration."

9th December, 1871.—Mr. Watson exhibited a portion of an Aerolite found in Glengary in April last; and read a paper relating the circumstances of its discovery, and embodying some information relative to the subject of Meteoric Stones.

16th December, 1871.—The Annual Report.

16th December, 1871.—Dr. Nicholson, "Geological Continuity."

16th December, 1871.—The President laid on the table a two-franc piece, of the République Française, 1870, and some other coins illustrative of the vicissitudes of French History, and read a brief paper on the collection.

13th January, 1872.—The President's Annual Address, being a paper entitled "Toronto before the Conquest (1760) and after."

20th January, 1872.—Mr. A. Elvins, "On the connection between Sun-spots and the Rain-fall."

3rd February, 1872.—Prof. Kingston, "On the recent progress of Meteorological research in Canada;" and the President read a communication from the Rev. Mr. Dade, on "Lunar Influences."

10th February, 1872.—The Rev. J. Campbell, M.A., "The Coptic Element in the Indo-European Family of Languages."

17*th February*, 1872.—Prof. Nicholson, "Defects of the Geological Record."
24*th February*, 1872.—Dr. Reeve, "The Eye in health and disease."
2*nd March*, 1872.—Dr. Wilson, "Prof. Huxley's new Rules for Classification in Anthropology."
9*th March*, 1872.—The President, "Notice of Lahontan."
16*th March*, 1872.—Prof. Buckland. "Arboriculture in Canada."
23*rd March*, 1872.—Dr. McCaul, "The Trades of Ancient Italy."
23*rd March*, 1872.—Dr. Warren exhibited several relics of the Franco-Prussian war, accompanied with observations.
6*th April*, 1872.—The President read a communication on "Lunar Influences, from forty years' observation in Ontario," by the Rev. Mr. Dade.
13*th April*, 1872.—Prof. Chapman, "On some popular fallacies respecting certain Gold bearing Ores, Iron Ores, and Phosphate deposits, as occurring in Canada." And the President read a communication from the Rev. Mr. McNish, upon "The Authenticity of Ossian's Poems."
13*th April*, 1872.—Dr. Wilson made some observations on the Muskoka region, accompanied by a number of Sketches of the Scenery, taken by himself.

THE TREASURER IN ACCOUNT WITH THE CANADIAN INSTITUTE.

Debtor.

To Balance from last year			$339 39
To Cash received from 45 Members for subscriptions			233 00
" Journals sold			4 00
" Rents, $45; Commission, $2 10			39 90
" Government allowance			750 00
" Dividend Stock, April	$135 00		
" " " October	135 00		
			270 00
			$1,636 29

Creditor.

By Cash paid Insurance, Western, $5,000	$75 00		
" " Royal, $1,800	22 50		
			97 50
" Myles for Firewood			7 00
" Petty Expenses—			

Institute.	Library.	Journal.	
$6 06	$4 59		
18 73			
9 29	1 10	2 63	
4 81	0 43		
7 87	0 16	0 65	
8 02	0 43		
19 00		137 78	
51 15			
4 66	4 53	2 72	
8 47	1 05	0 12	
14 00		181 34	
$152 06	$13 32	$323 71	
		13 82	
		152 06	
			489 59
Carried forward			$594 09

	Brought forward	$594 09
By Cash paid Assistant Secretary's salary—January, April, July and October, $84 each		336 00
" Bain's account for Periodicals		15 00
" Allowance to Mrs. Galbraith		10 00
" Building Fund		102 16
By Balance carried forward		579 04
		$1,636 29

SAMUEL SPREULL,
Treasurer.

Toronto, 20th December, 1872.

The undersigned Auditors have compared the vouchers for the items of these accounts with the cash book, and find them to agree. The balance in hands of the Treasurer is $579 04.

W. J. McDONELL.
A. M. ROSEBURGH.

APPENDIX

DONATIONS OF BOOKS,

RECEIVED SINCE LAST ANNUAL REPORT, 30TH NOVEMBER, 1871.

1.—Journal Royal Geographical Society, Vol. 40, 1870 1
2.—Proceedings of Royal Geographical Society, Vol. 14, No. 5; Vol. 15, Nos. 1, 2, 3, 4; 1871 5
3.—Quarterly Journal of the Geological Society, Vol. 26, Part 4, Nov. 1st, 1870, No. 104 1
Vol. 27, Part 1, Feb. 1st, 1871, No. 105 1
Vol. 27, Part 2, May 1st, 1871, No. 106 1
Vol. 27, Part 3, August 1st, 1871, No. 107 1
4.—Journal of the Royal Asiatic Society of Great Britain and Ireland (New Series), Vol. 5, Part 1 1
Per H. Rowsell, Esq —From Major-General Lefroy, R.A.—
5.—On a Bronze Object, bearing a Runic Inscription, found at Green Mount, Castle Bellingham, County Louth, from the Society.
6.—Proceedings of the Literary and Philosophical Society, Liverpool—
No. 23, Sessions 1868–9 1
No. 24, Sessions 1869–70 1
7.—Resumen de las Observaciones Meteorologicas, Madrid—
December, 1866; November, 1867 1
December, 1867; November, 1868 1
Observaciones Meteorologicas de Madrid—
December, 1867; November, 1868 1
Anuario del Observation de Madrid, Ano 9, December, 1869 1
Anuario del Observation de Madrid, Ano 10, December, 1870 1
8.—Pamphlets from the Societies, per Smithsonian Institution—
Proceedings of the Geological and Polytechnical Society of West Riding of Yorkshire 1
List of Members 1

Proceedings of the Philosophical Society of Glasgow..... 1
Memoirs of the Geological Survey of India..... 1
Cretaceans of Southern India—
Vol. 3, Nos. 1 to 4, Series 6, Pelecypoda 1
Vol. 3, Nos. 5 to 8, Series 6, Pelecypoda 1
By Frederick Holiczka—
Vol. 7, Part 1..... 1
Vol. 7, Part 2..... 1
Vol. 7, Part 3..... 1
Record of the Geological Survey of India—
Vol. 1 1
Vol. 2 1
Vol. 2, Part 2, 1869 1
Vol. 2, Part 3, 1869 1
Vol. 2, Part 4, 1869 1
Vol. 3, 1870 1
Vol. 4, Part 1, 1871 1
Vol. 4, Part 2, 1871 1
Abhandlungen, &c., Zu Bremen 2 Bo. Ill. Haft 1
Bulletin de la Societè Géologique de France, Tome—
Vingt Huitième, Quillett, 1870–71 1
" " Septième, 1869–70; Quillett, 1870 1
" " Sixième, 1868–69..... 1
Table Générale des Articles, Tome Vingt Septième, 1869–70..... 1
Le Névé de Instidal et ses Glaciers par C. D. Sue..... 1
Om Skuringsmærker Glacial formationen og Terasser, &c..... 1
Carcionologiske Bidrag till Norges Fauna af. G. G. Sars. Christiania .. 1
Beritninger om Norges Deeltagelse i den Almendelige, &c. 1
Stockholm, 1876, Christiania Net kongelege Norske, &c., 1869 1
Beretnung om Bodsfamgflets Virksomshed, 1869..... 1
Index Schoiarum, &c., 1870..... 2
Generalbertning, &c., 1869..... 1
Foreningen till Norske Fortidsmi, &c., 1869 1
Storthings Efterretninger te, 1871, Christiania..... 1
Det Kongelige Norske, 1870..... 1
Christiania omgns Phanerogamer, &c. af A. Blytt. Chris. 1870..... 1
Nyt Magazine, Blytt. Chris. 1870 2
" " for Naturvidenskabsme, &c., 1870 1
" " " 1870 1
" " " 1871 1
Forhandliger i Vinderiskabssilskabet, Christiania, 1869..... 1
" " 1870 1
Norke Meteorologisk aarbog for 1869, udjevit af del Norke meteorogiske institnte 3 dies aargong 1
Rapport sur les Travaux la Societe de Physique, &c., 1st June, 1871 .. 1
Aurora Polare Observaten Piemonte Del Prof. Francisco Denza 1

Aurora Boréale Par P. F. Denza 1
Aurora Polare del 1869, " 1
Observazione delle Meteore Lumenose del, 1871-2 1
Sopra gli aerolite, &c. 1
Le stelle Cadente, &c. Del P. F. Denza 1
From the Linnean Society—
List of the Society, 1870 1
Additions to the Library 2
Proceedings of November 3, 1870 1
" December 15, 1870 1
Obituary Notices.
The Journal: Zoology, No. 49 1
" " No. 50 1
" " No. 51 1
" " No 52 1
Botany, Nos. 54 & 55 1
" No. 56 1
" No. 65 1
From the Cobden Club—
Commercial Policy of France, and the Treaty with England, for the Cobden Club 4
From Prof. Nicholson, M.A., M.D.—
Manual of Zoology 1
From S. Spreull, Esq.—
A General Atlas 1
Vols. of the Journal de L'Instruction Publique, Quebec, for the years 1867, '68, '69 and '70, and the Journal of Education for same years 8
From the Hon. J. M. Brodhead, of Washington—
Executive Documents Nos. 253 to 259, 2nd Session, 1867-8, 40th Congress; 1st Session, 41st Congress, 1869; 3rd Session, 40th Congress, No. 50 to 82, 1868-9 3
Impeachment of Andrew Johnson, Vol. 1, 2, 3 2
Annual Report of the Commissioner of Internal Revenue, year ending 30th June, 1871 1
Final Report of the United States Geological Survey of Nebraska 1
Smithsonian Report, 3rd Session, 40th Congress, 1868-69 1
Annual Report of the Chief of the Bureau of Statistics, &c., 1871 1
Finance Report, 1871 1
Diplomatic Correspondence, 2nd Session, 39th Congress, Vol. 2, 1866-7 1
Report on Indian Affairs, 1869 1
Land Office Report, 1871 1
Statistics of Population of the United States, 9th Census 1

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

BY THE REV. DR. SCADDING.

LIII.—(*Continued.*)—YONGE STREET FROM BOND'S LAKE TO THE SUMMIT OF THE RIDGES.

There are some representatives of the original émigrés still to be met with in the neighbourhood of the Oak Ridges; but they have not in every instance continued to be seized of the lands granted in 1798. The Comte de Chalûs, son of René Augustin, retains property here; but he resides in Montreal. An estate, however, at the distance of one lot eastward from Yonge Street, in Whitchurch, is yet in the actual occupation of a direct descendant of one of the first settlers in this region. Mr. Henry Quetton St. George here engages with energy in the various operations of a practical farmer, on land inherited immediately from his father, the Chevalier de St. George, at the same time dispensing to his many friends a refined hospitality. If at Glenlonely the circular turrets and pointed roofs of the old French château are not to be seen,—what is of greater importance, the amenities and gentle life of the old French château are to be found. Moreover, by another successful enterprise added to agriculture, the present proprietor of Glenlonely has brought it to pass that the name of St. George is no longer suggestive, as in the first instance it was, of wars in La Vendée and fightings on the Garonne and Dordogne, but redolent in Canada, far and wide, only of vineyards in Languedoc and of pleasant wines from across the Pyrenees.

A large group of superior farm buildings, formerly seen on the right just after the turn which leads to Glenlonely, bore the graceful name of Larchmere,—an appellation glancing at the mere or little Lake within view of the windows of the house: a sheet of water more generally known as Lake Willcocks—so called from an early owner of the spot, Col. Willcocks, of whom we have spoken in another section. Larchmere was for some time the home of his great grandson, William Willcocks Baldwin. The house has since been destroyed by fire.

Just beneath the surface of the soil on the borders of the lakelets of the Ridges, was early noticed a plentiful deposit of white shell-marl, resembling the substance brought up from the oozy floor of the Atlantic in the soundings preparatory to laying the telegraph-cable. It was, in fact, incipient chalk. It used to be employed in the composition of a whitewash for walls and fences. It may since have been found of value as a manure. In these quarters, as elsewhere in Canada, fine specimens of the antlers of the Wapiti, or great American stag, were occasionally dug up.

The summit level of the Ridges was now reached, the most elevated land in this part of the basin of the St. Lawrence; a height however, after all, of only about eight hundred feet above the level of the sea. The attention of the wayfarer was hereabout always directed to a small stream, which the road crossed, flowing out of Lake Willcocks: and then a short distance further on, he was desired to notice a slight swale or shallow morass on the left. The stream in question, he was told, was the infant Humber, just starting south for Lake Ontario; while the swale or morass, he was assured, was a feeder of the east branch of the Holland River, flowing north into Lake Simcoe.

Notwithstanding the comparative nearness to each other of the waters of the Holland and the Humber, thus made visible to the eye, the earliest project of a canal in these parts was for the connexion, not of the Holland river and the Humber, but of the Holland river and the Rouge or Nen. The Mississagua Indians attached great importance to the Rouge and its valley

as a link in one of their ancient trails between Huron and Ontario; and they seem to have imparted to the first white men their own notions on the subject. "It apparently rises," says the *Gazetteer* of 1799, speaking of the Rouge or Nen, "in the vicinity of one of the branches of Holland's river, with which it will probably, at some future period, be connected by a Canal." A "proposed Canal" is accordingly here marked on one of the first manuscript maps of Upper Canada.

Father St. Lawrence and Father Mississippi pour their streams—so travellers assure us—from urns situated at no great distance apart. Lake Itaska and its vicinity, just west of Lake Superior, possess a charm for this reason. In like manner, to compare small things with great, the particular quarter of the Ridges where the waters of the Humber and the Holland used to be seen in near proximity to each other, had always with ourselves a special interest. Two small lakes, called respectively Lake Sproxton and Lake Simon, important feeders of the Rouge, a little to the east of the Glenlonely property, and situated very close to streams that pass into the east branch of the Holland river: so that the conjecture of the author of the *Gazetteer* was a good one. He says, "apparently the sources of the Rouge and Holland lie near each other."

After passing the notable locality of the Ridges just spoken of, the land began perceptibly to decline; and soon emerging from the confused glens and hillocks and woods that had long on every side been hedging in the view, we suddenly came out upon a brow where a wide prospect was obtained, stretching far to the north, and far to the east and west. From such an elevation, the acres here and there denuded of their woods by the solitary axeman could not be distinguished: accordingly, the panorama presented here for many a year continued to be exactly that which met the eyes of the first exploring party from York in 1793. As we used to see it, it seemed in effect to be an unbroken forest: in the foreground bold and billowy and of every variety of green; in the middle distance assuming neutral, indistinct tints, as it dipped down into what looked like a wide vale: then apparently rising by successive gentle stages, coloured now deep violet, now a tender blue, up to the line of the sky. In a depression in the far horizon, immediately in front, was seen the silvery sheen of water. This, of course, was the lake known since 1793 as Lake Simcoe; but previously spoken of by the French sometimes as Lake Simon or Sheniong; sometimes as Lake Ouentironk, Ouentaron, and Toronto—the very name which is so familiar to us now, as appertaining to a locality thirty miles southward of this lake. The French also in their own tongue sometimes designated it, perhaps for some reason connected with fishing operations, *Lac aux Claies*, Hurdle Lake. Thus in the *Gazetteer* of 1799 we have, "Simcoe Lake: formerly Lake aux Claies, Ouentironk, or Sheniong, situated between York and Gloucester upon Lake Huron: it has a few small islands and several good harbours." And again on another page of the same *Gazetteer*, we have the article: "Toronto Lake (or Toronto): lake le Che (i.e., Lac aux Claies) was formerly so called by some: others," the same article proceeds to say, "called the chain of lakes from the vicinity of Matchedash towards the head of the Bay of Quinté, the Toronto lakes and the communication from the one to the other was called the Toronto river:" whilst in another place in the *Gazetteer* we have the information given us that the Humber was also styled the Toronto river, thus: "Toronto river: called by some St. John's: now called the Humber." We shall presently see how the name Toronto came to be thus variously applied.

The region of which we obtained a distant view, where

"The bursting prospect spreads immense around"

on the northern brow of the Ridges, is a classic one, renowned in the history of the Wyandots or Hurons, and in the early French missionary annals.

The peninsula included between Notawasaga bay, Matchedash or Sturgeon bay, the river Severn, Lake Conchichin and Lake Simcoe, was a locality, in former times, largely frequented by the native tribes. It was especially the head-quarters of the Wyandots or Hurons. Villages, burial-grounds, and cultivated lands abounded in it. Unusual numbers of the red men congregated there. It was, in short, the place of concourse, the place of meeting, indicated by the Huron term, which European lips have conveniently moulded into "Toronto." Gabriel Sagard has it in his "Dictionnaire de la Langue Huronne," published at Paris in 1636, in the form *Toronton*, and he translates it *Il y en a beaucoup*—there's plenty; whether of men or of nything else. He has killed many Tsonontouans: Toronton Tsonontouan ahouyo.

Not that we are to suppose the Hurons employed the word Toronto as a proper name. We know the aborigines used, for the most part, no proper names of places in our sense of the term. Their names of places were simply descriptions, or allusions to incidents. But the vocable TORONTO was observed by the white men to be emphatically uttered by their red companions, when pointing to the region round Lake Simcoe or when speeding on towards it; and that vocable was accordingly caught up and finally made use of as a proper local name in the European sense; just as already the word CANADA had been; from its sound having been continually heard on the lips of the red men in the Lower St Lawrence as they pointed in the direction of their huts or villages on the shore, the word Canada meaning simply "huts."

We may now see how it happened, as the old *Gazetteer* states and the early French maps shew, that Lake Simcoe was once called Toronto Lake. It was a notable sheet of water in the well-peopled region. We may also see how the Trent communication was sometimes called the Toronto river. It was a notable water highway from the south-east to the well-peopled region. And for a similar reason the Humber was likewise called by some the Toronto river. Its valley contained a travelled trail from the south to the same well-peopled region. It may be added that besides the waters and streams stated by the old *Gazetteer* to have once borne the name of Toronto, old maps and old French books of travel shew that Matchedash bay or Sturgeon bay, as we now call it, was once known as the Bay of Toronto; and the Severn, as one more Toronto river, these constituting, as is manifest by a glance at the map, a grand line of approach to the well-peopled region from the North-West.

And finally, it may now be seen how it happened that the spot on which stands the modern capital of Ontario came to acquire the name which it possesses, the sole use of which it has almost monopolized.

The mouth of the Humber, or rather a point towards the eastern side of the indentation known as Humber bay, was the landing-place of hunting-parties, trading-parties, war-parties, on their way to the north—on their way to the well-peopled region in the vicinity of Lake Simcoe. They disembarked here for the tramp to Toronto. It was the Toronto landing-place: the landing-place for wayfarers bound to Toronto. And gradually the starting-place took the name of the goal: the style and title of the terminus *ad quem* were usurped by the terminus *a quo*.

Thus it happened at length also that the stockaded trading-port in the course of time established here, near the indentation of Humber bay, came to be popularly known as Fort Toronto, although its actual name in the French official records was Fort Rouillé—a designation given it in compliment to Antoine Louis Rouillé, Count de Jouy, home colonial minister from 1749-54.

As to the signification which has been assigned to the word Toronto, of "trees rising out of the water"—we think the interpretation has arisen from a misunderstanding of language used by the Indian canoe-men. The Indian canoe-men, in coasting along the shore of Lake Ontario from the east or west would, we may conceive, point to "trees rising out of the water," the black poplars and pines of the Toronto island or peninsula, as a familiar landmark, shewing the place where they were to disembark for the populous region to the north. The white men, mixing together the facts indicated by the canoe-men's words, made of the expressions "trees rising out of the water" and "Toronto," equivalent terms, which they were not and were not intended so to be taken. As to the idea to which Capt. Bonnycastle gave some currency, by recording it in one of his books on Canada—that Toronto or Toronto was perhaps the name of an Italian engineer concerned in the construction of the Fort—it is sufficient to reply that we happen to know what the official name of the Fort was: it was Fort Rouillé, as has just been stated. Sorel, we believe, and Chambly and Schlosser, and possibly other places, derived their names from officers in the French service. But Capt. Bonnycastle's derivation for Toronto has no foundation whatever in the early annals of Canada. It was probably a mere after-dinner conversational conjecture. We meet with the name Toronto under several different forms in the French and English documents, but the variety has evidently arisen from the attempts of Frenchmen and Englishmen to represent, each as he best could, a native vocable which had previously not been reduced to writing. The same variety, and from the same cause, occurs in a multitude of other aboriginal terms.

