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THE CANADIAN JOURNAL.

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THE EASTERN ORIGIN OF THE CELTS.

BY JOHN CAMPBELL, M.A.,

Professor of Church History, Presbyterian College, Montreal.

I do not purpose giving a review of Pritchard's well-known book upon this subject, or of any theory yet proposed, but the results of independent investigation from an entirely new standpoint. In various papers laid before the Institute, as well as in others which have appeared elsewhere, I have undertaken to prove the great importance, in an ethnological point of view, of the genealogies of the first book of Chronicles.¹ It is among these that I find the eponyms of various 'Celtic peoples; and the concurrence of their names in various countries, from India in the east to Britain in the west, has enabled me to open up one of the most interesting fields of ethnological research. The Sumerians and Accadians are at present occupying the attention which Pelasgians and Etrurians once held, and it is, therefore, with no little satisfaction that I find the Celtic origins shedding light upon the history of these ancient peoples. It will be remembered that the Celts have ever claimed a Scythian ancestry, and, therefore, it need not be surprising to find them related to the old Scythic or Turanian stock of Babylonia.

¹ The Horites, *Canadian Journal*, May, 1873.

The Shepherd Kings of Egypt, *Canadian Journal*, April and August, 1874.

The Primitive History of the Ionians, *Canadian Journal*, May, 1875.

The Origin of the Phœnicians, *British and Foreign Evangelical Review*, July, 1875.

The Hornets of Scripture, *Presbyterian Quarterly and Princeton Review*, October, 1875.

The Traditions of the People of Mexico and Peru identified with the Mythology of the Old World, *Comptes Rendus du Congrès International des Americanistes*, Nancy, 1875.

The eponym of the Celts is in the Bible called Gilead; not he who was a descendant of the patriarch Joseph, but a much older personage, who named the region on the Jordan long years before the birth of that son of Israel.^{1*} The genealogies of the Gentile and of the Israelite Gilead are confounded in our present text of the book of Chronicles.² Etymologically, Gilead is the hard, rough, stony region,³ suiting admirably the character of the place thus named, and according with two tracts, a smaller and a greater, to which it was transferred, Homer's "Rocky Calydon," and "Caledonia stern and wild." The Gileadites were represented in the region of the Euphrates by the Chaldeans or Kaldai, a tribe—the leading tribe it is said—of the great Accad family.⁴ Originally a mountain race, they came from the borders of Armenia, in which country Khaldi, or Gilead himself, was the supreme god.⁵ The ancient British word Culdee, like Chaldean, is not primarily a religious, but an ethnic designation. Galatian and Celt are two later forms of the name Gilead. It is to be remarked, however, that Gilead has, for its third literal constituent, the Hebrew *Ayin*, which, although frequently rendered by a vowel, is, in transliteration into the Greek, and into some of the languages of the cuneiform inscriptions, generally represented by *g*, or some similar letter.⁶ Gilead thus becomes Gilgad, and appears in this form in Calicut, Calycadnus, Chalcedon. The emphasizing of this third letter weakened, in certain cases, the power of the final *d* or *t*, so that Cilicia, Chalcis, Gallocci, and similar terms, arose out of it. Chalcitis, Chalcidice, and like words, however, serve to lead back to the original root.

Thus far I had proceeded in my work of investigation some time ago, but had despaired of arriving at anything definite, for want of further materials, believing that the Bible genealogies of Gilead related to the Israelite of that name. This belief was staggered when I studied the list of Babylonian monarchs discovered by Mr. George Smith, and utterly overthrown when further investigation gave me the results which I now set forth. An early Babylonian king, about whom at present nobody knows anything but the name, was Ulam Buryas.⁷ Ulam is so rare a name, as anyone who consults

^{1*} Gen. xxxi. 47. Jacob made use of an existing name. Gen. xxxvii. 25.

² Compare Numb. xxvi. 30, and 1 Chron. vii. 17.

³ Gesenli Lexico in loc.

⁴ Rawlinson's Herodotus, App. Book 1, Essay xi.

⁵ Anthon's Clas. Dict., Art. Chaldaea. Rawlinson's Herodotus, App. Book 1, Essay x.

⁶ Vide proper names in Septuagint and Babylonian tablets.

⁷ Records of the Past, Vol. v. p. 79.

a dictionary of proper names may see for himself, that I felt justified in connecting tentatively the Babylonian monarch with a grandson of Gilead bearing an identical name, especially as he is called the son of Peresh, which bears no very distant resemblance to Buryas.⁸ I do not say that he was the same person, although I think it more than probable. Happily the coincidence led to a knowledge of facts which by no means depend upon it for their weight.