It did not chance to enter into the poet Longfellow's plan to lay the scene of any portion of his song of Hiawatha in the Lake Simcoe region. The legends gathered by him

From the great lakes of the Northland,
From the mountains, moors and fenlands,
Where the heron, the Shuh-shuh-gah,
Feeds among the reeds and rushes—

tell of an era just anterior to the period when that district becomes invested with interest for us. Francis Parkman, however, in an agreeably written work, entitled "The Jesuits in North America in the Seventeenth Century," has dwelt somewhat at length on the history of the locality referred to—the well-peopled Toronto region, of which we obtain a kind of Pisgah-view from the brow of the Ridges as we travel north. In the early Reports of the Jesuit fathers themselves, too, this area figures largely. They, in fact, constructed a map of the locality, which must have led the central mission-board of their association, at Rome, to believe that this portion of Western Canada was as thickly strewn with villages and towns as a district of equal area in old France. In the "Chorographia Regionis Huronum," attached to Father du Creux's Map of New France, of the date 1660, given in Bressani's Abridgment of the Relations, we have the following places conspicuously marked as stations or sub-missions in the peninsula bounded by the bays and lakes and rivers above enumerated, implying population in and round each of them:—St. Xavier, St. Charles, St. Louis, St. Ignatius, St. Denis, St. Joachim, St. Athanasius, St. Elizabeth, St. John the Baptist, St. Joseph, St. Mary, St. Michael, La Conception, St. Mary Magdalene, and others.

In Schoolcraft's American Indians, p. 130, ed. 1851, the scene of the story of Aingodon and Naywadaha is laid at Toronto, by which is meant probably a spot close to Lake Simcoe, and not the trading-post of Toronto on Lake Ontario.

LIV.—YONGE STREET, FROM THE SUMMIT TO THE RIDGES OF THE NEW-MARKET ROAD.

But we must push on. The end of our journey is in sight. The impediments to our advance have been innumerable, but unavoidable. In spite of appearances, "Semper ad eventum festina" has all along been secretly goading us forward.

The farmhouses and their surroundings in the Quaker settlement through which, after descending faom the Ridges on the northern side, we passed, came to be notable at an early date for a characteristic neatness, completeness, and visible judiciousness; and for an air of enviable general comfort and prosperity. The farmers here were emigrants chiefly from Pennsylvania. Coming from a quarter where large tracts had been rapidly transformed by human toil from a state of nature to a condition of high cultivation, they brought with them an inherited experience in regard to such matters; and on planting themselves down in the midst of an unbroken wild, they regarded the situation with more intelligence perhaps than the ordinary emigrant from the British Islands and interior of Germany, and so, unretarded by blunders and by doubts as to the issue, were enabled very speedily to turn their industry to profitable account.

The old *Gazetteer* of 1799 speaks in an exalted sentimental strain of an emigration then going on from the United States into Canada. "The loyal peasant," it says, "sighing after the government he lost by the late revolution, travels from Pennsylvania in search of his former laws and protection; and having his expectations fulfilled by new marks of favour from the Crown in a grant of lands, he turns his plough at once into these fertile plains (the immediate reference is to the neighbourhood of Woodhouse on Lake Erie), and an abundant crop reminds him of his gratitude to his God and to his king." We do not know for certain whether the Quaker settlers of the region north of the Ridges came into Canada under the influence of feelings exactly such as those described by the *Gazetteer* of 1799. In 1806, however, we find them coming forward in a body to congratulate a new Lieutenant-Governor on his arrival in Upper Canada. In the *Gazette* of Oct. 4, 1806, we read: "On Tuesday, the 30th September (1806), the following address from the Quakers residing on Yonge Street was presented to his Excellency the Lieutenant-Governor: "The Society of the people called Quakers, to Francis Gore, Governor of Upper Canada, sendeth greeting. Notwithstanding we are a people who hold forth to the world a principle which in many respects differs from the greater part of mankind, yet we believe it our reasonable duty, as saith the Apostle, 'Submit yourselves unto every ordinance of man for the Lord's sake, whether it be the king as supreme, or unto gover-

nors as unto them that are sent by him for the punishment of evil doers, and for the praise of them that do well:' in this we hope to be his humble and peaceful subjects. Although we cannot for conscience sake join with many of our fellow-mortals in complimentary customs of man, neither in taking up the sword in order to shed human blood—for the Scripture saith that 'it is righteousness that exalteth a nation, but sin is a reproach to any people'—we feel concerned for thy welfare and the prosperity of the province, hoping thy administration may be such as to be a terror to the evil-minded and a pleasure to them that do well: then will the province flourish and prosper under thy direction; which is the earnest desire and prayer of thy sincere friends.—Read and approved in Yonge Street monthly meeting, held the 18th day of the ninth month, 1806. Timothy Rogers and Amos Armitage are appointed to attend on the governor therewith. Signed by order of the said meeting, Nathaniel Pearson, clerk."

To this address, characteristic alike in the peculiar syntax of its sentences and in the well-meant platitudes to which it gives expression, his Excellency was pleased to return the following answer: "I return you my thanks for your dutiful address and for your good wishes for my welfare and prosperity of this province. I have no doubt of your proving peaceful and good subjects to his majesty, as well as industrious and respectable members of society. I shall at all times be happy to afford to such persons my countenance and support. Francis Gore, Lieut.-Governor. Government House, York, Upper Canada, 30th Sep., 1806."

The Timothy Rogers here named bore a leading part in the first establishment of the Quaker settlement. He and Jacob Lundy were the two original managers of its affairs. On the arrival of Governor Peter Hunter, predecessor to Gov. Gore, Timothy Rogers and Jacob Lundy with a deputation from the settlement, came into town to complain to him of the delay which they and their co-religionists had experienced in obtaining the patents for their lands.

Governor Hunter, who was also Commander-in-Chief and a Lieut.-General in the army, received them in the garrison: and after hearing how on coming to York on former occasions they had been sent about from one office to another for a reply to their inquiries about the patents, he requested them to come to him again the next day at noon. Orders were the same instant despatched to Mr. D. W. Smith, the Surveyor-General, to Mr. Small, Clerk of the Executive Council, to Mr. Burns, Clerk of the Crown, and to Mr. Jarvis, Secretary and Registrar of the Province (all of whom it appeared at one time or another had failed to reply satisfactorily to the Quakers), to wait at the same hour on the Lieut.-Governor, bringing with them, each respectively, such papers and memoranda as might be in their possession, having relation to patents for lands in Whitchurch and King.

Governor Hunter had a reputation for considerable severity of character; and all functionaries, from the judge on the bench to the humblest employé, held office in those days very literally during pleasure.

"These gentlemen complain,"—the personages above enumerated having assembled together with the deputation from Yonge Street—"These gentlemen complain," the Governor said, pointing to the Quakers, "that they cannot get their patents."

Each of the official personages present offered in succession some indistinct observations; expressive it would seem of a degree of regret, and hinting exculpatory reasons, so far as he individually was concerned.

On closer interrogation, one thing however came out very clear, that the order for the patents was more than twelve months' old.

At length the onus of blame seemed to settle down on the head of the Secretary and Registrar, Mr. Jarvis, who could only say that really the pressure of business in his office was so great that he had been absolutely unable, up to the present moment, to get ready the particular patents referred to.

"Sir!" was the Governor's immediate rejoinder, "if they are not forthcoming, every one of them, and placed in the hands of these gentlemen here in my presence at noon on Thursday next (it was now Tuesday), by George! I'll un-Jarvis you!"—implying, as we suppose, a summary congé from office.

It is needless to say that Mr. Rogers and his colleagues of the deputation carried back with them to Whitchurch lively accounts of the vigour and rigour of the new Governor—as well as their patents.

General Hunter was very peremptory in his dismissals occasionally. In a *Gazette* of July 16, 1803, is to be seen an ominous announcement that the Governor is going to be very strict with

the Government clerks in regard to hours: "Lieut.-Governor's office, 21st June, 1803. Notice is hereby given that regular attendance for the transaction of the public business of the Province will in future be given at the office of the Secretary of the Province, the Executive Council office, and the Surveyor-General's office, every day in the year (Sundays, Good Friday, and Christmas day only excepted) from ten o'clock in the morning until three in the afternoon, and from five o'clock in the afternoon until seven in the evening. By order of the Lieutenant-Governor, Jas. Green, Secretary."

Soon after the appearance of this notice, it happened one forenoon that young Alexander Macnab, a clerk in one of the public offices, was innocently watching the Governor's debarkation from a boat, preparatory to his being conveyed up to the Council-chamber in a sedan-chair which was in waiting for him. The youth suddenly caught his Excellency's eye, and was asked —"What business he had to be there? Did he not belong to the Surveyor-General's office? Sir! your services are no longer required!"

For this same young Macnab, thus summarily dismissed, Governor Hunter, we have been told, procured subsequently a commission. He attained the rank of captain and met a soldier's fate on the field of Waterloo, the only Upper Canadian known to have been engaged or to have fallen in that famous battle. (So late as 1862 Capt. Macnab's Waterloo medal was presented, by the Duke of Cambridge personally, to the Rev. Dr. Macnab, of Bowmanville, nephew of the deceased officer.)

Two stray characteristic items relating to Governor Hunter may here be subjoined. The following was his brief reply to the Address of the Inhabitants of York on his arrival there in 1799. "Gentlemen: Nothing that is in my power shall be wanting to contribute to the happiness and welfare of this colony." (*Gazette*, Aug. 24, 1799.) At Niagara, an Address from "the mechanics and husbandmen" was refused by him, on the ground that an address professedly from the inhabitants generally had been presented already. On this, the *Constellation* of Sep. 10, (1799), prints the following "anecdote," which is a hit at Gov. Hunter. "Anecdote.—When Governor Simcoe arrived at Kingston on his way here to take upon him the government of the Province, the magistrates and gentlemen of that town presented him with a very polite address. It was politely and verbally answered. The inhabitants of the country and town, who move not in the upper circles, presented theirs. And this also his Excellency very politely answered, and the answer being in writing, is carefully preserved to this day."

Among the patents carried home by Mr. Timothy Rogers, above named, were at least seven in which he was more or less personally interested. His own lot was 95 on the west or King side of Yonge Street. Immediately in front of him on the Whitchurch or east side, on lots 91, 92, 93, 94, 95, and 96, all in a row, were enjoyed by sons or near relatives of his, bearing the names respectively of Rufus Rogers, Asa Rogers, Isaac Rogers, Wing Rogers, James Rogers, and Obadiah Rogers.

Mr. Lundy's name does not appear among those of the original patentees; but lots or portions of lots in the "Quaker Settlement" are marked at an earlier period with the names of Shadrach Lundy, Oliver Lundy, Jacob Lundy, Reuben Lundy, and perhaps more.

In the region just beyond the Ridges there were farmers also of the community known as Mennonists or Tunkers. Long beards, when such appendages were rarities, dangling hair, antique-shaped, buttonless, home-spun coats, and wide-brimmed low-crowned hats, made these persons conspicuous on the street. On the seat of a loaded country-waggon, or on the back of a solitary rustic nag, would now and then be seen a man of this community, who might pass for John Huss or John à Lasco, as represented in the pictures. It was always curious to gaze upon these waifs and strays from old Holland, perpetuating, or at least trying to perpetuate, on a new continent, customs and notions originating in the peculiar circumstances of obscure localities in another hemisphere three hundred years ago.

Simon Menno, the founder and prophet of the Mennonists, was a native of Friesland in 1496. He advocated the utmost rigour of life. Although there are, as we are informed, modernized Mennonists now in Holland, at Amsterdam for example, who are distinguished for luxury in their tables, their equipages and their country-seats, yet a sub-section of the community known as Uke-Wallists, from one Uke Walles, adhere to the primitive strictness enjoined by Menno. Their apparel, we are told, is mean beyond expression, and they avoid everything that has the most distant appearance of elegance or ornament. They let their beards grow to an enormous length; their hair, uncombed, lies in a disorderly manner on their shoulders; their

countenances are marked with the strongest lines of dejection and melancholy; and their habitations and household furniture are such as are only fitted to answer the demands of mere necessity. "We shall not enlarge," Mosheim adds, "upon the circumstances of their ritual, but only observe that they prevent all attempts to alter or modify their religious discipline, by preserving their people from everything that bears the remotest aspect of learning and science; from whatever, in a word, may have a tendency to enlighten their devout ignorance."

The sympathies of our primitive Tunkers beyond the Ridges were, as we may suppose, with this section of the fatherland Mennonists.

Thus, to get the clue to social phenomena which we see around us here in Canada, we have to concern ourselves occasionally with uninviting pages, not only of Irish, Scottish and English religious history, but of German and Netherlandish religious history likewise. Pity 'tis, in some respects, that on a new continent our immigrants could not have made a *tabula rasa* of the past, and taken a start *de novo* on another level—a higher one; on a new guage—a widened one.

Though only a minute fraction of our population, an exception was early made by the local parliament in favour of the Mennonists or Tunkers, allowing them to make affirmations in the Courts, like the Quakers, and to compound for military service.—Like Lollard, Quaker and some other similar terms, Tunker, *i.e.* Dipper, was probably at first used in a spirit of ridicule.

LV.—YONGE STREET: DIGRESSION TO NEWMARKET AND SHARON.

When Newmarket came in view off to the right, a large portion of the traffic of the street turned aside for a certain distance out of the straight route to the north, in that direction.

About this point the ancient dwellers at York used to take note of signs that they had passed into a higher latitude. Half a degree to the south of their homes—at Niagara, for example—they were in the land, if not of the citron and myrtle, certainly of the tulip-tree and pawpaw—where the edible chestnut grew plentifully in the natural woods, and the peach luxuriantly flourished.

Now, half a degree the other way, in the tramontane region north of the Ridges, they found themselves in the presence of a vegetation that spoke of an advance, however minute, towards the pole. Here, all along the wayside, beautiful specimens of the spruce-pine and balsam-fir, strangers in the forest about York, were encountered. Sweeping the sward with their drooping branches and sending up their dark green spires high in the air, these trees were always regarded with interest, and desired as graceful objects worthy to be transferred to the lawn or ornamental shrubbery.

A little way off the road, on the left, just before the turn leading to Newmarket, was the great Quaker meeting-house of this region—the "Friends' Meeting-house"—a building of the usual plain cast, generally seen with its solid shutters closed up. This was the successor of the first Quaker meeting-house in Upper Canada. Here Mr. Joseph John Gurney, the eminent English Quaker, who travelled on this continent in 1837–40, delivered several addresses, with a view especially to the re-uniting, if possible, of the Orthodox and the Hicksites.

Gourlay, in his "Statistical Account of Upper Canada," took note that this Quaker meeting-house and a wooden chapel at Hogg's Hollow, belonging to the Church of England, were the only two places of public worship to be seen on Yonge Street between York and the Holland Landing—a distance, he says, of nearly forty miles. This was in 1817.

Following now the wheel-marks of clearly the majority of vehicles travelling on the street, we turn aside to Newmarket.

Newmarket had for its germ or nucleus the mills and stores of Mr. Elisha Beaman, who emigrated hither from the State of New York in 1806. Here also, on the branch of the Holland river, mills at an early date were established by Mr. Mordecai Millard, and tanneries by Mr. Joseph Hill. Mr Beaman's mills became subsequently the property of Mr. Peter Robinson, who was Commissioner of Crown Lands in 1827, and one of the representatives of the united counties of York and Simcoe; and afterwards, the property of his brother, Mr. W. B. Robinson, who for a time resided here, and for a number of years represented the County of Simcoe in the provincial parliament. Most gentlemen travelling north or to the north-west brought with them, from friends in York, a note of commendation to Mr. Robinson, whose friendly and hospitable disposition were well known:

"Fast by the road his ever-open door
Oblig'd the wealthy and reliev'd the poor."

Governors, commodores, and commanders-in-chief, on their tours of pleasure or duty, were glad to find a momentary resting-place at a refined domestic fireside. Here Sir John Franklin was entertained for some days in 1835: and at other periods, Sir John Ross and Capt. Back, when on their way to the Arctic regions. In 1847, Mr. W. B. Robinson was Commissioner of Public Works; and, at a later period, one of the Chief Commissioners of the Canada Company. Mr. Peter Robinson was instrumental in settling the region in which our Canadian Peterborough is situated, and from him that town has its name.

At Newmarket was long engaged in prosperous business Mr. John Cawthra, a member of the millionaire family of that name. Mr. John Cawthra was the first representative in the Provincial Parliament of the County of Simcoe, after the separation from the County of York. In 1812, Mr. John Cawthra and his brother Jonathan were among the volunteers who offered themselves for the defence of the country. Though by nature inclined to peace, they were impelled to this by a sincere sense of duty. At Detroit, John assisted in conveying across the river in scows the heavy guns which were expected to be wanted in the attack on the Fort. On the slopes at Queenston, Jonathan had a hair-breadth escape. At the direction of his officer, he moved from the rear to the front of his company, giving place to a comrade, who the following instant had a *portion of his leg carried away by a shot from Fort Gray, on the opposite* side of the river. Also at Queenston, John, after personally cautioning Col. Macdonell against rashly exposing himself, as he seemed to be doing, was called on a few moments afterwards, to aid in carrying that officer to the rear, mortally wounded.

With Newmarket too is associated the name of Mr. William Roe, a merchant there since 1814, engaged at one time largely in the fur-trade. It was Mr. Roe who saved from capture a considerable portion of the public funds, when York fell into the hands of General Dearborn and Commodore Chauncey in 1813. Mr. Roe was at the time an employé in the office of the Receiver General, Prideaux Selby; and by the order of General Sheaffe and the Executive Council he conveyed three bags of gold and a large sum in army-bills to the farm of Chief Justice Robinson, on the Kingston road east of the Don bridge, and there buried them. The army-bills were afterwards delivered up to the enemy; but the gold remained secreted until the departure of the invaders, and was handed over to the authorities in Dr. Strachan's parlour by Mr. Roe. The Receiver General's iron chest was also rescued by Mr. Roe and deposited in the premises of Mr. Donald McLean, Clerk of the House of Assembly. Mr. McLean was killed while bravely opposing the landing of the Americans, and his house was plundered; the strong chest was broken open and about one thousand silver dollars were taken therefrom.

The name of Mr. Roe's partner at Newmarket, Mr. Andrew Borland, is likewise associated with the taking of York in 1813. He was made prisoner in the fight, and in the actual struggle *against capture he received six severe rifle wounds, from the effects of which he never* wholly recovered. He had also been engaged at Queenston and Detroit. In the Report of the Loyal and Patriotic Society of Upper Canada, we have an entry made of a donation of sixty dollars to Mr. Andrew Borland on the 11th June, 1813, with the note appended: "The committee of the Loyal and Patriotic Society voted this sum to Mr. Borland for his patriotic and eminent services at Detroit, Queenston and York, at which latter place he was severely wounded." We also learn from the Report that Mr. D'Arcy Boulton had presented a petition to the Society in favour of Mr. Borland. The members of committee present at the meeting held June 11th, 1813, were Rev. Dr. Strachan, chairman, Wm. Chewett, Esq., Wm. Allan, Esq., John Small, Esq., and Alex. Wood, Esq., secretary: and the minutes state that "The petition of D'Arcy Boulton, Esq., a member of the Society, in favour of Andrew Borland, was taken into consideration, and the sum of Sixty Dollars was voted to him, on account of his patriotic and eminent services at Detroit, Queenston and York, at which latter place he was most severely wounded." Mr. Borland had been a clerk in Mr. Boulton's store. In the order to pay the money, signed by Alexander Wood, Mr. Borland is styled "a volunteer in the York Militia." He afterwards had a pension of Twenty Pounds a year. In 1838 his patriotic ardour was not quenched. During the troubles of that period he undertook the command of 200 Indians who had volunteered to fight in defence of the rights of the Crown of England, if there should be need. They were stationed for a time at the Holland Landing, but their services were happily *not required.*

From being endowed with great energy of character, and having also a familiar knowledge of the native dialects, Mr. Borland had great influence with the Indian tribes frequenting the coasts of Lakes Huron and Simcoe. Mr. Roe likewise, in his dealings with the aborigines, had acquired a considerable facility in speaking the Chippewa dialect, and had much influence among the natives.

Let us not omit to record, too, that at Newmarket, not very many years since, was successfully practising a grandson of Sir William Blackstone, the commentator on the Laws of England—Mr. Henry Blackstone, whose conspicuous talents gave promise of an eminence in his profession not unworthy of the name he bore. But his career was cut short by death.

The varied character of colonial society, especially in its early crude state, the living elements mixed up in it, and the curious changes and interchanges that take place in the course of its development and consolidation, receive illustrations from ecclesiastical as well as civil annals. We ourselves remember the church-edifice of the Anglican communion at Newmarket when it was an unplastered, unlathed clap-board shell, having repeatedly officiated in it while in that stage of its existence. Since then the congregation represented by this clap-board shell have had as pastors men like the following: a graduate of Trinity College, Dublin, not undistinguished in his university, a protegé of the famous Archbishop Magee, a co-worker for a time of the distinguished Dr. Walter Farquhar Hook of Leeds, and minister of one of the modern churches there—the Rev. Robert Taylor, afterwards of Peterborough here in Canada. And since his incumbency, they have been ministered to by a former vicar of a prominent church in London, St. Michael's, Burleigh Street, a dependency of St. Martin's in Trafalgar Square—the Rev. Septimus Ramsay, who was also long the chief secretary and manager of a well known Colonial Missionary Society which had its headquarters in London. While, on the other hand, an intervening pastor of the same congregation, educated for the ministry here in Canada and admitted to Holy Orders here, was transferred from Newmarket first to the vicarage of Somerton in Somersetshire, England, and, secondly, to the rectory of Clenchwarden in the county of Norfolk in England—the Rev. R. Athill. And another intervening incumbent was, after having been also trained for the ministry and admitted to orders here in Canada, called subsequently to clerical work in the United States, being finally appointed one of the canons of the cathedral church at Chicago, by Bishop Whitehouse of Illinois: this was the Rev. G. C. Street, a near relative of the distinguished English architect of that name, designer and builder of the New Law Courts in London.

As to the name "Newmarket"—in its adoption there was no desire to set up in Canada a memorial of the famous English Cambridgeshire racing town. The title chosen for the place was an announcement to this effect: "Here is an additional mart for the convenience of an increased population: a place where farmers and others may purchase and exchange commodities without being at the trouble of a journey to York or elsewhere." The name of the Canadian Newmarket, in fact, arose as probably that of the English Newmarket itself arose, when first established as a newly-opened place of trade for the primitive farmers and others of East Anglia and Mercia in the Anglo-Saxon period.

It deserves to be added that the English church at Newmarket was, a few years back, to some extent endowed by a generous gift of valuable land made by Dr. Berwick, a bachelor medical man, whose large white house on a knoll by the wayside was always noted by the traveller from York as he turned aside from Yonge Street for Newmarket.

Proceeding onwards now from Newmarket, we speedily come to the village of Sharon (or Hope as it was once named), situated also off the direct northern route of Yonge Street.

David Willson, the great notability and founder of the place, had been in his younger days a sailor, and, as such, had visited the Chinese ports. After joining the Quakers, he taught for a time amongst them as a schoolmaster. For some proceeding of his, or for some peculiarity of religious opinion, difficult to define, he was cut off from the Hicksite sub-division of the Quaker body. He then began the formation of a denomination of his own. In the bold policy of giving to his personal ideas an outward embodiment in the form of a conspicuous Temple, he anticipated the shrewd prophets of the Mormons, Joseph and Hiram Smith. Willson's building was erected about 1825. Nauvoo was not commenced until the spring of 1840.

In a little pamphlet published at Philadelphia in 1815, Willson gives the following account of himself: "I, the writer," he says, "was born of Presbyterian parents in the county of Duchess, state of New York, in North America. In 1801 I removed with my family into this

province (Upper Canada), and after a few years became a member of the Society of the Quakers at my own request, as I chose a spiritual people for my brethren and sisters in religion. But after I had been a member thereof about seven years, I began to speak something of my knowledge of God or a Divine Being in the heart, soul or mind of man, all which signifies the same to my understanding,—but my language was offensive, my spirit was abhorred, my person was disdained, my company was forsaken by my brethren and sisters. After which I retired from the society and was disowned by them for so doing; but several retired with me and were disowned also, because they would not unite in the disowning and condemning the fruits of my spirit; for, as I had been accounted a faithful member of the society for many years, they did not like to be hasty in condemnation. Therefore we became a separate people, and assembled ourselves together under a separate order which I immediately formed. After I retired from my former meetings—as our discipline led to peace with all people more than any one in my knowledge—we called ourselves Children of Peace, because we were but young therein."

The following account of the Temple erected by Willson at Sharon is by a visitor to the village in 1835. "The building," says Mr. Patrick Shirreff in his "Tour through North America," published in Edinburgh in 1835, "is of wood painted white externally, seventy feet high; and consists of three storeys. The first is sixty feet square, with a door in the centre of each side and three large windows on each side of the door. On two sides there is a representation of the setting sun and the word 'Armageddon' inscribed below. The second storey is twenty-seven feet square with three windows on each side; and the third storey nine feet square with one window on each side."

"The corners of each of the storeys are terminated by square lanterns, with gilded mountings; and the termination of the building is a gilded ball of considerable size. The interior was filled with wooden chairs placed round sixteen pillars in the centre of which is a square cabinet of black walnut with a door and windows on each side. There was a table in the centre of the cabinet covered with black velvet, hung with crimson merino and fringe, in which was deposited a Bible. On the four central pillars were painted the words Faith, Hope, Charity, and Love; and on the twelve others, the names of the Apostles. The central pillars seemed to support the second storey; and at the foot of each was a table covered with green cloth. The house was without ornament, being painted fawn, green and white; and had not a pulpit or place for addressing an audience. It is occupied only once a month for collecting charity; and contains 2952 panes of glass, and is lighted once a year with 116 candles."

The materials of the frame-work of the Temple were, as we have been told, prepared at a distance from the site, and run rapidly up as far as possible without noise, in imitation of the building of Solomon's Temple. By the side of the principal edifice stood a structure 100 feet by 50 feet, used for ordinary meetings on Sundays. On the first Friday in September used to be an annual feast, when the Temple was illuminated. In this was an organ built by Mr. Coates of York.

David was an illiterate mystic, as his writings shew, in which, when the drift of his maundering is made out, there is nothing new or remarkable to be discerned.

At the close of the war of 1812-13-14, he appears to have been under the impression that the Government designed to banish him as a seditious person, under c. 1. 44 Geo. III. He accordingly published a document deprecating such action. It was thus headed: "Address to thy Crown, O England, and thy great name. I write as follows to all the inhabitants thereof." In the course of it he says: "After I have written, I will leave God to judge between you and me; and also to make judges of you, whether you will receive my ministry in your land in peace, yea or nay. .. .. Ye are great indeed. I can't help that, neither do I want to; but am willing ye should remain great in the sight of God, although I am but small therein, in the things thereof. Now choose whether I should or might be your servant in these things, yea or nay. As I think, it would be a shame for a minister to be banished from your nation for preaching the gospel of peace therein. I am a man," he continues, "under the visitation of God's power in your land; and many scandalous reports are in circulation against me. The intent of the spirit of the thing is to put me to flight from your dominions, or that I should be imprisoned therein. For which cause I, as a dutiful subject, make myself known hereby unto you of great estate in the world, lest your minds should be affected and stirred up against me without a cause by your inferiors, who seek to do evil to the works of God, whenever the Almighty is trying to do you good."

In some verses of the same date as this address to the home authorities, viz., 1815, he refers to the peril h supposed himself to be in. A stanza or two will suffice as a specimen of his poetical productions, which are all of the same Sternhold and Hopkins type, with the disadvantage of great grammatical irregularity. Thus he sings: (The tone of the *ci-devant* Jack-tar is perhaps to be slightly detected.)

The powers of hell are now combin'd—
With war against me rage;
But in my God my soul's resigned—
The rock of every age, &c.

Some thou doth set in king's estate,
And some on earth must serve;
And some hath gold and silver plate,
When others almost starve, &c.

The earth doth hunger for my blood,
And Satan for my soul;
And men my flesh for daily food,
That they may me control, &c.

If God doth give what I receive
The same is due to thee;
And thou in spirit must believe
In gospel liberty, &c.

It's also mine, by George our king,
The ruler of my day;
And yet if I dishonour bring,
Cut short my feeble stay, &c.

For this is in your hearts to do,
Ye inferiors of the earth:
And it's in mine to do so too,
And stop that cursed birth, &c.

The style of the volume entitled "Impressions," which used to be sold or given away to visitors in the Temple, does not rise much above the foregoing, either in its verse or prose. What Mosheim says of Menno's books, may be said with at least equal truth of Willson's: "An excessively diffuse and rambling style, frequent and unnecessary repetitions, an irregular and confused method, with other defects of equal moment, render the perusal of the productions highly disagreeable." Nevertheless, the reduction of his solitary meditations to writing had, we may conceive, a pious operation and effect on Willson's own spirit; and the perusal of them may, in the simple-minded few who still profess to be his followers, have a like operation and effect, even when in the reading constrained, with poor monk Felix, to confess that, though believing, they do not understand.

The worthy man did not win martyrdom nor suffer exile; but lived on in great worldly prosperity here in Sharon, reverenced by his own adherents as a sort of oracle, and flattered by attentions from successive political leaders on account of the influence which he might be supposed locally to possess, down to the year 1866, when he died in peace, aged eighty-nine years and seven months.

Of Willson's periodical missionary expeditions into town, we have spoken in another connexion.

LVI.—YONGE STREET FROM THE NEWMARKET ROAD TO THE LOWER LANDING ON THE HOLLAND RIVER.

We return now to the great northern route, from which we have been deviating, and hasten on with all speed to the Landing. We place ourselves at the point on Yonge Street where we turned off to Newmarket. Proceeding onward, we saw almost immediately, on the left, the conspicuous dwelling of Mr. Irving—the Hon. Jacob Æmilius Irving, a name historical in Canada, a Paulus Æmilius Irving having been Commander-in-Chief of the Forces in British America in 1765, and also President for a time of the Province of Quebec. (This Paulus Æmilius Irving had previously taken part under General Wolfe in the capture of Quebec.) The house of his descendant, Jacob Æmilius Irving, here on Yonge Street, was known as Bonshaw, from some ancient family property in Dumfriesshire. He had been an officer in the 13th Light Dragoons, and was wounded at Waterloo. In addition to many strongly-marked English traits of character and physique, he possessed fine literary tastes and histrionic skill of a high order, favoured by the possession of a grand barytone voice. To the last, *gaudebat in equis* might be said of him. A four-in-hand, guided by himself, issuing from the gates at Bonshaw and whirling along Yonge Street into town, was a common phenomenon. He died at the Falls of Niagara in 1856. Since 1843 Mr. Irving had been a member of the Upper House of United Canada.

A little way back, ere we descended the northern slope of the Ridges we caught sight, as we have narrated, of the Holland River, or at least of some portion of the branch of it with which we are immediately concerned—issuing, "a new-born rill," from one of its fountains.

As we traversed the Quaker settlement it was again seen, a brook meandering through meadows. This was the eastern branch of the river. The main stream lies off to the west,

flowing past the modern Bradford and Lloydtown. It is at the head of the main stream that the most striking approximation of the waters of the Humber and Holland rivers is to be seen.

We arrive now at the Upper Landing, the ancient canoe-landing, and we pause for a moment. Here it was the war-parties and hunting-parties embarked and disembarked, while yet these waters were unploughed by the heavy boats of the white man.

The Iroquois from the south-side of Lake Ontario penetrated the well-peopled region of the Hurons by several routes, as we have already intimated: by the great bay of Quinté highway; by the trails whose termini on Lake Ontario were near respectively the modern Bowmanville and Port Hope; and thirdly by a track which we have virtually been following in this our long ramble from York; virtually, we say, for it was to the west of Yonge Street that the trail ran, following first the valley of the Humber and then that of the main stream of the Holland river. The route which Mr. Holland took when he penetrated from Toronto Bay to the head waters of the river which now bears his name, is marked in the great MS. map which he constructed in 1791. He passed up evidently along the water-course of the Humber.

"You can pass from Lake Frontenac, *i. e.*, Ontario," Lahontan says (ii. 23), "into Lake Huron by the river Tan-a-ou-até (the Humber), by a portage of about twenty-four mills to Lake Toronto, which by a river of the same name empties into Lake Huron," by the River Severn *i. e.*, as we should now speak

In the pre-historic period, then, hunting-parties or war-parties taking to the water here at the Upper Landing would probably be just about to penetrate the almost insular district, of which we have spoken, westward of Lake Simcoe, the Toronto region, the place of concourse, the well-peopled region. But some of them might perhaps be making for the Lake Huron country and North-west generally, by the established trail having its terminus at or near Orillia (to use the modern name).

In the days of the white man, the old Indian place of embarkation and debarkation on the Holland river, acquired the name of the Upper Canoe-landing; and hither the smaller craft continued to proceed.

Vessels of deeper draught lay at the Lower Landing, to which we now move on, about a mile and a half further down the stream. Here the river was about twenty-five yards wide, the banks low and bordered by a woody marsh, in which the tamarac or larch was a conspicuous tree.

In a cleared space on the right, at the point where Yonge Street struck the stream, there were some long low buildings of log with strong shutters on the windows, usually closed. These were the Government depositories of naval and military stores, and Indian presents, on their way to Penetanguishene. The cluster of buildings here was once known as Fort Gwillimbury. Thus we have it written in the old *Gazetteer* of 1799: "It is thirty miles from York to Holland river, at the Pine Fort called Gwillimbury, where the road ends."

Galt, in his Autobiography, speaks of this spot. He travelled from York to Newmarket in one day. This was in 1827. "Then next morning," he says, "we went forward to a place on the Holland river, called Holland's Landing, an open space which the Indians and fur-traders were in the habit of frequenting. It presented to me," he adds, "something of a Scottish aspect in the style of the cottages; but instead of mountains the environs were covered with trees. We embarked at this place." He was on his way to Goderich at the time, viâ Penetanguishene.

The river Holland, at which we have so long been labouring to arrive, had its name from a former surveyor-general of the Province of Quebec, prior to the setting-off of the Province of Upper Canada—Major S. Holland. In the *Upper Canada Gazette* of Feb. 13, 1802, we have an obituary notice of this official personage. His history also, it will be observed, was mixed up with that of General Wolfe. "Died," the obituary says, "on the 28th instant (that is, on the 28th of December, 1801, the article being copied from the *Quebec Gazette* of the 31st of the preceding December), of a lingering illness, which he bore for many years with Christian patience and resignation, Major S. Holland. He had been in his time," the brief memoir proceeds to say, "an intrepid, active, and intelligent officer, never making difficulties, however arduous the duty he was employed in. He was an excellent field-engineer, in which capacity he was employed in the year 1758 at the seige of Louisbourg in the detachment of the army under General Wolfe, who after by his silencing the batteries that opposed our entrance into

the harbour from his own, and setting fire to three ships of the line, and obliging the remainder in a disabled state to haul out of cannon shot, that great officer was enabled by a rapid and unexpected movement to take post within four hundred yards of the town, from whence Major Holland, under his directions, carried on the approaches, destroyed the defences of the town, and making a practicable breach, obliged the enemy to capitulate. He distinguished himself also at the conquest of Quebec in 1759, and was made honourable mention of in Gen. Wolfe's will as a legatee. He also distinguished himself in the defence of Quebec in 1760, after General Murray's unsuccessful attack on the enemy.—After the peace he was appointed Surveyor-General of this Province, and was usefully employed in surveying the American coasts, from which survey those draughts published some years since by Major Debarres have been principally taken."

Major Holland was succeeded in the Surveyor-generalship of Lower Canada by a nephew—the distinguished Colonel Joseph Bouchette. In 1791 Major Holland constructed a map of the British Province of Quebec, on the scale of six inches to the square mile. It exists in MS. in the Crown Land Office of Ontario. It is a magnificent map. On it, Lake Simcoe is left undefined on one side, not having been explored in 1791.

It was in 1832 that the project of a steamer for the Holland river and Lake Simcoe was mooted. We give a document relating to this undertaking which we find in the *Courier* of Feb. 29, in that year, published at York. The names of those who were willing to embark, however moderately, in the enterprise are of interest. It will be observed that the expenditure contemplated was not enormous. To modern speculators in any direction, what a bagatelle seems the sum of £2000!

"Steamboat on Lake Simcoe:" thus runs an advertisement in the *Courier* of Feb. 29, 1832. "Persons who feel interested in the success of this undertaking, are respectfully informed that Capt. McKenzie, late of the *Alciope*, who has himself offered to subscribe one-fourth of the sum required to build the proposed steamboat, is now at Buffalo for the purpose of purchasing an Engine, to be delivered at Holland Landing during the present winter. Capt. McKenzie, who visited Lake Simcoe last summer, is of opinion that a boat of sufficient size and power for the business of the Lake can be built for £1250. In order, however, to ensure success, it is proposed that stock to the amount of £2000 should be subscribed; and it is hoped that this sum will be raised without delay, in order that the necessary steps may be taken, on the return of Capt. McKenzie, to commence building the boat with the view to its completion by the opening of the navigation.—The shares are Twelve Pounds ten shillings each, payable to persons chosen by the Stockholders. The following shares have been already taken up, viz.: The Hon. Peter Robinson, 8 shares; F. Hewson, 1; Edw. O'Brien, 2; W. B. Robinson, 4; W. R. Raines, 4; J. O. Bouchier, 2; Wm. Johnson, 2; John Cummer, 1; T. Mossington, 2; A. M. Raines, 1; Robert Clark, 1; Robert Johnston, 1; M. Mossington, 1; B. Jefferson, 1; J. M. Jackson, 1; R. Oliver, 1; Wm. Turner, 2; L. Cameron, 1; F. Osborne, 2; J. Graham, 1; J. White, 1; S. H. Farnsworth, 1; Andrew Mitchell, 5; Murray, Newbigging and Co., 2; Capt. Creighton, 2; Capt. McKenzie, 40; Canada Company, 8; J. F. Smith, 2; John Powell, 1; Grant Powell, 2; A. Smalley, 1; Samuel P. Jarvis, 1; James E. Small, 1; R. W. Parker, 1; D. Cameron, 1; Capt. Castle, 79th Regt., 8; James Doyle, 2; Francis Phelps, East Gwillimbury, 1; G. Lount, West Gwillimbury, 1; Samuel Lount, West Gwillimbury, 1; George Playter, Whitchurch, 1; Joseph Hewett, 1; Thomas A. Jebb, 2; Charles S. Monck, Haytesbury, 1; G. Ridout, 2; T. G. Ridout, 1; Thomas Radenhurst, 1; Major Barwick, 2; Capt. W. Campbell, 2; C. C. Small, 1; J. Ketchum, 1; Capt. Davies, 2; Lieut. Carthew, 2; Capt. Ross, 1; C. McVittie, 1; Lieut. Adams, 1; S. Washburn, 2; J. C. Godwin, 1; F. T. Billings, 2; Thorne and Parsons, 2; James Pearson, 1; R. Mason, 2; Wm. Laughton, 2; Wm. Ware, 1; A. H. Tonge, 1; Sheldon, Dutcher and Co., 1; Jabez Barber, 1; R. W. Prentice, 1; T. Bell, 1; Lucius O'Brien, 1;—Total, 162 shares. Persons who are desirous of taking shares in this boat are respectfully informed that the subscription paper is lying at the Store of Messrs. Murray, Newbigging and Co., where they can have an opportunity of entering their names. York, 21st Dec., 1831."

The movement here initiated resulted in the steamer *Simcoe*, which plied for some years between the Landing and the ports of Lake Simcoe. The *Simcoe* was built at the Upper Landing, and after being launched, it was necessary to drag the boat by main force down to deep water, through the thick sediment at the bottom of the stream. During the process, while the capstan and tackle or other arrangement was being vigorously worked—instead of

the boat advancing—the land in considerable mass moved bodily towards the boat, like a cake of ice set free from the main floe. Much of the ground and marsh in the great estuary of the Holland river is said to be simply an accumulation of earthy and vegetable matter, resting on water.

The *Simcoe* was succeeded by the *Peter Robinson*, Capt. Bell; the *Beaver*, Capt. Laughton, and other steamers.

Standing on the deck of the *Beaver*, we have ourselves more than once threaded the windings of the Holland river; and we well remember how, like sentient things in a kind of agony, the broad floating leaves of the lilies along its eastern margin writhed and flapped as the waters were drawn away from under them by the powerful action of the wheels in the middle of the stream.

"The navigation of the Holland river," Capt. Bonnycastle observes in his "Canada in 1841," "is very well worth seeing, as it is a natural canal flowing through a vast marsh, and very narrow, with most serpentine convolutions, often doubling on itself. Conceive the difficulty of steering a large steamboat in such a course; yet it is done every day, in summer and autumn, *by means of long poles, slackening the steam*, backing, &c., though very rarely without running a little way into the soft ground of the swamp. The motion of the paddles has, however, in the course of years, widened the channel, and prevented the growth of flags and weeds." We have been told that in the bed of the Holland river, near its mouth, solid bottom was not reached with a sounding-line of 90 feet.

LVII.—YONGE STREET FROM HOLLAND RIVER TO PENETANGUISHENE.

To render our narrative complete, we give in a few parting words some of the early accounts of the route from the Landing, northward as far as Penetanguishene, which, after the breaking up of the establishment on Drummond's island, was for some years the most remote station in Upper Canada where the naval and military power of England was visibly represented.