The sons of Gilead were Peresh and Sheresh. The elder of these had two sons, Ulam and Rakem; and Ulam had a son Bedan. Peresh, the horseman, is not an Israelite name, and at once, in form and etymology, directs us to Persia. Rakem, however, has Celtic connections. The word means *striped, woven of variously-coloured threads*, and accords with the Celtic *breac, brycan*, which have the same signification. The prefixed *b* is what I have so far called the Coptic article, but as I have no ground for believing that the Gileadites were ever in Egypt, it is better to regard it as an early prefix common to many languages.⁹ That I am doing no violence to etymology in introducing such a prefix in this place, will appear when I anticipate by mentioning that the Hyrcanii of Persia were called Barcanii or Paricanii. Ulam and Bedan are of uncertain etymology in Hebrew, but are significant enough in Celtic.

Independently of Gilead and the Celtic relations already indicated, the name Peresh is sufficiently near to the Bible name for Persia to call for a comparison. I need hardly say that the word is itself Persian as well as Semitic, and retains, in that language, the meaning "horseman," while it designates the Persians proper. Pezron, in his "Antiquities of Nations," is the only writer whom I have found suggesting a connection of Persians with Celts, although many have united the former people with the Germans.¹⁰ Susiana, nearest to Chaldea, is regarded as an early abode of the Persians, and its Elymais as the Elam by which the Scriptures at times designated Persia.¹¹ Elymais, however, I maintain to have been Ulam originally, inasmuch as in it we find the Ulai river, which is the

⁸ 1 Chron. vii. 16.

⁹ The Coptic Element in Languages of the Indo-European Family, Canadian Journal, Vol. xiii. Nos. 4 and 5.

¹⁰ The Antiquities of Nations, more particularly of the Celts or Gauls, by M. Pezron, London, 1706.

¹¹ Persia, in Scripture, is called Elam and Paras. The former name is that of a descendant of Shem.

only Bible proper name that etymologically agrees with Ulam.¹² Sura, Aracca, Brixia, Urzan, and Badaca, may represent Sheresh, Rakem, and Bedan. What is wanting in Susiana, however, Persis supplies. Persis, named after Peresh, and still, as Fars, denoting the horse, contained Elymaci, or the descendants of Ulam, the son of Peresh. The Rhogonis river is a well-marked trace of Rakem; and, still more remarkable, the rare word Bedan is represented by Bathina, situated upon a lake not far from Persepolis. The Mesembria Chersonesus, lying off the coast of this province, is no less a sign of original Celtic occupation than that which Humboldt found in the Thracian Mesembria.¹³ Media tells the same story. The Gelœa Mountains may or may not relate to Gilead, but Pharasias, Elymais, Rhagiana, and Batana, set forth Peresh, Ulam, Rakem, and Bedan. Rakem rises into independent existence in Hyrcania, the people of which, as I have already stated, were called Barcanii and Paricanii. As a mountainous country, we shall yet find it reproduced in many mountain tracts.¹⁴ Its district, Syracene, should indicate amicable relations between Rakem and his uncle Sheresh. There were Parsii in Gedrosia, and, although Ulam is unrepresented, Rakem appears to have left distinct traces in Rhogana, Rhagiana, and the Paricanii, while Bedan furnished Badis in the extreme west. In Aria, also, there were Calatii or Gileadites, with Parsii of Peresh and Arachoti, who may have been of Rakem. Parsii, Elamites, and Hyrcanians, with Syracenians, thus seem to have been the chief inhabitants of the Persian empire proper. The descendants of Bedan were not sufficiently removed from the centre to rise to the dignity of a nation, and the name of Gilead, except in Aria, was merged in those of his children.

It would accord with the notions of the Sanscritists to derive this and all other families of civilized men from the mountains of northern India.¹⁵ The Gileadites are found in India, but plainly as immigrants from Persia. They were the Calatii of the Ganges, of whom

¹² Dan. viii. 2. It is the classical Eulæus.

¹³ Anthon's Class. Dict., Art. Mesembria.

¹⁴ Such were Rhagiana in Media; Argæus and Arganthonius of A. Minor; Aracynthus of Ætolia; Arachnaeus in Argolis; the region of the Hercuniates in Pannonia; Eryx in Sicily; and the Hercynian Wood in Germany.

¹⁵ A being can be more absurd than to derive populations from an extremity rather than from a centre. Sanscrit, valuable as it is for comparative purposes, affords the explanation of nothing. Its high development as a language makes it of as little value for such a purpose as the Greek and Latin tongues.

the Prasii, who occupied so much of northern India, were a great division.¹⁶ The ancient Parisaria and the modern Calcutta near the mouths of the Ganges, represent also Peresh and Gilead. But the Ganges itself bears the name Padæi, and Herodotus mentions an important Indian tribe, so called, dwelling with the Calatii.¹⁷ This is the posterity of Bedan rising into notice, and beginning that system of river-naming which Padus, Baetis, and other western streams exhibit. Baetana, or Patna on the Ganges, or Padæi, indicates Bedan's right to be considered its eponym; and Bhotan, the home of the ancient Badasæ, seems to perpetuate his memory in the East. The Budini generally relegated to Sarmatia, and who have been supposed Germanic or Celtic, were probably Bedanites.¹⁸