"After leaving Gwillimbury [i.e., the Landing]," says the *Gazetteer* of 1799, "you enter the Holland river and pass into Lake Simcoe, by the head of Cook's bay, to the westward of which are oak-plains, where the Indians cultivate corn; and on the east is a tract of good land. A few small islands shew themselves as the lake opens, of which Darling's island in the eastern part, is the most considerable. To the westward is a large deep bay, called Kempenfelt's bay, *from the head of which is a short carrying-place to the river Nottawasaga, which empties itself* into the Iroquois bay, in Lake Huron. In the north end of the lake, near the Narrows leading to a small lake is Francis island, between which and the north shore vessels may lie in safety."

It will be proper to make one or two remarks in relation to the proper names here used, which have not in every case been retained.

Cook's bay, it will be of interest to remember, had its name from the great circumnavigator. Kempenfelt's bay recalls the name of the admiral who went down in the Royal George "with twice four hundred men." Darling's island was intended to preserve the name of Gen. Darling, a friend and associate of the first governor; and Francis island bore the name of the same governor's eldest son. Canise island retains its name. The name of another island in this lake, "parallel to Darling's island," is elsewhere given in the *Gazetteer* as Pilkington's island—a compliment to Gen. Pilkington, a distinguished engineer officer. Darling's island, at the present day, is, we believe, known as Snake island: and Francis island and Pilkington's island by other names. Iroquois bay is the same as Nottawasaga bay: the interpretation, in fact, of the term "Nottawasaga," which is the "estuary of the Nodoway"—the great indentation whence often issued on marauding expeditions the canoes of the Nodoway—so the Ochibways called the Iroquois. Lake Simcoe itself, the *Gazetteer of 1799 informs us, was so named* by its first explorer, not in commemoration of himself, but of his father. "Lake Simcoe," we read in a note at p. 138 of the work just named, was "so named by Lieut.-Governor Simcoe in respect to his father, the late Capt. Simcoe of the Royal Navy, who died in the River St. Lawrence on the expedition to Quebec in 1759. In the year 1755, this able officer," the *Gazetteer* adds, "had furnished Government with the plan of operations against Quebec, which then took place. At the time of his death, Capt. Cook, the celebrated circumnavigator, was master of his ship the *Pembroke*." We here see the link of association which led to the application of the great circumnavigator's name to the bay into which the Holland river discharges itself. The Holland itself also, as we have already heard, had its name from a companion of Gen. Wolfe.

We have on this continent no "old poetic mountains," no old poetic objects of any description, natural or artificial, to "breathe enchantment all around." It is all the more fitting, therefore, that we should make the most of the historic memories which, even at second hand, cling to our Canadian local names, here and there.

The old *Gazetteer* next goes on to inform us that "from the bay west of Francis island there is a good path and a short portage into a small lake: this is the nearest way to Lake Huron. The river which falls from Lake Simcoe into Matchedash bay, called the Matchedash river, making a more circuitous passage to the northward and westward"—and Matchedash bay opens out, it afterwards states—"into a larger basin called Gloucester or Sturgeon bay, in the chops of which lies Prince William Henry's island, open to Lake Huron." It is noted also that on a peninsula in this basin some French ruins are still extant: and then it says, "between two larger promontories is the harbour of Penetanguishene, around which is good land for settlement." "Penetanguishene," it is finally added, "has been discovered to be a very excellent harbour."

Again some annotations on names will not be out of place.

Matchedash bay is now Sturgeon bay, and Matchedash river, the river Severn. Both bay and river have a peculiar interest for the people of Toronto, as being respectively the Toronto bay and Toronto river of the old French period. "To the north-east of the French river," Lahontan says (ii. 19), "you see Toronto bay, in which a small lake of the same name empties itself by a river not navigable on account of its rapids." (He elsewhere says this river also bore the name of the lake—Toronto.) The Duke of Gloucester was intended to be complimented in the name Gloucester bay. Prince William Henry's island has not retained its name. When it was imposed, the visit of that prince, afterwards the Duke of Kent and father of the reigning Queen, to Upper Canada, was a recent event.—The French ruins spoken of are the ruins of Fort St. Marie near the mouth of the river Wye—the chief mission-house of the Jesuits, abandoned in *1649, still visible.*

The "good path" and "nearest way to Lake Huron," from the bay west of Francis island, indicates the well-known trail by Coldwater, which was long the chief route to Penetanguishene; and the bay itself, west of Francis island, is the bay known in later times as Shingle bay. In 1834 an attempt was made to found a town at Shingle bay in connexion with the road to Penetanguishene. In a *Courier* of 1834, we have the announcement: "New Town of Innisfallen. Shortly will be offered for sale several building lots in the above new Town, beautifully situated on Shingle Bay, Lake Simcoe. This being the Landing-place for the trade to Penetanguishene and the northern townships," the advertisement goes on to say, "persons inclined to speculate in trade or business of any description will find this a peculiarly valuable situation, as the townships are settled with persons of respectability and capital. It will command the trade to and from the lake. Further particulars can be obtained by application to Wm. Proudfoot, Esq, or from P. Handy, auctioneer, or Francis Hewson, Esq, Lake Simcoe. April 1st, 1834"

Innisfallen, however, did not mature into a town. Orillia, just within the narrows, appears to have been a site more suited to the needs or tastes of the public.

At p. 154, in the article on Yonge Street, the old *Gazetteer* of 1799 speaks again of the portage from Lake Simcoe to Lake Huron, viâ Coldwater, and calls it "a continuation of Yonge Street." It then adds the prediction, which we have once before quoted, that "the advantage would certainly be felt in the future of transporting merchandize from Oswego to York, and from thence across Yonge Street and down the waters of Lake Simcoe into Lake Huron, in preference to sending it by Lake Erie." And in the article on "Lac aux Claies," i. e. as we have already heard, Lake Simcoe, it is curiously stated—this is before the year 1799—that "a vessel is now building for the purpose of facilitating the communication by that route,"—but it is not said where.

A "continuation of Yonge Street" in a more perfect sense, was, at a later period, surveyed and partially opened by the military authorities, from Kempenfelt or Shanty bay near Barrie, in a direct line to Penetanguishene; but the natural growth of the forest had in a great degree filled up the track.

In 1847, however, through the instrumentality of the Commissioner of Public Works of the day, the Hon. W. B. Robinson, the highway in question, sixty-six feet in width and thirty miles in length, was thoroughly cleared out and made conveniently practicable for general travel.

This grand avenue is almost in a direct line with Yonge Street, after the traverse of Lake Simcoe from the Landing has been accomplished.

Penetanguishene, indeed, as a port, no longer requires such an approach as this. The naval and military depôt which existed there has been abolished: and Collingwood, since it has been made the primary terminus on Lake Huron of the Northern Railway of Canada, is the place of resort for the steamers and shipping of the upper lakes.

Nevertheless, the fine highway referred to yields permanently to the inhabitants of Vespra and Oro, Flos and Medonte, Tiny and Tay, the incalculable advantage of easy communication with each other and markets to the south,—the same advantage that Yonge Street yielded to the settlers of Vaughan and Markham, King and Whitchurch, and the two townships of Gwillimbury, in the primitive era of their local history.

It is, however, not improbable that Penetanguishene itself will again acquire importance when hereafter properly connected with our railway system, now so surely advancing to the north shore of Lake Huron: thence to push on to the North-West.

Dr. Thomas Rolph, in his Statistical Account of Upper Canada, appended to his book on the West Indies and United States, spoke in 1836 of the region which we have now reached, thus: "The country about Penetanguishene on Lake Huron is remarkably healthy: the winter roads to it, crossing Lake Simcoe, excellent. In the summer months," he says, "it is delightful to persons who are pleased and entertained by the wild grandeur and simplicity of nature. The pure and transparent waters of the beautiful bay, and the verdant foliage of the vast woods on the east side of the harbour, form a very picturesque scene."

Capt. Bonnycastle visited Penetanguishene in 1841. He was present at one of the periodical distributions of government presents to the Indians. A great concourse of the native people, from far and near, were assembled on the occasion. *Under such circumstances,* Penetanguishene and its surroundings must have presented a peculiarly interesting appearance.

"I happened to be at Penetanguishene," Capt. Bonnycastle says, "when the unfortunate Pou-tah-wah-tamies and nearly two thousand other Indians arrived there, the latter to receive their annual gifts, the former to implore protection. [They had been recently removed from their lands in the United States by the U. S. authorities.] I had never seen the wild and *heathen Indians before,*" the Captain observes, "and *shall never forget the impression their* appearance, on an August evening, with everything beautiful in the scene around, made upon me. To do honour to the commandant of the British port and his guests, these warlike savages selected for the conference a sloping green field in front of his house whose base was washed by the waters of the Huron, which exhibited the lovely expanse of the basin, with its high and woody background, and the single sparkling islet in the middle. No spot could have been imagined more suitable. Behind it rose the high hill which, cleared of timber, is dotted here and there with the neat dwellings of the military residents." He then describes the dresses of the Indians, their painted faces, their war-dances, &c.

"The garrison," he says, "is three miles from the village, and *is always called the Establishment*; and in the forest between the two places is a new church built of wood, very small, *but sufficient for the Established Church,* as it is sometimes called, of that portion of Canada. A clergyman is constantly stationed here for the army, navy, and civilians."

In regard to the provisions supplied to the soldiers and others, Capt. Bonnycastle has the following remarks: "A farmer [Mr. Mairs, as we presume] on the Penetanguishene road has introduced English breeds of cattle and sheep of the best kind. He was, and perhaps still is," he says, "the contractor for the troops, and his stock is well worth seeing. Thus the garrison *is constantly supplied with finer meat than any other station in Canada, although more* out of the world and in the wilderness, than any other; and, as fish is plentiful, the soldiers and sailors of Queen Victoria in the Bay of the White Rolling Sand live well." Penetanguishene means "the place of the falling sands:" the reference being to a remarkable sandy cliff which has been crumbling away from time immemorial, on the western side of the entrance to the harbour.

We have a notice of *Penetanguishene in 1846,* in a volume of Travels in Canada, by the Rev. A. W. H. Rose, published in 1849. "Penetanguishene," the writer says, "is situated at the bottom of a bay extremely shallow on one side, and is a small military and naval station, the latter force consisting of two iron war-steamers, of about sixty-horse power each. There is said to be a nice little society in this (until lately) out-of-the-way station of Upper Canada.

The probability is, however," remarks the same writer, "that it will, as a naval and military depôt, have to be eventually shifted to Owen's Sound, where there is a military reserve specially retained in the survey, as, from the number of shoals about Penetanguishene, the islands, &c., the harbour is said generally to close up with ice three weeks earlier, and to continue shut three weeks later than at the Sound."

A diagram in the *Canadian Journal* (i. 225), illustrating a paper by Mr. Sandford Fleming, shews the remarkable terraced character of the high banks of the harbour of Penetanguishene. "There are appearances in various parts of this region," Mr. Fleming says, "that lead us to infer that the waters of Lake Huron, like those of Ontario, formerly stood at higher levels than they at present occupy Parallel terraces and ridges of sand and gravel can be traced at different places winding round the heads of bays and points of high land with perfect horizontality, and resembling in every respect the present lake beaches. One of them particularly strikes the attention in the bay of Penetanguishene, at a height of about seventy feet above the level of the lake. It can be seen distinctly on either side from the water, or by a spectator standing on one bank while the sun shines obliquely on the other, so as to throw the deeper parts of the terrace in shadow." Mr. Fleming then gives a section "sketched from a cutting a little below Jeffery's Tavern in the village of Penetanguishene, serving to shew the manner in which the soil has been removed from the side hill and deposited in a position formerly under water by the continued mechanical action of the waves. Not only does the peculiar stratification of the lower part of the terrace confirm the supposition that it was deposited on the shore of the ancient lake, but the fact that such excavations have been made in this land-locked position, where the waves could never have had much force, goes far to prove that the lake stood for a long period at this high level." (From the successive subsidences here spoken of by Mr. Fleming, the island known as the Giant's Tomb, in the entrance to Georgian Bay has its peculiar appearance, viz., that of a colossal grave elevated on a high platform or pedestal.)

In 1827, John Galt, the well-known writer, had been at Penetanguishene. He was on his way from York to make an exploration of the lake Huron west of the Canada Company's Huron tract, from Cabot's head in the north to the Riviere aux Sables in the south. For this purpose, a Government vessel, the *Bee*, lying in Penetanguishene harbour, had been placed at his disposal. In his Autobiography he gives the following incidents of his journey from the shore of Kempenfelt bay. "About half-way to Penetanguishene," he says, "we were compelled by the weather to take shelter in a farm house, and a thunderstorm coming on obliged us to remain all night. The house itself was not inferior to a common Scottish cottage, but it was rendered odious by the landlady, who was, all the time we stayed, 'drunk as a sow, Huncamunca.' Next day we proceeded," he continues, "to the military station and dockyard of Penetanguishene by a path through the woods, which, to the honour of the late Mr. Wilberforce, bears his name. Along it are settled several negro families. As I walked part of the way," Galt says, "I went into a cottage, pleasantly situated on a rising ground, and found it inhabited by a crow-like flock of negro children. The mother was busy with them, and the father, a good-natured looking fellow, told me that they were very comfortable, but had not yet made any great progress in clearing the land, as his children were still too young to assist. We reached Penetanguishene," Galt then says, "the remotest and most inland dockyard that owns obedience to the 'meteor-flag of England,' where, by the orders of the Admiralty, his Majesty's gun-boat the *Bee* was placed at my disposal. By the by," he adds, "the letter from the Admiralty was a curious specimen of the geographical knowledge which then prevailed there, inasmuch as it mentioned that the vessel was to go with me on Lake Huron in Lower Canada. In the village of Penetanguishene," he then informs us, "there is no tavern. We were therefore obliged to billet ourselves on the officer stationed there, of whose hospitality and endeavour to make the time pass pleasantly till he had the *Bee* ready for the lake, I shall ever retain a pleasant remembrance." He then describes his voyage in the little gun-boat as far as Detroit, and his examination of the river subsequently called the Maitland, and the site where Goderich was afterwards built.

Since 1840, the Rev. Geo. Hallen has been a resident clergyman at Penetanguishene. From him have been obtained the following particulars of detachments of military stationed from time to time at that post. In 1838 a detachment of the 34th regiment, Lieut. Hutton commanding. In 1838 also, there were some incorporated Militia there under Col. Davis. In

1840, a detachment of the 93rd Highlanders, under Lieut. Hay. In 1844, a detachment of the 84th regiment, under Lieut. West. In 1846, a detachment of the Royal Canadian Rifles, under Lieut. Black. In 1850, a detachment of the Royal Canadian Rifles, under Lieut. Fitzgerald. In 1851, a detachment of the Royal Canadian Rifles, under Lieut. Moffatt. In 1851, some of the Enrolled Pensioners, under Capt. Hodgetts.

In regard to the Navy. In 1843, June 8th, the *Minos*, a large gun-boat, in charge of Mr. Hatch and three men, arrived to be laid up. In the same year, the steamer *Experiment*, Lieut. Boxer, was stationed there. In 1847, the same steamer, but commanded by Lieut. Harper. In 1847 also, the steamer *Mohawk*, commanded by Lieut. Tyssen. In 1850, the same steamer, but commanded by Lieut. Herbert. The place was also visited by Capt. Ross, R.N., when on his way to the North Seas; and by Lord Morpeth, Lord Prudhoe, and Sir Henry Harte, (the two latter Captains in the Navy), on their way to or from the Manitoulin islands.

From Poulett Scrope's Life of Lord Sydenham, we learn that Penetanguishene was visited by that Governor of Canada in 1840. "From Toronto across Lake Simcoe to Penetanguishene on Lake Huron again, and back to Toronto, which I left again last night for the Bay of Quinté." —*Private Letter*, p. 190.

The following account of the removal of the British post from Drummond's island to Penetanguishene in 1828, has been also derived from the Rev. Mr. Hallen, who gathered the particulars from the lips of Mr. John Smith, aged 80, still living (1872) near Penetanguishene, formerly employed in the Ordinance Department at Quebec, and then as Commissariat Issuer at Drummond's island. "Mr. John Smith and his wife remained on the island till the 14th of November, 1828, when it was given up to the Americans. Lieut. Carson commanding a detachment of the 68th regiment was there at the time; and Mr. Smith well remembers Lieut. Carson giving up the keys to the American officers, and that 'they shook hands quite friendly.' The Government sent the brig *Wellington* to take away the British from the island, but it was too small, and they were obliged in addition to hire an American vessel. Mr. Keating was at that time Fort adjutant at the island, and Mr. Rawson, barrack master. Smith arrived at Penetanguishene as a Commissariat Issuer on the 20th or 21st November, 1828 He does not remember any vessels at Drummond island. He says that Commodore Barrie came up in the *Bullfrog*; and that the gossip of the island was, that he was the cause of its being given up to the Americans. Mr. Keating, the Fort adjutant, was afterwards Fort adjutant at Penetanguishene, where he arrived in the spring of 1829, having been detained at Amherstburgh. He died in the year 1849. Mr. Smith said that, as far as he could recollect, the detachments stationed on the island were, of the 71st Regiment, under Lieut. Impett; of the 79th, under Lieut. Matthews; of the 24th, under Lieut. James; of the 15th, under Lieut. Ingall. (The last-named officer lived afterwards at Penetanguishene) In 1828, there were at Penetanguishene 20 or 30 Marines, under the command of Lieut. Woodin, R.N. In regard to the four gun-boats which are sunk in the harbour, Mr. Smith said they were sunk there before 1828. He remembers the name of only one of them, the *Tecumseh*." Mr. Hallen remarks: "The account I heard of these gun-boats when I came to Penetanguishene was that they were brought here, I think, from Nottawasaga bay after the American war and were sunk to prevent their rotting. Vessels must have been built at Penetanguishene," Mr. H. adds, "as I remember a place on the Lake Shore, about five miles N.W. of Penetanguishene, being pointed out to me as the 'Navy Yard.' Many of the logs were still there."

The *Bee*, which conveyed Mr. Galt when on his voyage of explorations along the western coast of Lake Huron, was sold by public auction in 1832. In that year the first great reduction of the naval and military establishment at Penetanguishene took place. Step by step the process went on until the ancient dépôt was finally extinguished, and in 1859 the stone barracks were converted into a Public Reformatory. The enumeration of the stores disposed of by public vendue, on Thursday the 15th of March, 1830, and six following days, at Penetanguishene, will not be without pathos. At all events, those who have, at any time, made boats and the appurtenances of boats one of their hobbies, will not dislike to read the homely names of the articles then brought to the hammer. It will be observed that no mention is made of a certain memorable anchor laboriously dragged from York as far as the Landing *en route* to Penetanguishene; but taken no further, becoming, when half embedded in the earth there, an object of perpetual wonderment to beholders: a thing too ponderous to be conveniently handled and removed by an ordinary purchaser, let the amount paid for it be ever so trifling.

The following, then, were the miscellaneous articles belonging to the Crown advertised to be sold to the highest bidder on the 15th and following days of March, 1832, at Penetanguishene, and so, we may conclude, disposed of accordingly:—The *Tecumseh*, schooner, 175 tons. The *Newash*, brigantine, 175 tons. The *Bee*, gunboat, 41 tons. The *Mosquito*, gunboat, 31 tons. The *Wasp*, gunboat, 41 tons. Batteaux, three in number. Thirty-two feet cutter. Two thirty-two feet gigs and their furniture. One whale boat. One jolly boat. One nineteen feet gig. Twenty-two pounds old bunting. Canvas, mildewed slightly, 366 yards. Canvas, of all sorts, cut from frigate sails, 2170 yards. Old canvas, 491 yards. Packing cases, 23. Iron casks, 12. Iron bound casks, 8. Wood bound casks, 24. Chests, common, 2. Chests, top, 2. Cordage, worn, 988 fathoms. Cordage, in rounding, 318 fathoms. Cordage, in junk, 28 cwt. 20 lbs. Cordage, in paper stuff, 1 cwt. 3 qrs. 1 lb. Covers, hammock, 5. Iron, old wrought, 12 cwt. 3 qrs. 16½ lbs. Rigging, brigantine, standing, complete, 1 set. Running, in part, 1 set. Rigging, schooner, standing and running, complete, 1 set. Rigging, Durham boats, standing and running, in part, 2 sets. Rigging, boats, standing, worn, 1 set. Sails for a 32 gun ship, 1 set brigantine sails, 1 set schooner sails, 1 set Durham boat sails, 18 in number boat sails, 18 in number unserviceable stores. Axes, felling, 8. Bellows, camp forge, 2 pairs. Blocks, single, 11 inch, 1. Blocks, double, 10 inch, 1. Brushes, tar, 15. Buckets, leather, 14. Chisels, of sorts, 12. Compass glasses, 1. Cordage, 562 fathoms. Glass, broken, 16 panes. Hammocks, 16. Locks, stock, 1. Mallet, caulking, 1. Oars, fir, 7. Paint, white, 1 qr. 2 lbs. Paint, yellow, 2 qrs. 18 lbs. Planes, 10 in number. Punts, boats, 1. Saws, cross-cut, 5. Saws, hand, 6. Saws, dove-tail, 1. Saws, rip, 3. Spout, for pump, 1. Sweeps, 4. Shovels, 9. Twine, fine, 8½ lbs. Twine, ordinary, 17½ lbs. Seines, 1. The document which supplies us with the foregoing list announces that, "the stores will be put up in convenient lots, and that a deposit of 25 per cent. will be required at the time of sale, and the remainder of the purchase money previous to the removal of the articles, for which a reasonable time will be allowed." The whole is signed—Wm. Henry Woodin, Lieutenant commanding, June 18th, 1832.

We here bring to a close our Collections and Recollections in regard to Yonge Street. That our narrative might be the more complete, we have given a notice of the ancient terminus of that great thoroughfare, on Lake Huron. It will be seen that in Penetanguishene and its environs, Toronto has a place and a neighbourhood at the north abounding with interesting memories almost as richly as Niagara itself and that vicinity, at its south: memories intimately associated with its own history, not alone before the present century began, but also before even the preceding century began, taking into view, that is, the local history of this part of Canada prior to the acquisition of the country by the English.

From remote Penetanguishene, dismantled and abolished in a naval and military sense, our thoughts naturally turn to more conspicuous places that have in our day successively undergone the same process: to Kingston, to Niagara, to Montreal, to our own Fort, here at Toronto, and, finally, in 1871, to Quebec. The 8th of November, 1871, will be a date noted in future histories. On that day, the Ehrenbreitstein of the St Lawrence, symbol for a hundred years and more of British power on the northern half of the North American continent, was voluntarily evacuated, in accordance with a deliberate public policy. The 60th Regiment, it is singular to add, which on the 8th of November, 1871, marched forth from the gates of the citadel of Quebec, was a regiment that was present on the heights of Abraham in 1759, and helped to capture the fortress which it now peacefully surrendered. Is the day approaching when artistic tourists will be seen sketching, at Point Levi, the bold Rock in front of them for the sake of the ruins at its summit, not picturesque probably, but for ever famed in story?

[The Collections and Recollections in regard to TORONTO OF OLD terminate here. Revised and corrected, they are on the point of being reproduced in book form, with portraits on steel of the founder of the city, Governor Simcoe, and the first Chief Justice of Upper Canada, the Hon. W. Osgoode. The section on the early Marine of the Harbour will be given in the forthcoming volume. By an oversight, it will seem as if there were one or two gaps in the numbering of the Sections of this series in the *Journal*. There are, however, no gaps. No sections have been omitted.]

THE

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INDEX OF VOLUME XIII.

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MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—DECEMBER, 1872.

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 PM	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'.	M'N		
1	—	—	—	—	° —	° —	° —	° —	°	—	—	—	—	—	—	—	—	W	S	S	S 24 W	9.2	15.6	9.0	9.40	11.08	...	1.5
2	29.203	29.094	29.262	29.1877	31.9	36.6	30.4	33.00	+ 2.95	.166	.204	.139	.169	92	94	82	89	S	S W	W	S 59 W	5.0	6.2	10.5	6.95	8.06	0.260	1.6
3	.355	.489	.623	.5148	31.6	32.6	30.1	31.26	+ 1.05	.155	.168	.150	.154	88	85	89	88	W	W	W	S 78 W	23.8	14.0	14.2	15.49	15.08	...	0.2
4	.780	.820	.810	.8033	27.2	28.6	24.3	26.68	— 2.42	.132	.116	.097	.112	89	74	74	77	W	W	W	S 88 W	7.8	12.0	3.6	8.76	8.82	...	Inap.
5	.638	.604	.706	.6532	31.9	32.9	30.4	31.80	+ 3.17	.165	.132	.123	.136	92	69	72	76	S W	W	S W	S 71 W	12.2	17.2	13.0	10.19	10.92	...	...
6	.734	.890	.939	.8703	29.3	20.0	25.4	27.03	— 1.12	.144	.111	.118	.118	89	70	86	80	N	W	Calm.	N 67 W	13.4	11.0	0.0	7.17	8.24	..	0.3
7	.833	.690	.378	.5967	25.0	31.1	33.7	29.78	+ 2.07	.116	.102	.179	.136	86	58	95	81	W	S W	S W	S 47 W	2.8	11.0	18.0	8.70	9.11	.010	0.1
8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S W	W	N W	S 77 W	9.0	10.0	27.4	9.99	12.79	.120	0.1
9	.379	.487	.665	.5305	8.8	10.6	8.4	9.02	—17.85	.056	.053	.061	.056	87	75	96	87	N W	N W	N W	N 34 W	18.9	22.0	14.2	16.35	16.47	...	0.1
10	.732	.779	.901	.8323	6.2	19.2	18.0	13.92	—12.53	.052	.069	.060	.064	95	66	71	78	Calm.	W	N W	N 68 W	0.0	13.0	4.2	7.53	7.76	...	...
11	.957	.971	30.010	.9872	14.9	22.8	12.0	16.30	—10.75	.075	.081	.054	.065	87	66	73	74	W	N W	Calm.	N 56 W	1.0	13.8	0.0	4.87	5.18	...	...
12	.962	.829	29.751	.8422	7.3	22.8	23.6	17.78	— 7.87	.055	.094	.111	.087	93	78	88	86	N	Calm.	S W	S 79 W	3.4	0.0	6.8	1.71	2.80	...	...
13	.661	.447	.464	.5235	23.9	26.4	20.0	26.43	+ 1.17	.109	.113	.126	.118	84	70	78	82	S W	W	W	S 65 W	9.4	10.2	14.4	11.08	11.21	...	0.2
14	.631	.674	.864	.5448	29.3	32.6	35.1	32.45	+ 7.57	.144	.100	.143	.130	89	57	99	70	S W	S W	S W	S 53 W	7.6	2.4	18.8	7.44	8.72	...	Inap.
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	W	W	N 81 W	23.6	15.6	7.5	13.11	14.33	...	Inap.
16	.689	.545	.604	.6165	14.6	24.6	17.1	18.52	— 5.72	.076	.094	.068	.079	89	70	72	78	Calm.	S W	W	S 82 W	0.0	2.8	3.6	1.95	2.03	...	...
17	.758	.826	.873	.8323	12.4	21.8	10.7	16.95	— 6.95	.062	.072	.072	.069	80	63	78	76	N W	W	Calm.	N 88 W	1.2	4.5	0.0	3.49	3.73	...	...
18	.729	.506	.791	.6758	19.6	23.6	16.3	19.95	— 3.65	.085	.113	.070	.089	80	88	77	82	N E	N	W	N 22 W	3.0	8.4	2.8	3.88	4.72	...	0.4
19	.963	.999	.711	.8624	16.0	19.2	25.0	19.67	— 3.07	.074	.076	.123	.092	83	72	91	84	W	Calm.	E	S 73 W	10.3	0.0	12.0	2.48	7.21	...	2.0
20	.132	.309	.621	.3720	30.4	29.3	20.0	26.46	+ 3.38	.160	.123	.080	.120	95	75	75	80	E	W	W	S 62 W	7.6	21.0	2.4	2.96	12.82	...	5.5
21	.759	.653	.630	.6893	10.2	15.6	7.7	9.67	—13.18	.052	.073	.051	.055	76	83	84	80	W	W	W	S 79 W	8.9	5.4	31.9	10.25	10.43	...	0.2
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	S W	S 69 W	12.0	8.2	21.0	11.36	12.34	...	0.2
23	.374	.531	.854	.6098	10.6	8.1	-1.0	5.42	—17.00	.064	.047	.030	.047	92	70	85	83	W	W	W	S 83 W	8.6	31.6	20.4	18.21	18.54	...	1.2
24	30.033	30.141	30.173	30.1267	-4.2	-1.0	-7.7	-4.65	—26.87	.031	.035	.030	.030	82	84	92	84	N	Calm.	N	N 46 W	2.8	0.0	5.6	5.28	7.08	...	...
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	N E	N E	N 46 E	5.5	15.0	18.6	11.93	12.21	...	15.0
26	29.655	29.576	29.606	29.6100	-0.2	1.6	1.6	0.73	—21.13	.043	.044	.044	.043	97	94	94	94	N E	N	N W	N 29 E	16.8	12.0	9.0	13.86	15.11	...	8.0
27	.554	.474	.551	.5282	-6.2	9.9	8.0	3.83	—17.90	.028	.054	.053	.046	81	81	88	87	N W	N	N E	N 42 W	0.5	12.8	4.6	4.38	5 34	...	0.1
28	.641	.603	.787	.7110	10.9	20.0	15.6	15.63	— 5.98	.066	.080	.070	.075	94	80	76	84	N W	S W	W	S 74 W	3.8	15.2	8.0	7.29	7.79	...	0.2
29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	Calm.	S 85 W	8.6	2.0	0.0	4.21	4.28	...	0.2
30	30.074	30.009	.814	.9480	7.3	20.3	18.5	15.56	— 5.90	.055	.091	.091	.078	93	82	91	87	N W	Calm.	N E	N 1 W	4.4	0.0	2.5	0.86	1.58	...	0.5
31	29.668	29.755	.920	.7938	21.0	28.2	25.4	24.68	+ 3.25	.108	.136	.111	.116	95	87	81	87	N	N W	N W	N 10 W	5.2	4.0	8.5	2.70	3.31	...	0.4
	29.6758	29.6716	29.7123	29.6905	15.94	21.86	18.94	18.67	— 6.10	.091	.095	.091	.091	88	76	82	82	.....	.....	.....	.....	7.07	10.21	10.28	.....	9.06	0.390	38.0

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR DECEMBER, 1872.

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.....30.173 at 10 p.m. on 24th } Monthly range
Lowest Barometer.....29.088 at 4 p.m on 2nd } 1.085.

Self-registering Ther.
- Maximum Temperature ..... 40°0 on 8th } Monthly range
- Minimum Temperature .....—13°8 on 27th } 53°8.
- Mean Maximum Temperature .....24°53 } Mean daily range
- Mean Minimum Temperature .....10°08 } 14°45.
- Greatest daily range.....34°5 from p m. of 8th to a.m. of 9th.
- Least daily range ..... 0°8 from a.m. to p.m. of 14th.

Warmest Day..... 2nd ... Mean Temperature.....33°00 }
Coldest Day.....24th ... Mean Temperature.....—4°05 } Difference=37°05.

Maximum Solar Radiation: 107°0 on 18th } Monthly range
Maximum Terrestrial Radiation: —20°0 on 25th } 127°0.

Aurora observed on 2 nights, viz., 3rd and 23rd.

Possible to see Aurora on 12 nights; impossible on 19 nights.

Raining on 3 days; depth 0.390 inches; duration of fall 17.5 hours.

Snowing on 24 days; depth 38.0 inches; duration of fall 139.3 hours.

Mean of Cloudiness=0.76.

WIND.

Resultant Direction N. 87° W.; Resultant Velocity 5.51 miles.

Mean Velocity 9.06 miles per hour.

Maximum Velocity 32.6 miles, from 9.30 to 10.30 p.m. of 21st.

Most Windy day 23rd; Mean Velocity 18.54 miles per hour.

Least Windy day 30th; Mean Velocity 1.68 miles per hour.

Most Windy hour noon; Mean Velocity 11.33 miles per hour.

Least Windy hour 8 a.m.; Mean Velocity 0.80 miles per hour.

Lunar halo on 14th.

Large meteor in S at 4.50 p.m. of 11th.

It will be seen from the Comparative Table that the fall of snow during December, 1872, is the greatest in any similar month.

COMPARATIVE TABLE FOR DECEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above average	Maximum	Minimum.	Range.	RAIN. No. of days.	Inches	SNOW. No. of days.	Inches	WIND. Resultant. Direction.	Velo'y	Mean Velocity.
	°	°	°	°	°					°		
1844	28.2	+ 2.3	48.5	1.6	46.9	6	Imp.	6	4.2		...	0.40 lbs
1845	21.1	— 4.8	39.7	— 2.4	42.1	2	Imp	12	4.7	...	...	0.70
1846	27.5	+ 1.6	49.2	3.9	45.3	6	1.210	9	6.0	...	...	0.57
1847	30.1	+ 4.2	49.6	0.3	49.3	7	1.185	8	6.8	...	...	0.55
1848	29.1	+ 3.2	48.8	1.1	47.7	7	2.750	7	16.5	S 83 W	1.12	5.44mls
1849	26.6	+ 0.6	40.8	6.6	47.3	5	0.840	12	9.0	N 82 W	2.56	6.23
1850	21.7	— 4.2	48.8	— 9.0	57.8	2	0.190	18	29.5	N 44 W	2.93	7.40
1851	21.5	— 4.4	44.0	—14.5	58.5	6	1.075	15	10.7	N 82 W	4.00	7.37
1852	31.9	+ 6.0	51.0	13.2	37.8	7	3.995	10	20.1	S 69 W	1.03	6.54
1853	25.3	— 0.6	46.4	— 8.4	54.8	4	0.625	13	22.3	N 35 W	2.39	4.98
1854	21.9	— 4.0	44.3	— 7.0	51.3	5	0.590	12	17.2	N 44 W	4.30	8.56
1855	26.8	+ 0.9	47.0	— 5.2	52.2	6	1.845	10	29.5	S 88 W	5.29	11.28
1856	22.9	— 3.0	42.2	— 9.1	51.3	6	1.790	20	10.3	S 87 W	4.62	11.56
1857	31.9	+ 6.0	46.0	4.7	41.3	7	3.205	14	9.0	N 89 W	2.50	6.84
1858	27.4	+ 1.5	45.4	4.2	41.2	11	1.055	18	10.4	N 78 W	1.66	9.36
1859	17.9	— 8.0	54.8	— 6.0	60.8	3	1.035	23	37.4	N 53 W	4.29	10.77
1860	24.0	— 1.9	39.0	— 7.0	46.0	3	1.362	21	13.5	N 62 W	4.66	10.14
1861	31.1	+ 5.2	55.2	5.6	49.7	6	0.560	8	6.8	N 72 W	3.50	7.96
1862	28.8	+ 2.9	50.1	— 3.4	53.5	5	1.940	8	10.4	N 73 W	3.17	7.58
1863	27.0	+ 1.1	53.4	— 1.5	54.9	10	2.960	17	7.1	N 41 W	1.61	9.40
1864	24.7	— 1.2	50.4	—10.4	60.8	9	2.045	18	27.1	S 82 W	4.94	9.98
1865	27.7	+ 1.8	54.2	5.7	48.5	7	1.727	11	5.2	S 81 W	3.07	7.33
1866	25.1	— 0.8	51.0	— 5.0	56.0	7	2.790	13	15.5	S 88 W	4.98	9.91
1867	21.6	— 4.3	49.5	—12.8	62.3	7	1.405	21	13.0	S 81 W	4.82	10.32
1868	22.5	— 3.4	44.2	— 3.2	47.4	1	0.005	18	15.5	N 71 W	4.05	9.80
1869	28.7	+ 2.8	45.0	6.0	39.0	10	2.590	9	7.1	S 80 W	2.31	8.44
1870	26.5	+ 0.6	45.2	— 5.8	51.0	8	2.430	16	15.9	N 89 W	5.06	11.46
1871	19.9	— 6.0	48.2	—21.0	69.2	4	0.940	20	14.2	S 70 W	6.91	11.52
1872	18.7	— 7.2	40.0	—13.8	52.8	3	0.390	24	38.0	N 87 W	5.51	9.06
Results to 1871.	25.84	...	47.59	—3.29	50.88	5.72	1.654	13.59	14.14	N 61 W	1.91	8.76
Excess for '72.	— 7.17	...	— 7.59	— 10.51	+ 2.92	— 2.72	— 1.264	+ 10.41	+ 23.86	...	...	+ 0.30

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1872.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY

Latitude 43° 39' 4" North. Longitude 5h. 17m. 33s. West. Elevation above

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.
Mean temperature	22.39	20.69	19.92	40.48	51.90	63.74	70.16
Difference from average (22 years)	— 0.70	— 2.33	— 9.76	— 0.65	+ 0.27	+ 2.13	+ 2.87
Thermic anomaly (lat 43° 40')	—10.41	—14.01	—20.18	— 9.72	— 6.20	— 0.86	+ 1.46
Highest Temperature	41.8	45.2	46.4	70.0	78.8	88.0	96.0
Lowest Temperature	— 2 5	— 3.6	— 10.8	22.7	32.0	41.8	52.2
Monthly and annual ranges	44.3	48.8	57.2	47.3	46.8	46.2	43.8
Mean maximum temperature	27.72	29.29	29.80	49.97	61.97	73.38	80.67
Mean minimum temperature	13.92	12.51	12.41	31.35	41.38	51.91	59.61
Mean daily range	13.80	16.78	17.39	18.62	20.59	21.47	21.06
Greatest daily range	33.4	34.5	36.0	37.8	36.8	30.0	29.0
Mean height of the barometer	29.5941	29.6204	29.6621	29.5758	29.5670	29.5586	29.5551
Difference from average (31 years)	—.0514	—.0047	+.0610	—.0142	—.0030	—.0155	—.0334
Highest barometer	30.193	30.231	29.965	29.970	29.976	29.871	29.774
Lowest barometer	28.986	28.997	28.789	29.091	28.941	29.154	29.317
Monthly and annual ranges	1.207	1.234	1.176	0.879	1.035	0.717	0.457
Mean humidity of the air	80	79	75	67	72	73	60
Mean elasticity of aqueous vapour	0.103	0.094	0.088	0.169	0.280	0.436	0.507
Mean of cloudiness	0.82	0.52	0.54	0.54	0.54	0.51	0.50
Difference from average	+ 0.09	—0.20	— 0.08	— 0.06	— 0.02	— 0.02	0.00
Resultant direction of the wind	S. 87° W.	N. 61° W.	N. 66° W.	N. 61° W.	N. 52° W.	N. 69° W.	N. 67° W.
" velocity of the wind	4.73	3.32	5.36	3.84	2.25	0.76	1.19
Mean velocity (miles per hour)	8.87	8.93	10.48	9.12	6.49	3.80	3.56
Difference from average (24 years)	+ 0.53	+0.30	+ 1.68	+ 0.49	— 0.25	— 1.41	— 1.43
Total amount of rain	0.220	0.350	0.700	0.910	1.934	3.148	2.297
Difference from average	—1.008	—0.544	—0.918	—1.529	—1.320	+0 170	—0.951
Number of days rain	5	5	2	9	14	8	13
Total amount of snow	3.9	7.3	16.3	0.7	...	...	...
Difference from average (29 years)	—13.59	—12.01	+ 4.08	— 1.69	— 0.07	...	...
Number of days snow	15	9	14	5	...	...	...
Number of fair days	13	16	17	18	17	22	18
Number of auroras observed	2	2	4	8	6	8	8
Possible to see aurora (No. of nights)	11	18	17	20	25	24	25
Number of thunder storms	...	...	...	...	3	3	5

REGISTER FOR THE YEAR 1872.

TORONTO, ONTARIO.

Lake Ontario 108 feet. Approximate elevation above the sea, 342 feet.

Aug.	Sept.	Oct.	Nov.	Dec.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
°	°	°	°	°	°	°	°	°	°	°	°
69.48	59.11	45.55	32.91	18.67	42.92	43.81	45.93	43.13	43.33	43.84	43.51
+ 3.40	+ 1.07	— 0.31	— 3 62	— 7.17	— 1.23	— 0.34	+ 1.78	— 1.02	— 0.82	— 0.31	— 0.64
+ 0.98	— 2.39	— 8 25	—10.29	—17.33	— 8.08	— 7.19	— 5.07	— 7.87	— 7.07	— 7.16	— 7.49
91.8	84.4	70.0	40.9	96.0	96.0	89.5	88.4	89.0	93.4	95.2	94.0
51.0	38.2	25.2	8.2	— 13.8	— 13.8	— 21.0	— 6.6	— 5.4	— 15.6	— 12.8	— 14.0
40.8	46.2	44.8	43.8	53 8	19.8	110.5	95.0	94.4	109.0	108.0	108·0
78.57	68.68	54.11	40.56	24.53	...	...	...	...	...	...	...
61.29	50.51	37.13	26.11	10.08	...	...	..	...	...	...	...
17.35	18.17	16.98	14.45	14.45	17.59	16.46	15.71	14.61	15.26	15.47	14.99
26.4	27.5	25.6	23.6	34.5	37.8	34.6	36.2	33.6	38.7	31.6	40.8
29.6142	29.5937	29.6940	29.5689	29.6905	29.6079	29.6066	29.5956	29.5970	29.6421	29.6140	29.6216
—.0073	—.0766	+.0495	—.0424	+.0413	—.0085	—.0098	—.0208	—.0194	+.0257	—.0024	+.0052
29.653	29.942	30.194	29.966	30.173	30.231	30.388	30.212	30.223	30.445	30.332	30.940
29.311	29.914	29.226	29.047	29.008	28.789	28.673	28.166	28.793	28.824	28.768	28.807
0.542	0.728	0.968	0.919	1.085	1.442	1.715	2.046	1.430	1.621	1.564	2.133
74	78	77	76	82	75	73	76	77	76	74	75
0.539	0.406	0.240	0.152	0.191	0.259	0.242	0.279	0.252	0.264	0.252	0.248
0.56	0.58	0.51	0.68	0.75	0.59	0.64	0.62	0.66	0.64	0.61	0.61
+ 0.08	+ 0.08	— 0.10	— 0.06	0.00	— 0.02	+ 0.03	+ 0.01	+ 0.05	+ 0.03	0.00	0.00
°	°	°	°	°	°	°	°	°	°	°	°
N. 51 w.	N. 79 w	N. 18 w	S. 85 w.	N. 87 w	N 72 w.	N. 72 w.	N. 45 w.	N. 64 w	N. 57 w.	N. 60 w.	N. 73 w.
1.43	1.47	2.22	5.15	5.51	2.91	2.49	1.61	2.55	1.47	2.05	2.83
3.73	5.24	4.59	7.48	9.06	6.78	8.24	7.33	7.20	7.69	7.00	7.41
— 1.55	— 0.20	— 1.61	— 0.23	+ 0.30	— 0.24	+ 1.22	+ 0.31	+ 0.18	+ 0.67	— 0.02	+ 0.39
2.405	2.526	3.288	0.420	0.390	18.588	22.771	33.898	31.182	29.408	19.041	34.209
—0.616	—1.190	+0.899	—2.557	—1.264	-10.828	—6.645	+4.482	+1.766	—0.008	-10.375	+4.793
19	16	14	7	3	115	110	116	115	103	100	126
...	...	inapp.	1.3	38.0	67.5	99.6	122.9	84.6	78.7	110.5	52.1
...	...	— 0.87	— 1.98	+23.86	—2.27	+29.83	+53.13	+14.83	+ 8.93	+40.73	—17.67
...	...	1	9	24	77	84	77	81	82	84	69
12	14	17	14	7	185	187	185	180	190	181	180
8	4	9	6	2	67	55	77	47	50	43	44
26	18	21	19	12	236	209	206	182	193	202	209
6	9	2	...	...	28	22	34	32	25	23	24

TEMPERATURE.

	1872.	Average of 32 years.	Extremes.	
	°	°	°	°
Mean temperature of the year	42.92	44.15	46.36 in '46	42.16 in '56
Warmest month	July.	July.	July, 1868.	Aug. 1860.
Mean temperature of the warmest month	70.16	67.29	75.80	64.46
Coldest month	Decem.	February.	Jan., 1857.	Feb. 19, 1848
Mean temperature of the coldest month	18.67	23.02	12.75	26.60
Difference between the temperatures of the warmest and the coldest months	51.49	44.27	...	...
Mean of deviations of monthly means from their respective averages of 32 years, signs of deviation being disregarded	2.69	2.40	3.51 in 1843.	1.32 in 1864.
Month of greatest deviation without regard to sign	March.	January.	Jan., 1857.	...
Corresponding magnitude of deviation	9.76	3.71	10.3	...
Warmest day	July 1.	...	July 14, '68.	July 31, '41
Mean temperature of the warmest day	80.80	77.68	84.50	72.75
Coldest day	Dec. 24.	...	Feb. 6, 1855. Jan 22, 1857	Dec. 22, '42
Mean temperature of the coldest day	—4.65	—1.24	—14.38	9.57
Date of the highest temperature	July 1.	...	Aug. 24, 1854	Aug. 19, '40
Highest temperature	96.0	90.7	99.2	82.4
Date of the lowest temperature	Dec. 27	...	Jan. 10, '59	Jan. 2, 1842.
Lowest temperature	—13.8	—12.3	—26.5	1.9
Range of the year	109.8	103.0	118.2	87.0

BAROMETER.

	1872.	Average of 31 years.	Extremes.	
Mean pressure of the year	29.6079	29.6164	29.6770 in 1849.	29.5602 in 1864.
Month of highest mean pressure	October.	September	Jan., 1849.	June 1864.
Highest mean monthly pressure	29.6040	29.6703	29.8046	29.6525
Month of lowest mean pressure	July.	May.	March, 1859	Nov., 1849.
Lowest mean monthly pressure	29.5551	29.5700	29.4143	29.5886
Date of the highest pressure of the year	Feb. 7.	...	Jan. 8, 1866.	Jan. 14, 1870
Highest pressure	30.231	30.378	30.940	30.212
Date of the lowest pressure of the year	March 31.	...	Jan 2. 1870.	March 17. '45
Lowest pressure	28.789	28.680	28.166	28.939
Range of the year	1.442	1.698	2.133 in 1866.	1.303 in 1845.

RELATIVE HUMIDITY.

	1872.	Average of 30 years.	Extremes.	
Mean humidity of the year	75	77	82 in 1851.	73 in 1858.
Month of greatest humidity	December.	January.	Jan. 1857.	Dec.. 1858.
Greatest mean monthly humidity	83	83	89	81
Month of greatest humidity	July.	May.	Feb. 1843.	April. 1849.
Least mean monthly humidity	60	71	58	76

EXTENT OF SKY CLOUDED.

	1872.	Average of 19 years.	Extremes.	
Mean cloudiness of the year	0.59	61	0.66 in 1869	0.57 in 1856.
Most cloudy month	December.	December.	...	...
Greatest monthly mean of cloudiness	0.75	0.85	0.83	0.73
Least cloudy month	July.	August.	...	...
Lowest monthly mean of cloudiness	0.50	0.48	0.29	0.50

WIND.

	1872.	Result of 24 years.	Extremes.	
Resultant Direction	N. 72° W.	N. 61° W.	...	...
Resultant velocity in miles	2.91	1.91	...	...
Mean velocity without regard to direction	6.78	7.02	8.55 in 1860.	5.10 in 1853.
Month of greatest mean velocity	March.	March.	March, 1860.	Jan., 1848.
Greatest monthly mean velocity	10.48	8.80	12.41	5.82
Month of least mean velocity	July.	July.	Aug. 1852.	Sept, 1860.
Least monthly mean velocity	3.56	4.99	3.30	5.79
Day of greatest mean velocity	March 6.	...	Nov. 15, 1871	Dec. 2, 1848.
Greatest daily mean velocity	23.25	23.50	32.16	15.30
Day of least mean velocity	Oct. 20.	...	...	...
Least daily mean velocity	0.15	...	...	...
Hour of greatest absolute velocity	Nov. 20 n. to 1 p.m	...	Dec. 27, 1861. 9 to 10 a.m.	Mar. 14, 1853 11 a.m. to n.
Greatest velocity	37.0	40.0	46.0	25.6

RAIN.

	1872.	Average of 29 years.	Extremes.	
Total depth of rain in inches	18.588	29.416	43.555 in '72	18.588 in '72.
Number of days in which rain fell	115	109	130 in 1861.	80 in 1841.
Month in which the greatest depth of rain fell.	October.	Septemb'r.	Sept., 1843.	Sept., 1848.
Greatest depth of rain in one month	3.288	3.716	9.760	3.115
Month in which the days of rain were most frequent	August	October.	October, 1864 June, 1869.	May, 1841.
Greatest number of rainy days in one month	19	18	22	11
Day in which the greatest amount of rain fell.	June 10.	...	Sep. 14, 1843	Sept. 14, '48.
Greatest amount of rain in one day	1.551	2.071	3.455	1.000

SNOW.

	1872.	Average of 29 years	Extremes.	
Total depth of snow in inches	67.5	69.8	122.9 in 1870	28.4 in 1851.
Number of days in which snow fell	77	63	87 in 1859.	33 in 1849.
Month in which the greatest depth of snow fell.	December.	February.	March, 1870	Dec. 1851.
Greatest depth of snow in one month	38.0	19.31	62.4	10.7
Month in which the days of snow were most frequent	December.	January.	Dec., 1872.	Feb., 1849.
Greatest number of days of snow in one month.	24	14	24	8
Day in which the greatest amount of snow fell.	Dec., 25-	...	Feb. 5, 1863. March 27, '70	Jan. 10, '57.
Greatest fall of snow in one day	15.0	9.4	16.0	5.5

DIFFERENCE OF CERTAIN METEOROLOGICAL ELEMENTS FROM THEIR NORMAL VALUES FOR EACH QUARTER AND FOR THE YEAR, FROM DECEMBER, 1871, TO NOVEMBER, 1872, INCLUSIVE.

	Barometer.	Temperature	Rain.	Days Rain.	Snow.	Days Snow.	Velocity of Wind.	Clouded Sky.
		°	in.		in.			
Winter	— .0415	—3.06	— 2.290	—0.36	—25.54	—4.04	+1.25	— .02
Spring	+ .0139	—3.38	— 3.767	—3.09	+ 2.39	+5.37	+0.81	— .05
Summer	— .0207	+2.80	— 1.397	+6.62	...	...	—1.46	+ .02
Autumn	— .0232	—0.95	— 2.848	+3.41	— 2.85	+1.31	—0.68	— .02
Year	— .0177	—1.15	—10.202	+6.58	—26.00	+2.64	—0.02	— .02

PERIODICAL OR OCCASIONAL EVENTS—1872.

February 28. Crows seen.
March 30. Robins seen.
April 2. Song Sparrows.
" 5. Blue Birds arrived in neighbourhood.
" 6. Swallows seen.
" 9. Wild geese passing. First lightning. First vessel entered harbour as far as Brock Street.
" 10. Pigeons numerous. No signs of vegetation except the Chestnut buds are swelling.
" 23. Last snow of the season.
" 25. Frogs heard.—26th, Butterflies.
" 30. First thunder storm.
May 4. Last ice of season.
" 6. Maple trees in flower.
" 12. Baltimore Birds.
" 13. Last frost of season.
" 19. Humming Birds.
June 20. Fireflies seen —28th, very numerous.
" 30. Vegetation suffering very much for the want of rain.
July 30. Plover numerous.
August 26. Swallows gone.
September 3. First frost of season.
" 19. Very heavy thunder passed over this neighbourhood—large quantities of hail fell—much damage caused.
" 27. First ice of season.
October 15. First snow of season.
November 17. Very large number of shooting stars observed.
" 30. First snow storm.
December 10. Bay Frozen. Crossed on 11th.
" 19. Sleighing good.
" 25. Heavy Snow Storm from N. E.—wind in furious gusts—23 inches of snow up to night of 26th. Storm very general.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JANUARY, 1873.

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 the Wind.				Rain in inches	Snow in inches
	0 A.M.	2 P.M.	10 P.M.	Mean.	A.M.	2 P.M.	10 P.M	MEAN		0 A.M.	2 P.M.	10 P.M.	M'N	0 A.M.	2 P.M	10 P.M.	M'	0 A.M.	2 P.M.	10 P.M.		0 AM.	2 P.M.	10 P M	Res't-tant.	MEAN		
					°	°	°	°	°																		
1	29.919	29.951	29.903	29.9128	21.4	29.0	22.1	22.80	+ 0.01	.097	.109	.102	.109	84	81	86	83	W	S W	N E	N 71 W	0.7	2.2	1.0	1.58	1.93	...	...
2	.827	.650	.303	.5093	25.4	27.6	33.7	29.58	+ 8.00	.118	.143	.184	.157	80	95	95	93	E.	E		N 84 E	8.6	14.8	13.4	10.79	10.87	0.470	...
3	.084	.183	.223	.1813	30.4	36.2	32.2	34 98	+13.73	.230	.167	.162	.174	95	78	89	86	S W	S E		S 54 W	18.8	13.0	24.0	17.61	14.92	.220	Inap.
4	.531	.760	.867	.7468	22.5	25.4	23.0	23.82	+ 2.58	.104	.097	.095	.098	86	72	73	77	S W	W	Calm.	S 69 W	10.0	12.8	0.0	11.93	12.17	...	Inap.
5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E	E	N W	N 57 E	19.2	10.0	22.2	8.33	14.22	...	7.4
6	.596	.859	.920	.8145	20.7	20.7	16.0	18.85	— 2.63	.085	.079	.068	.077	77	70	76	76	N W	W	W	N 65 W	15.0	5.0	5.0	11.68	11.93	...	...
7	.898	.772	.688	.7727	22.1	26.8	26.6	25.13	+ 3.92	.102	.109	.110	.109	80	74	84	80	S W	S	S E	S 16 W	9.0	10.0	5.8	8.26	9.08	...	...
8	.458	.238	.413	.3027	29.7	34.7	14.0	25.92	+ 4.70	.125	.171	.060	.113	70	65	80	77	E	S W	S W	S 32 W	5.8	18.3	7.4	0.74	10.27	...	0.2
9	.380	.445	.548	.4645	9.1	6.6	1.2	4.98	—16.24	.050	.039	.037	.041	77	67	82	75	W	W	W	S 72 W	15.0	21.2	13.6	15.97	16.00	...	...
10	.623	.670	.760	.6018	—1.3	3.4	—1.7	—0.30	—21.57	.040	.042	.041	.039	94	84	94	90	W	W	W	S 70 W	16.4	14.0	17.0	14.90	15.46	...	...
11	.794	.833	.905	.8493	—0.6	13.1	6.6	6.37	—14.95	.041	.065	.053	.053	97	83	90	90	W	W	W	S 80 W	14.0	24.5	8.8	13.91	14.07	...	...
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	E	E	E 75 E	1.8	9.5	7.0	4.44	6.01	...	...
13	.624	.396	.419	.4792	30.4	36.6	36.9	34.63	—13.47	.160	.196	.208	.188	95	90	95	92	E	S W	W	S 32 W	0.5	3.0	5.8	1.69	2.93	.020	...
14	.721	.941	30.032	.9213	29.0	24.6	24.3	24.63	+ 3.18	.125	.092	.092	.099	78	70	76	74	N W	N	S E	N 15 W	15.4	3.6	16.6	5.27	9.97	...	...
15	.949	.731	29.919	.7412	20.0	29.0	38.4	30.48	+ 8.76	.080	.147	.197	.152	80	92	85	88	E	E	S W	East.	19.0	13.8	7.2	12.34	12.97	...	Inap.
16	.416	.188	.173	.2630	40.2	42.3	32.2	35.38	+14.00	.237	.250	.162	.198	95	95	80	92	S W	N	N W	N 38 W	3.6	8.2	25.6	5.58	10.41	.400	Inap.
17	.599	.763	.825	.7362	16.4	9.1	8.6	10.27	—11.05	.076	.058	.054	.061	83	80	87	86	N W	N	N	N 26 W	19.6	14.0	14.8	15.90	16.04	...	...
18	.722	.602	.606	.6037	2.3	1.6	0.8	1.33	—20.35	.041	.042	.041	.042	86	92	94	92	N;	N	W	N 0 E	13.0	10.0	6.0	8.74	9.51	...	2.0
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S W	S W	S 60 W	1.4	10.4	21.8	11.71	12.07	...	0.3
20	.417	.307	.321	.3153	20.0	24.3	28.6	24.60	+ 2.78	.100	.116	.144	.122	93	90	92	92	S W	S W	S W	S 31 W	15.0	8.4	3.2	10.32	10.37	...	3.0
21	.207	.042	.101	.1500	28.6	31.1	27.9	29.60	+ 7.72	.144	.107	.138	.151	92	90	90	92	E	E	N	N 57 E	5.0	8.0	9.0	5.17	6.85	...	4.0
22	.503	.046	.806	.6603	24.3	26.6	14.6	21.55	— 0.33	.110	.100	.071	.090	90	73	84	82	W	N W	N W	N 38 W	10.8	12.0	6.6	9.39	10.46	...	0.2
23	.882	.770	.649	.7648	5.9	5.5	13.1	8.40	—13.02	.050	.049	.077	.058	88	88	98	91	N E	N E	E	N 50 E	11.1	13.4	17.8	13.98	14.92	...	4.2
24	.392	.203	.431	.3723	12.4	12.4	11.8	11.93	—10.04	.070	.070	.071	.060	92	92	96	93	E	N E	N W	N 55 E	17.0	11.0	1.0	10.45	11.71	...	15.3
25	.606	.703	.793	.7146	—1.0	13.1	3.7	4.32	—17.80	.036	.059	.042	.043	84	75	82	80	W	W.	N W	N 60 W	4.4	7.3	1.8	5.76	6.59	...	...
26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	S	N E	N 27 E	2.0	1.8	1.2	0.41	1.99	...	0.1
27	.427	.486	.557	.5205	14.2	23.0	10.4	18.56	— 3.73	.070	.098	.082	.086	93	79	90	80	N	N W	N W	N 20 W	0.5	5.0	5.8	3.55	4.22	...	0.2
28	.568	.672	.959	.7432	18.2	10.9	—9.2	6.62	—17.00	.038	.055	.023	.053	89	77	87	85	W	N W	N W	N 57 W	4.0	14.0	9.0	11.27	11.73	...	0.2
29	30.023	.916	.795	.9042	—10.4	1.9	—4.2	—5.75	—28.13	.020	.040	.034	.032	100	86	96	94	N W	S W	W	S 78 W	2.0	12.0	2.6	4.31	4.91	...	...
30	29.606	.529	.574	.5823	1.2	14.9	13.2	11.93	—10.45	.045	.067	.084	.066	94	79	80	86	S W	S W	W	S 54 W	8.2	20.0	6.0	9.35	9.83	...	...
31	.772	.710	.773	.7703	17.8	23.6	15.3	18.62	— 3.07	.086	.092	.071	.082	89	71	80	80	S W	W	N	S 78 W	5.6	4.5	13.7	5.22	6.96	...	0.1
	29.6197	29.5964	29.6274	29.6179	16.74	20.35	16.76	17.70	— 3.98	.094	.101	.093	.093	88	82	87	86					9.72	11.01	9.72	...	10.01	1.110	39.2

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JANUARY, 1873.

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.....30.062 at Midn't on 14th } Monthly range=
Lowest Barometer.....29.042 at 2 p.m. on 21st } 1.020.

Self-registering Ther.
- Maximum temperature.....46°0 on 16th. } Monthly range=
- Minimum temperature.....—18°4 on 29th. } 64°4
- Mean maximum temperature.....25°23 } Mean daily range=
- Mean minimum temperature.....8°85 } 16°38.
- Greatest daily range.....37°0 from a.m. of 28th to p.m. of 29th.
- Least daily range.....5°4 from a.m. to p.m. of 24th.

Warmest day.....19th; mean temperature.....3.°58 } Difference=41°33.
Coldest day.....29th; mean temperature.....—37°75 }

Maximum Radiation { Solar.....107°0 on 22nd } Monthy range= 134°0.
{ Terrestrial.....—27°0 on 29th }

Aurora observed on 4 nights, viz:—3rd, 7th, 25th, 28th.
Possible to see Aurora on 12 nights; impossible on 10 nights.
Raining on 4 days; depth, 1.110 inches; duration of fall, 28.5 hours.
Snowing on 17 days; depth 39.2 inches; duration of fall 120.6 hours.
Mean of Cloudiness, 0.73.

WIND.

Resultant direction, N. 78° W.; resultant velocity, 2.96 miles.
Mean velocity, 10.01 miles per hour.
Maximum velocity, 31.0 miles, from Mid. to 1 a.m. of 6th.
Most windy day, 17th; mean velocity, 16.94 miles per hour.
Least windy day, 26th; mean velocity, 1.09 miles per hour.
Most windy hour, 1 p.m.; mean velocity, 11.90 miles per hour.
Least windy hour, 2 a.m.; mean velocity, 8.40 miles per hour.

Fog on the 13th and 16th.
Lightning on evening of 30th.
Solar halo on 30th; Lunar haloes, on 7th, 9th and 14th.

COMPARATIVE TABLE FOR JANUARY.

YEAR.	TEMPERATURE. Mean	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of Days.	RAIN. Inches.	SNOW. No. of days.	SNOW. Inches.	WIND. Resultant. Direction.	WIND. Resultant. Velocity.	WIND. Mean Velocity.
	°	°	°	°	°					°		
1845	28.5	+ 3.4	45.7	— 0.2	45.9	5	Imp.	9	22.7	...	...	0.70 lbs.
1846	26.7	+ 4.6	44.0	— 1.3	45.3	5	2.355	10	6.0	...	...	0.65
1847	23.3	+ 0.2	42.4	2.7	39.7	7	2.136	5	7.5	...	...	1.09
1848	28.7	+ 5.6	51.1	—11.4	62.5	7	2.246	8	7.1	N 82 w	2.03	5.82 mls.
1849	18.5	— 4.6	39.5	—14.2	53.7	4	1.176	10	9.2	N 63 w	3.06	6.71
1850	20.7	+ 0.6	46.4	0.9	30.5	5	1.250	8	5.2	N 37 w	0.69	5.80
1851	26.5	+ 2.4	43.4	—12.8	56.2	4	1.276	10	7.8	S 77 w	3.20	7.69
1852	18.1	— 4.7	37.3	—10.6	47.9	0	0.000	19	30.9	N 68 w	3.14	7.67
1853	23.0	— 0.1	40.0	— 9.7	50.6	1	0.290	9	7.5	N 27 w	2.52	6.34
1854	23.0	+ 0.5	46.4	— 5.4	51.8	7	1.270	11	7.5	N 77 w	2.44	6.91
1855	25.9	+ 2.8	49.0	— 5.4	54.4	5	0.525	13	23.3	N 73 w	1.91	7.26
1856	10.0	— 7.1	34.4	—12.0	46.4	0	0.000	14	13.6	N 75 w	5.24	10.69
1857	12.8	—10.3	37.2	—20.1	57.3	3	Insp	16	21.8	N 70 w	4.96	10.31
1858	30.0	+ 6.9	47.4	6.5	40.9	6	1.152	11	4.0	N 71 w	2.33	7.40
1859	20.4	+ 3.3	43.2	—20.5	60.7	6	1.449	19	16.4	S 81 w	3.17	8.76
1860	23.4	+ 0.3	46.4	— 0.8	53.2	6	0.740	16	8.7	N 89 w	0.09	0.37
1861	19.9	— 3.2	37.0	—11.2	48.2	4	0.685	23	20.6	N 86 w	2.92	9.30
1862	21.7	— 1.4	44.6	— 2.6	47.1	5	0.118	19	27.4	N 26 w	2.00	8.83
1863	28.1	+ 5.0	47.0	—14.0	61.0	10	1.122	17	20.6	N 61 w	1.13	7.23
1864	22.8	— 0.3	44.2	— 9.0	53.2	5	1.165	14	26.3	S 78 w	0.00	10.22
1865	17.7	— 5.4	37.2	— 9.0	46.2	1	0.440	18	14.8	N 85 w	4.80	9.39
1866	20.7	— 2.4	44.0	—14.0	58.0	4	0.522	19	10.3	N 75 w	2.08	9.34
1867	17.6	— 5.5	43.8	— 4.8	48.6	1	Inap.	21	42.0	N 55 w	3.27	6.96
1868	10.0	— 4.1	30.0	— 7.0	46.0	2	Inap.	21	14.0	S 83 w	3.97	8.91
1869	27.7	+ 4.6	45.0	— 1.0	46.0	4	0.887	12	9.8	N 72 w	3.40	9.21
1870	24.4	+ 1.3	45.0	— 3.2	48.2	8	3.412	18	21.5	S 80 w	2.63	8.08
1871	21.3	— 1.8	40.4	—13.2	53.6	8	0.864	23	43.0	S 49 w	2.56	9.84
1872	22.4	— 0.7	41.8	— 2.6	44.3	5	0.220	16	3.9	S 87 w	4.73	8.87
1873	17.7	— 5.4	46.0	—18.4	64.4	4	1.110	17	39.2	N 78 w	2.96	10.00
Results to 1872.	23.07	...	43.20	—7.46	50.66	4.62	1.196	14.00	16.46	N 80 w	3.18	8.81
Excess for 1873	— 5.37	...	+ 2.80	— 10.94	+ 13.74	— 0.61	— 0.086	+ 3.00	+ 22.76	...	...	+ 1.69

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—FEBRUARY, 1878.

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 aver'ge.	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.	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.	Res'l-tant.	MEAN		
1	29.795	29.813	29.916	29.8398	°5.6	°8.4	°5.6	°3.28	—19.27	.062	.061	.028	.049	96	96	85	90	N W	N	W	N 33 W	7.8	11.5	5.2	9.00	10.19	...	0.2
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S W	S W	—	—	—	—	—	—	—	—
3	.531	.377	.257	.3668	16.0	24.3	28.0	23.75	+ 1.08	.081	.104	.144	.117	90	70	92	89	N W	W	E	S 69 W	3.5	5.0	5.0	4.95	6.22	...	0.1
4	.026	.065	.495	.2113	35.5	40.5	29.0	34.58	+11.87	.206	.170	.126	.167	99	68	78	83	S W	W	N W	N 88 W	9.8	16.0	20.0	9.20	11.93	...	0.1
5	.720	.711	.658	.7097	23.8	30.8	29.0	27.78	+ 5.00	.113	.118	.133	.120	93	68	83	70	W	W	W	S 80 W	11.8	9.0	5.4	7.41	8.42	...	...
6	.629	.532	.603	.5980	20.6	33.4	27.5	30.73	+ 7.90	.126	.165	.121	.133	88	66	81	77	W	S W	N	S 60 W	3.2	9.9	3.4	5.07	5.71	...	...
7	.515	.289	.133	.3000	21.8	34.4	30.2	31.08	+ 8.18	.106	.161	.176	.148	91	74	83	84	N E	E	S W	S 83 E	4.0	4.5	2.8	1.54	2.67	...	...
8	.183	.200	.423	.2847	34 4	32.9	14.9	26.87	+ 3.60	.174	.153	.062	.126	87	82	73	81	S W	W	N W	N 84 W	9.6	19.6	24.0	15.41	16.67	...	0.1
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	N W	W	N 40 W	11.5	16.0	3.8	13.76	14.05	...	...
10	30.093	.821	.485	.7473	—2.8	16.0	20.0	11.30	—11.77	.034	.074	.093	.066	90	83	87	87	N	S E	S E	S 63 E	2.6	12.0	8.8	4.71	6.50	...	0.4
11	29.209	.293	.469	.3416	32.9	32.9	21.4	28.47	+ 5.30	.103	.125	.083	.120	90	65	72	70	S W	N W	N	N 68 W	16.4	17.6	8.6	9.28	12.29	...	0.1
12	.587	.612	.655	.6270	44.6	10.6	11.7	14.67	— 8.65	.071	.079	.040	.061	85	74	55	72	N	E	N E	N 35 W	13.4	12.8	12.6	8.18	9.62	...	Inap.
13	.782	.810	.827	.8113	1.9	10.9	14.9	9.53	—13.78	.040	.055	.069	.054	86	77	80	79	N	N E	E	N 37 E	9.2	11.8	11.4	9.01	9.50	...	...
14	.891	.936	30.049	.9577	9.9	15.6	10.9	12.02	—11.38	.060	.079	.061	.066	89	90	86	88	N E	N W	N W	N 17 E	10.5	5.2	4.8	5.20	6.47	...	0.4
15	30.114	30.035	29.832	.9503	5.2	23.2	23.0	17.32	— 6.18	.042	.090	.114	.084	75	77	90	80	N W	S E,	E	N 46 E	2.8	1.2	9.1	1.98	3.67	...	...
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	N E	N E	N 57 E	8.4	16.4	6.6	9.80	10.17	...	...
17	29.683	29.808	.852	.7883	24.0	33.1	22.8	26.82	+ 3.12	.121	.115	.100	.112	91	91	82	77	N	E	E	N 16 E	15.2	3.6	1.5	5.66	6.39	...	...
18	.733	.540	.426	.5507	28.6	32.9	33.7	31.03	+ 8.13	.147	.139	.107	.152	92	74	86	83	E	E	Calm.	N 85 E	13.5	8.3	0.0	5.48	5.66	...	...
19	.338	.690	.726	.5913	30.6	33.7	30.1	32.62	+ 8.72	.196	.145	.150	.164	90	76	80	83	W	W	N W	S 88 W	23.2	19.0	13.6	13.59	14.42	...	...
20	.860	.760	.385	.6478	14.0	26.7	25.4	20.37	— 3.08	.075	.078	.111	.086	89	70	77	N	E	E	N 63 E	2.0	8.0	19.7	3.48	8.53	...	Inap.
21	28.907	.002	.232	.0533	28.6	24.3	12.4	21.22	— 3.00	.144	.097	.062	.099	92	74	80	81	E	W	W	S 78 W	14.2	28.5	15.0	6.82	19.31	...	2.0
22	29.321	.353	.384	.3578	0.6	14.2	8.0	9.90	—14.42	.053	.035	.048	.057	90	78	78	83	W	W	W	N 89 W	7.2	18.2	19.0	12.01	12.25	...	...
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	W	N 87 W	10.0	19.0	13.0	14.87	15.00	...	...
24	.337	.332	.412	.3668	—0.2	14.9	18.2	11.72	—12.90	.034	.069	.075	.061	86	80	76	80	S W	W	W	S 82 W	12.6	23.0	16.6	18.55	18.73	...	...
25	.405	.566	.679	.5995	21.0	26.8	22.1	23.55	— 1.25	.096	.109	.102	.104	83	75	86	82	N W	W	W	N 76 W	14.4	21.0	6.5	13.31	13.56	...	...
26	.741	.728	.446	.6135	15.2	26.8	25.7	23.42	— 1.58	.072	.100	.107	.093	82	75	77	77	N W	E	E	N 84 E	1.4	7.0	23.0	0.13	9.80	...	...
27	.118	.265	.487	.3018	20.8	29.7	14.9	23.46	— 1.72	.140	.110	.063	.104	96	67	73	70	E	W	N W	S 5 E	15.0	16.0	7.6	1.78	13.17	...	7.0
28	.659	.777	.861	.7828	0.6	27.9	23.0	20.20	— 5.20	.058	.124	.095	.091	90	81	74	80	N W	W	N W	N 70 W	8.2	6.8	4.0	4.58	4.90	...	...
—	29.5510	29.5682	29.5710	29.5899	18.19	25.54	20.82	21.51	— 2.13	.101	.107	.097	.102	89	75	80	81	.....	.....	.....	.....	10.4	12.77	9.03	.....	10.21	...	10.4

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR FEBRUARY, 1873.

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 A.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....30.123 at 8 a.m. on 15th. } Monthly range
Lowest Barometer.....28.848 at 8 a.m. on 21st. } 1.275.

Self-registering Ther.
- Maximum Temperature.....43°0 on 4th. } Monthly range
- Minimum Temperature.....—10°6 on 2nd. } 53.6.
- Mean Maximum Temperature.....27°09. } Mean daily range
- Mean Minimum Temperature.....10°02. } 17°07.
- Greatest daily range.....36°4 from 8 a.m. of 10th to 8 a.m. of 11th.
- Least daily range.....0°3 from a.m to p.m. of 14th.

Warmest day.....4th....Mean Temperature.....34.58 } Difference=31°30.
Coldest day.....1st....Mean Temperature.....3.28 }

Maximum } Solar.....126°5 on 21st. } Monthly range
Radiation } Terrestrial.....—21°4 on 2nd. } 147.9.

Aurora observed on 3 nights, viz.: 1st, 21st and 23rd.

Possible to see Aurora on 10 nights; impossible on 12 nights.

Snowing on 11 days; depth 10.4 inches; duration of fall 42.5 hours.

Mean of Cloudiness, 0.59.

WIND.

Resultant Direction N. 68° W.; Resultant Velocity 4.20 miles.

Mean Velocity 10.21 miles per hour.

Maximum Velocity 31.5 miles, from 1 to 2 p.m. of 21st.

Most Windy day 21st; Mean Velocity 19.31 miles per hour.

Least Windy day 7th; Mean Velocity 2.57 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 13.13 miles per hour.

Least Windy hour 3 a.m.; Mean Velocity 8.60 miles per hour.

Solar haloes on 10th, 15th, 16th, 17th and 23rd

Lunar haloes on 13th and 15th.

Large Meteor in S. W. at 10 p.m. of 2nd.

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.	Vel'y	Mean Velocity.
	°		°	°	°					°		
1845	26.0	+ 3.0	49.1	— 4.2	53.3	5	Imp.	9	10.0	...	...	0.99 lbs
1846	20.4	— 2.6	41.9	—10.7	52.6	0	0.000	13	46.1	...	...	0.65
1847	21.5	— 1.5	40.9	0.0	40.9	2	0.650	13	27.5	...	...	0.69
1848	26.6	+ 3.6	40.6	0.0	46.6	4	0.775	8	10.5	N 65 W	2.53	5.69 mls
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	3.48	7.01
1851	27.6	+ 4.6	50.2	2.0	48.2	7	2.600	4	2.4	N 64 W	1.09	6.94
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	12.4	N 49 W	2.61	7.30
1854	21.1	— 1.9	42.8	—10.8	53.6	5	1.460	15	18.0	N 7 E	1.73	6.91
1855	15.4	— 7.6	39.0	—25.4	64.4	2	1.770	14	21.8	N 40 W	4.38	8.17
1856	15.7	— 7.3	37.8	—18.7	56.5	0	0.000	8	0.7	N 81 W	7.70	10.71
1857	28.5	+ 5.5	52.4	— 6.0	58.3	11	3.050	11	11.7	S 78 W	3.68	9.82
1858	17.0	— 6.0	42.4	— 7.3	49.7	1	Inapp.	16	20.7	N 72 W	3.22	9.12
1859	26.0	— 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	— 8.6	58.7	7	1.330	13	18.8	N 61 W	3.28	8.73
1861	26.1	+ 3.1	46.0	—20.8	66.8	4	0.815	17	29.7	N 77 W	3.86	10.58
1862	22.5	— 0.5	37.8	— 5.2	43.0	3	0.180	17	23.1	N 65 W	3.93	8.52
1863	22.4	— 0.6	41.6	—19.8	61.4	7	1.450	12	22.9	N 23 W	2.27	10.13
1864	24.3	+ 1.3	45.0	—15.0	60.0	2	0.395	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	3.95	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	28.0	+ 5.0	44.0	0.2	43.8	8	1.325	13	13.4	N 67 W	1.58	8.85
1868	17.2	— 5.8	45.0	—11.5	56.5	1	0.040	16	32.5	N 69 W	3.23	10.64
1869	25.0	+ 2.0	46.0	— 1.0	47.0	2	0.105	19	39.7	N 34 W	4.18	10.04
1870	21.0	— 1.5	40.6	— 0.6	47.2	2	0.520	18	20.1	N 29 W	2.84	8.10
1871	24.3	+ 1.3	48.0	—15.8	63.8	3	0.040	15	23.0	N 70 W	4.26	9.87
1872	20.7	— 2.3	45.2	— 3.0	48.8	5	0.350	9	7.3	N 61 W	3.32	8.93
1873	21.6	— 1.5	43.0	—10.5	53.5	0	0.000	11	10.4	N 68 W	4.20	10.21
Res'lts to 1872.	22.95	...	44.31	—8.06	52.37	4.03	0.877	12.46	18.91	N 66 W	3.15	8.64
Excess for '73.	1.44	...	1.31	2.44	1.13	4.03	0.877	1.46	8.51			+ 1.57

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MARCH, 1873.

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.				Relative Humidity				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 PM	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.	MEAN		
1	29.869	29.810	29.766	29.8167	10.9	34.0	20.0	28.53	—0.03	.061	.156	.147	.118	86	79	92	83	W	S W	Calm.	N 83 W	2.8	4.9	0.0	2.13	2.50	...	0.1
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	.583	.671	.774	.6898	12.4	3.4	4.4	5.47	—20.56	.066	.045	.050	.049	89	90	95	89	N	N W	N W	N 59 W	1.4	3.9	2.4	2.61	3.58	...	0.6
4	687.	30.032	30.128	30.0308	—0.2	7.3	1.9	3.25	—23.00	.036	.046	.040	.041	85	75	86	82	N W	N W	N W	N 30 W	16.8	16.0	9.0	13.86	14.69	...	2.1
5	30.220	30.205	30.102	30.2089	—5.7	21.4	12.0	10.02	—10.50	.030	.065	.061	.053	93	56	80	76	W	S W	W	S 74 W	4.6	11 0	4.8	6.35	6.10	...	...
6	30.156	30.024	29.899	30.0173	8.4	31.1	39.4	24.16	+ 2.62	.054	.146	.146	.119	87	83	86	85	W	S W	S W	S 41 W	2.0	12.8	9 1	6 80	6.84	...	...
7	29.827	29.656	.456	29.6208	29.7	42.3	39.4	37.92	+10.92	.147	.173	.193	.170	89	84	80	75	S W	S W	S W	S 38 W	3.4	15.2	0.6	6.88	7.37	...	...
8	.176	.127	.240	.1882	39.1	34.8	25.7	32.62	+ 5.22	.205	.146	.114	.153	86	72	82	80	S W	W	W	S 71 W	19.0	23.3	16.7	15.70	17.40	...	0.8
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	.547	.556	.386	.5048	20.7	32.2	31.1	28.47	+ 0.60	.092	.186	.153	.126	82	69	87	79	N W	N W	N	N 60 W	17.4	1.8	7.2	7.48	10.37	...	...
11	28.934	.155	.340	.1627	33.7	36 6	29.3	32.53	+ 4.49	.184	.127	.144	.154	95	59	80	84	S W	W	W	S 86 W	4.4	25 0	8.5	10.65	13.90	.450	0.2
12	29.448	.655	.714	.6860	24.3	30.8	27.9	27.72	— 0.76	.111	.142	.131	.127	85	82	86	84	W	N W	W	N 79 W	8.8	21.4	12.2	11.90	12.56	..	0.1
13	.780	.760	.704	.7813	21.0	35.6	31.0	29.87	+ 1.16	.098	.132	.136	.121	83	63	75	73	N W	W	W	N 85 W	11.5	12.8	10.0	9.31	10.73	...	...
14	.959	.950	.818	.9103	25.7	39.4	35.5	34.37	+ 5.28	.114	.109	.132	.121	82	45	63	64	N W	S W	E	S 68 W	0.4	3.0	7.0	1.42	4.35	...	...
15	.537	.300	28.916	.2323	35.5	37 3	43.0	38.65	+ 9.23	.202	.221	.256	.223	97	99	93	95	E	S	W	S 20 W	10.0	5.2	9.0	4.08	9.42	.480	...
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17	.952	.950	29.854	.9073	25.7	37.6	31.5	31.87	+ 1.78	.114	.114	.133	.121	82	49	75	68	W	N W	N W	N 73 W	15.5	33.4	27.8	30.57	31.38	...	0.2
18	.644	.304	.300	.3933	31.5	32.9	31.5	31.62	+ 1.18	.148	.160	.170	.154	83	86	89	86	W	S	S W	N 60 W	12.0	8.4	3.5	8.55	9.59	..	...
19	.424	.415	.374	.3993	27.5	40.9	36.2	35.05	+ 4.28	.135	.182	.193	.172	90	71	90	84	N W	S	E	S 66 W	4.5	4.4	7.6	2.02	5.39	.030	0.7
20	.217	.120	28.975	.0968	36.6	32.9	31.1	32.77	+ 1.66	.196	.178	.176	.175	90	94	100	94	E	E	N	N 76 E	6.8	11.8	7 3	8.85	10.65	.198	4.0
21	28.935	28.934	29.028	28.9747	28.1	31.1	28.6	28.48	— 2.99	.131	.169	.144	.144	93	91	92	92	W	S W	N W	N 85 W	13.0	11.3	9.2	12.85	13.30	...	3.5
22	29.261	29.446	.527	29.4256	26.8	35.1	29.6	30.18	— 1.68	.137	.121	.116	.121	94	69	74	73	N W	N W	W	N 58 W	20.2	9.0	5.1	13.21	14 36	..	...
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	.771	.742	.713	.7437	8.8	17.8	18.2	15.42	—17.11	.030	.066	.088	.072	78	68	89	81	S W	W	N W	N 83 W	7.2	26.8	7.0	12 31	13 81	...	Inap.
25	.654	.597	.437	.5443	14.6	20.3	18.2	17.98	—14.95	.078	.090	.088	.086	93	82	89	88	N E	N E	N E	N 33 E	1.4	5.3	13.0	6.34	7.47	...	...
26	.152	.109	.437	.2437	20.3	21.8	13.5	17.09	—15.32	.102	.099	.066	.086	94	84	83	86	N E	N	N W	N 2 W	17.0	14.0	15.2	14.7	14.76	...	2.0
27	.720	.811	.783	.7835	7.7	24.3	23.2	19.54	—14.16	.056	.090	.101	.086	93	69	82	81	N W	S W	S W	N 67 W	18.0	19.4	32.0	17.95	20.40	...	9.7
28	.703	.506	.343	.5062	10.9	34.4	35.8	29.57	— 4.48	.061	.136	.173	.132	80	69	82	78	N	E	E	S 78 E	5.4	9.2	8.0	8.84	12.32	...	...
29	.038	28.822	28.924	28.9232	38.0	38.0	35.1	38.37	+ 1.92	.220	.220	.173	.198	96	96	84	91	E	N W	N W	N 20 W	5.6	7 0	38.2	10 08	13 57	.490	Inap.
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31	.038	29.296	29.570	29.3223	32.6	37.6	29.7	34.20	— 0.98	.179	.166	.147	.166	97	73	89	85	Calm.	N W	W	N 59 W	0.0	12.5	1.0	3.76	7 73	...	1.2
	29.5864	29.5338	29.5203	29.5331	21.69	30.42	27.03	26.60	— 3.37	.110	.131	.134	.127	89	74	85	82					10.35	13.13	11.87	...	11.47	1.756	25.2

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MARCH, 1873.

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 of the wind are from hourly observations.

Highest Barometer.....30.246 at 8 a.m. on 5th.
Lowest Barometer.....28.797 at 4 p.m. on 29th. } Monthly range 1.449.

Self registering Ther.
- Maximum temperature.....45°0 on 15th.
- Minimum temperature.....—6.0 on 5th } Monthly range 51°0
- Mean maximum temperature.....34°03
- Mean Minimum temperature.....11°38 } Mean daily range 15°81
- Greatest daily range.....32°3 from p.m. of 2nd to p.m. of 3rd.
- Least daily range..... 4°5 from noon to midnight of 18th.

Warmest day.....15th; mean temperature 38°05
Coldest day..... 4th; mean temperature 3°25 } Difference=35°40

Maximum { Solar .....137°0 on 22nd.
Radiation { Terrestrial ..... -16°0 on 5th. } Monthly range=153°0

Aurora observed on 4 nights, viz: 21st, 22nd, 23rd and 27th.

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

Snowing on 15 days; depth, 25.2 inches; duration of fall, 108.0 hours.

Raining on 5 days; depth, 1.758 inches; duration of fall, 37.7 hours.

Mean of cloudiness, 0.67.

WIND.

Resultant direction, N. by W.; Resultant velocity, 5.01 miles.
Mean velocity, 11.47 miles per hour.

Maximum velocity, 47.5 miles, from 10.30 to 11.30 p.m. of 15th.

Most windy day, 16th; mean velocity, 31.38 miles per hour.

Least windy day, 1st; mean velocity, 2.50 miles per hour.

Most windy hour, noon; mean velocity 13.34 miles per hour.

Least windy hour, 8 p.m.; mean velocity, 9.68 miles per hour.

Solar haloes on 1st, 2nd, 6th, 17th and 27th. Lunar haloes on 10th and 18th.

Blue birds, 17th; Robins, 23rd.

It will be noticed from the comparative table that this is the most windy March except 1860, and that both the greatest velocity in one day (31.4 miles per hour), and the largest absolute velocity in one hour (47.5) occurred in this month. The month has also been marked by an excess of rain and snow, low temperature as regards the average and the extremes. The barometric pressure has also been much below the average, and marked by rapid and large fluctuations.

COMPARATIVE TABLE FOR MARCH.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	RAIN. Inches.	SNOW. No. of days.	SNOW. Inches	WIND. Resultant. Direction.	Resultant. Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1845	35.4	+ 6.0	62.7	6.6	56.1	5	.8	8	2.8	...	...	0.66 lbs.
1846	33.1	+ 3.7	49.6	8.3	41.3	9	1.965	5	2.3	...	...	0.30
1847	26.2	— 3.2	43.9	5.6	38.3	5	0.850	6	4.2	...	...	0.71
1848	28.6	— 0.8	53.6	0.0	58.6	5	1.220	6	0.7	N 66 W	2.03	5.80mls.
1849	33 5	+ 4.1	53.0	15.1	37.9	7	1.525	2	2.3	N 3 W	1 48	5.37
1850	29.8	+ 0.4	46.5	7.2	39.3	2	0.745	7	11.2	N 52 W	2.62	7.62
1851	32.4	+ 3.0	59.3	12.0	47.3	3	0.770	9	8.8	N 21 W	1.93	7.65
1852	27.7	— 1.7	44.8	— 7.4	52.2	8	3.080	12	19.5	N 8 W	0.71	5.81
1853	30.6	+ 1.2	56.3	0.0	56.3	6	1.080	8	7.1	N 58 W	2.60	5.96
1854	30.7	+ 1.3	55.1	7.4	47.7	9	2.425	3	2.8	N 63 W	3.30	8.03
1855	28.5	— 0.9	49.4	— 2.9	52.3	5	1.485	11	18.1	N 88 W	4.76	9.95
1856	23.1	— 6.3	41.4	—14.0	55.4	0	0.000	12	16.2	N 71 W	7.68	11.39
1857	27.8	— 1.6	57.6	— 5.5	63.1	4	0.335	15	11.3	N 63 W	6.63	10.84
1858	28.4	— 1.0	55.4	— 5.5	60.9	10	0.917	6	0.2	N 58 W	5.45	8.56
1859	36.3	+ 6.9	54.2	9.8	44.4	15	4.054	8	1.0	N 64 W	1.96	10.39
1860	34.5	+ 5.1	67.0	12.8	54.2	5	0.882	11	2.4	N 64 W	7.61	12.41
1861	26.9	— 2.5	47.4	— 5.2	52.6	8	2.125	14	7.1	N 54 W	4.33	10.56
1862	28.8	— 0.6	43.2	8.0	35.2	8	2.560	11	18.5	N 12 W	2 50	9.38
1863	25.8	— 3.6	42.2	— 4.4	46.2	4	0.667	17	11.4	N 27 W	2.62	9.27
1864	29.1	— 0.3	50.2	3.0	47.2	9	1.620	12	3.7	N 53 W	2.29	8 41
1865	33.0	+ 4.2	55.6	— 3.5	59.1	10	3.050	12	18.9	N 61 W	2.18	8.80
1866	27.6	— 2.8	45.8	7.5	38.3	8	1.915	18	7.2	N 73 W	6.84	11.51
1867	26.6	— 2.8	46.8	3.0	43.8	6	0.617	14	33.4	N 34 W	2.12	8.52
1868	31.3	+ 1.9	59.0	—16.6	74.6	7	2.660	5	4.2	N 21 W	2.12	8.58
1869	23.1	— 6.3	46.8	— 5.4	52.2	3	0.985	9	15.0	N 52 W	2.86	8.02
1870	26.3	— 3.1	44.0	5.2	38.8	2	0.765	18	62.4	N 18 E	4.73	10.13
1871	34.7	+ 5.3	58.5	17.0	41.5	8	2.782	12	13.0	N 31 W	2.59	8.31
1872	19.9	— 9.5	46.4	—10.8	57.2	2	0.700	14	16.3	N 66 W	5.36	10.48
1873	26.6	— 2.8	45.0	— 6.0	51.0	5	1.756	15	25.2	N 61 W	5.01	11.47
Res'lts to 1872	29.38	.....	51.45	1.74	46.71	6.09	1.588	10.12	12.36	N 61 W	3.22	8.87
Excess for 73.	2.78	.....	6.45	7.74	1.29	1.09	0.168	4.88	12.84	...	...	2.60

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—APRIL, 1873.

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°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 PM	MEAN	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'	MEAN	Rain in inches.	Snow in inches.
					°	°	°	°	°												°							
1	29.648	29.539	29.199	29.4373	26.8	36.2	35.8	33.97	— 1.63	.122	.159	.173	.159	85	74	82	81	W	E	E	N 77 E	0.6	13.4	22.6	8.67	9.54	0.170	...
2	.037	.192	.342	.2242	36.2	39.8	36.2	36.48	+ 0.50	.209	.189	.176	.186	98	76	81	86	S E	S W	S W	S 41 W	2.2	23.5	16.2	9.27	12.33	.050	...
3	.470	.532	.668	.5762	35.5	43.0	35.8	38.40	+ 2.03	.145	.164	.148	.149	69	59	70	64	W	W	N W	N 83 W	14.0	20.0	2.8	11.55	12.01	...	...
4	.780	.778	.744	.7730	33.3	38.0	35.8	35.83	— 0.90	.170	.144	.134	.149	89	63	63	71	Calm.	E	E	N 79 E	0.0	15.0	21.0	8.56	8.74	.100	...
5	.726	.688	.624	.6507	35.8	35.8	37.6	36.60	— 0.53	.173	.206	.217	.199	82	98	96	91	N E	E	E	N 70 E	22.2	21.0	10.0	15.89	16.29	.670	...
6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	S E	N	N 54 E	4.0	3.4	2.8	2.15	3.80	.330	...
7	.534	.447	.453	.4705	36.2	37.3	37.4	37.10	— 0.80	.209	.221	.219	.215	98	99	98	97	E	E	W	N 81 E	7.8	7.2	1.0	4.19	4.38	.120	...
8	.474	.479	.590	.5103	39.4	39.8	36.9	38.05	— 0.23	.240	.225	.209	.218	99	92	95	95	N	N E	N E	N 24 E	3.0	7.6	11.6	5.93	6.86	.690	...
9	.381	.342	.388	.3743	35.1	36.2	35.5	36.05	— 2.02	.190	.216	.209	.202	93	100	100	95	E	Calm.	W	N 77 E	19.2	0.0	0.8	7.41	9.07	.875	...
10	.495	.625	.707	.6198	36.6	42.7	35.1	38.93	— 0.12	.182	.188	.177	.181	75	68	86	76	S W	S W	Calm.	S 50 W	14.6	16.0	0.0	11.16	11.23	...	...
11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E	E	E	N 77 E	3.4	12.0	10.8	8.27	8.43	.020	...
12	.617	.568	.594	.5668	36.9	47.4	44.1	42.57	+ 2.77	.200	.208	.242	.208	91	63	84	77	Calm.	S	N	N 58 E	0.0	4.6	9.6	1.96	4.85	...	...
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	N	N W	N 24 W	12.2	20.0	18.2	15.38	16.60	...	...
14	.653	.561	.553	.5902	39.1	53.5	43.8	45.82	+ 5.25	.163	.147	.102	.168	68	38	66	66	N W	N W	N W	N 31 W	10.5	26.5	17.2	14.53	14.78	...	...
15	.564	.659	.725	.6630	39.4	45.2	39.1	42.08	+ 1.15	.142	.172	.180	.165	58	57	75	63	N	S E	E	N 72 E	9.1	13.0	11.0	6 61	10 82	...	...
16	.723	.682	.657	.6757	38.7	45.9	38.7	40.80	— 0.62	.177	.182	.222	.196	75	58	94	77	E	E	E	N 84 E	16.2	21.0	15.5	17.01	17.10	.440	...
17	.556	.464	.359	.4467	35.1	34.7	34.4	34.73	— 6.97	.193	.187	.191	.192	97	93	96	95	E	E	N E	N 76 E	11.2	17.7	8.6	13.33	13.52	.380	Insp.
18	.238	.190	.210	.2085	33.3	38.7	36.6	36.85	— 5.20	.180	.211	.204	.199	95	90	94	91	N E	S	S	N 59 E	3.6	5.0	2.9	1.02	3 05	.090	Insp.
19	.228	.298	.486	.3523	36.2	43.8	34.8	37.95	— 4.48	.201	.200	.139	.179	94	70	69	78	S W	N W	N W	N 44 W	3.5	21.0	11.8	10.08	11.19	.040	...
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S	N	N 65 W	11.5	7.8	5.0	3.40	5 66	...	...
21	.468	.476	.521	.4867	29.3	41.0	33.3	35.47	— 7.72	.109	.123	.142	.123	67	46	74	60	N	S	N W	N 32 W	1.0	14.2	12.2	1.52	7.82	...	...
22	.533	.608	.595	.5486	31.9	40.6	30.8	34.77	— 8.78	.143	.103	.112	.121	79	40	64	60	N	S	N W	N 6 W	10.2	7.2	15.8	4.85	10.42	...	...
23	.651	.586	.626	.6233	27.9	42.0	36.9	35.60	— 8.35	.110	.160	.175	.153	71	59	79	73	N	S W	N	N 14 W	6.1	8.0	12.5	5.95	8.08	...	...
24	.618	.561	.527	.5565	33.7	41.0	30.8	35.30	— 9.00	.175	.132	.149	.151	90	49	87	75	N W	S W	N	N 62 W	4.0	6.8	0.2	3.08	3.88	...	...
25	.422	.360	.378	.3837	30.4	39.7	32.6	34.27	—10.46	.146	.202	.149	.163	86	86	80	81	N W	S W	N W	S 70 W	2.8	2.2	4.2	2.73	4.05	...	Insp.
26	.400	.456	.554	.4785	32.6	45.2	34.4	37.82	— 7.20	.158	.191	.158	.169	85	63	79	74	W	N W	N W	N 82 W	8.8	22.3	10.0	10.65	11.30	...	...
27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S	S W	N 88 W	11.7	6.6	3.2	3.54	6.67	...	...
28	.718	.632	.570	.6353	37.6	48.8	40.2	42.98	— 2.78	.175	.135	.115	.139	77	39	46	51	Calm.	S E	S E	S 64 E	0.0	8.0	3.6	2.45	4.32	...	...
29	.584	.679	.658	.6163	39.4	52.1	44.5	46.53	+ 0.43	.163	.146	.135	.156	67	37	46	50	N E	E	W	N 83 E	3.4	9.5	6.5	3.95	5.83	...	...
30	.776	.778	.844	.8087	42.3	57.1	44.9	49.47	+ 2.98	.219	.262	.139	.205	81	56	47	58	N W	S W	N	N 40 W	13.0	8.0	6.6	7.54	9.86	...	...
	29.5299	29.5192	29.5429	29.5310	35.15	42.62	37.04	38.58	— 2.51	.171	.170	.172	.174	83	67	78	75					7.86	12.16	9.34		9.05	3.975	Insp.

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR APRIL, 1873.

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., 6 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.844 at 10 p.m. on 30th } Monthly range
Lowest Barometer.....29.087 at 6 p.m on 2nd } 0.757.

Self-register-ing Ther. { Maximum Temperature .....61°2 on 30th } Monthly range
Minimum Temperature .....24°4 on 23rd } 36°8.
Mean Maximum Temperature .....46°76 } Mean daily range
Mean Minimum Temperature .....32°07 } 14°69.
Greatest daily range.....25°7 from a m. to p.m of 14th.
Least daily range .....3°1 from a.m. to p.m. of 9th.

Warmest Day.....30th ... Mean Temperature.....49°47 } Difference=15°50.
Coldest Day ..... 1st ... Mean Temperature.....33°97 }

Maximum { Solar.....123°5 on 13th } Monthly range
Radiation { Terrestrial ..... 15°0 on 23rd } 108°5.

Aurora observed on 9 nights, viz, 2nd, 15th, 18th, 19th, 20th, 21st, 25th, 26th and 30th.

Possible to see Aurora on 18 nights; *impossible* on 12 nights.

Snowing on 3 days; depth inapp.; duration of fall 5.3 hours.

Raining on 13 days; depth 3.975 inches; duration of fall 124.7 hours.

Mean of Cloudiness, 0.68.

WIND.

Resultant Direction N. 18° E.; Resultant Velocity 2.89 miles.

Mean Velocity 9.05 miles per hour.

Maximum Velocity 26.6 miles, from 1 p.m. to 2 p.m. of 14th.

Most Windy day 16th; Mean Velocity 17.10 miles per hour.

Least Windy day 18th; Mean Velocity 3.05 miles per hour.

Most Windy hour 2 p.m.; Mean Velocity 12.15 miles per hour.

Least Windy hour 2 a.m.; Mean Velocity 6.79 miles per hour.

Fog on 6th, 7th and 9th.

Solar haloes on 1st and 28th. Lunar halo on 3rd.

5th—First Thunder storm of the year, extending over a large part of Canada, and causing a considerable destruction of life and property. 11th—Bay clear of ice. 17th—*City of Toronto's* first trip. 12th—Woodpeckers seen. 24th—Swallows seen, 18 days later than last year.

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.
	°		°	°	°					°		
1845	42.1	+ 1 0	66.7	15.5	51.2	11	3.290	4	5.5	..	...	1.00 lbs
1846	44.0	+ 2.9	81.8	24.2	57.6	10	1.300	2	1 3	...	...	5.55
1847	39.2	— 1.9	65.1	9.3	55.8	8	2.870	2	4.0	...	...	9
1848	41.3	+ 0.2	65.1	22.7	42.4	5	1.455	1	0.5	N 77 W	1.46	4.89mls
1849	39.	— 2.1	72.0	15.5	56.5	10	2.055	2	1.7	N 43 W	3.11	7 50
1850	37.9	— 3 2	65.7	18.8	47.7	7	1.720	2	1.1	N 50 E	1.12	..04
1851	41.3	+ 0.2	59.3	25.8	33.5	11	2.290	3	1 2	...	...	8 67
1852	38..	— 2.9	53.8	20.0	33.8	6	1.990	4	9.4	N 23 E	2.44	6.68
1853	41.9	+ 0 8	65.7	25.0	40.7	10	2.625	1	1.0	N 12 W	1.95	5.20
1854	41.0	— 0.1	64.5	20.2	44.3	12	2.685	4	3.7	N 50 E	2.57	6.81
1855	42.4	+ 1.3	69.4	10.7	58.7	8	2.030	3	1.6	N 30 W	3.91	7.57
1856	42.3	+ 1.2	72.2	14 2	58.0	13	2.780	3	0.1	N 20 E	1.64	6.05
1857	35.4	— 5.7	52.0	5.9	46.1	10	1.750	11	12.9	N 60 W	4.15	10 24
1858	41.5	+ 0.4	65.2	21.8	43.4	13	1.64.	2	0.1	N 14 W	1.64	9.57
1859	39.5	— 1.6	64.8	22.6	42.2	9	2.527	8	1.2	N ... W	2.03	10.79
1860	39.5	— 1 6	61.8	19.5	42.3	11	1 28.	5	0.3	N 37 W	4.10	10.59
1861	42.6	+ 0.9	67.0	23.8	43.2	12	1 61	4	6.9	N ..7 E	2.31	8.90
1862	39.6	— 1.5	68.0	14.5	53..	10	2.23.	4	0.2	N 50 E	2.18	9.77
18 3	42 0	+ 0.9	69.0	8.6	60.4	8	2.210	4	1 6	N 14 E	3 75	9 20
1864	40 9	— 0.2	59.4	28 1	31.3	16	3.635	3	3.5	N 41 E	3.39	7.77
18 5	43.1	+ 2 0	62 5	23 0	39.5	17	3.97.	6	2.0	N 84 W	2.11	8.39
1866	43 9	+ 2.8	71.0	28.5	42 5	7	1.67.	2	mnp.	N 42 W	3.34	7.95
1867	39 5	— 1.6	65.5	25 4	40.1	12	2.147	5	7 2	N 51 W	2.68	7.89
1868	38.0	— 3 1	64.0	9.2	54 8	7	0.990	10	5.3	N 63 W	2.43	9 24
186.	40.1	— 1.0	72.2	16 6	55.6	9	2.90.	2	0 5	N 59 W	4 03	8 91
1870	44.6	+ 3 5	67 0	29.6	37.4	9	2.145	2	0.1	N 40 E	3.55	7.03
1871	43 0	— 1.0	72.8	26.4	46.4	17	3 318	2	1.3	N 48 W	1.86	8.85
1872	40.5	— 0.6	70.0	22.7	47.3	9	0.910	5	0.7	N 68 W	3.84	9.12
1873	38 6	— 2.5	61.2	24.4	36.8	13	3.975	3	inap.	N 18 E	2 89	9.05
Results to 1872	41.11	...	66.20	19.55	46 65	9.97	2.455	3.67	2.32	N 21 W	2.67	8.17
Excess for '73	2 53	...	5.00	4.85	0.85	3.02	1.522	0.67	2.3	...	...	+ 0.88

N.B.—The publication of the May number of the JOURNAL *has been delayed for a few days, in order that the Meteorological Tables for April might be included therein.*

CONTENTS.

***** The Annual Subscription, due in January, Country Members, $3; in Toronto, $4.**