Returning to our point of departure, which was Susiana, and proceeding westward, we find in Chaldea, the land of the Gileadites, *par excellence*. A large class of its inhabitants were the Orcheni, who were doubtless the same as the Hyrcanians, or descendants of Rakem.¹⁹ Ulam does not appear, but Pudna represents Bedan. In Babylonia, Peresh is represented by Bursia and Perisabora, Sheresh by Sura, and Rakem by Arsiana. Mesopotamia is more full. Gilead, Peresh, Sheresh, Ulam, and Bedan, are easily recognizable in the related Chalcitis, Persa, Porsica, Sarsica, Alamus, Alama, Batnae, Betonsa, and Aphadana. Armenia was the original home of the Chaldees or primitive Celts,²⁰ and there, accordingly, we discover Chaliat, Parisa, and Arsene, on which Patansana was situated, just as Arsacia is a lake of the Rhagianæ in Media, and Batthina lies on the lake of Persis. Arsiana and Arsene are softened forms of Hyrcania or Orchoene, representing Rakem. Strabo tells us of Chaldeans in Irak Arabi.²¹ These were no doubt the Chaulothæi of Arabia Felix, near whom were found Saraceni, the descendants of Sheresh, and probably the Saracens of a later time. On the Red Sea, the family of Gilead left ineffaceable records in the country of the Elamitæ, with the maritime and inland towns Pudni (Badanatha ?) and Vodona. Palestine I pass over, as in it our sources are given.

¹⁶ Herodot. iii. 38, 97. Strab. xv. 1, 26.

¹⁷ Herodot. iii. 99. Wheeler, *Geography of Herodotus*, 310.

¹⁸ Rawlinson's Herodotus. iv. 103 note.

¹⁹ Vide Bryant, *Analysis of Ancient Mythology*, i. 261. This ingenious writer connects the Orchoeni with the Hyrcanians of Persia, and the Germans of the Hercynia Silva.

²⁰ Rawlinson, in his Herodotus, i. 181 note, seems to look upon the Armenian Chaldeans as a colony, thus disagreeing with Michaelis, Adelung and Fuerst.

²¹ xvi. 1, 6.

Syria, however, carries on the Celtic stream to the north and west, furnishing, as landmarks in its progress, Chalcidico, Elemais, the region of the Urehoenses,²² and Bature, with which the large nation of the Pateua, mentioned in the cuneiform inscriptions, and placed in northern Syria, must be connected.²³ It is interesting to find Bedan developing into a nation at about equal distances to the east and north-west from the original Persian centre. From Syria the Celts passed into Cilicia and Cappadocia, unless the colonists of the latter province came direct from Armenia. Cilicia itself is a form of Gilead, in which the emphasizing of the *ayin* has caused the rejection of the final *d*. The river Calycadnus, however, exhibits the full dimensions of the word. The learned Bochart, whose etymologies I would not always vouch for, was, I think, right in rendering Celenderis as the land of Gilead.²⁴ Clitæ is a shortened form of the same. Sheresh and Ulam may appear in the Sarus and Holmi, and Rakem in Trachea. Cappadocia supplements Cilicia. To the Sarus it adds Siricis for Sheresh. Rakem once more denotes a mountain range in Argæus. Diana Perasia, worshipped at Castaballa, may denote some connection with his father Peresh. But Bedan is unmistakable in Badinum, Podandus, and Ptanadâris, the latter a word resembling Celenderis. There were Chaldæi in Pontus, as Strabo and Stephanus of Byzantium inform us, who were no doubt immigrants from Armenia. Galatia indicates a returning wave of the Celtic tide in its westward course. Its Trocmi were probably Rakem's people, with an initial *T* that we shall yet meet with, and the Epetobriges are the Bedanites, with the addition of the Celtic *brig*. Many writers connect the Phrygians with the Brigantes, but for this I have absolutely no data.²⁵ The Pitanæi, of Lycaonia, were of Bedan. Bithynia, however, is altogether Celtic or Gileadite. Here Bedan appears as in Bhotan and Patena, superseding the Elymæi of his father and the Parsii of his grandfather with his own name. The Bebrycians, or ancient Bithynians, were of Peresh, and their name connects with the Greek Buprasium and the Gallic Bibracte, the initial *B* being in each case reduplicated. Prusa also, I am convinced, was far older than the historical king Prusias, and represented a simpler form of Peresh.²⁶ Elæum may have been

²² Bryant, *Analysis*, i. 260.

²³ Vide Map of Western Asia in the Assyrian Period, Rawlinson's *Herodotus*, Vol. I.

²⁴ Gilead eretz. Bochart, *Canaan*.

²⁵ Anthon's *Class. Dict*, Art. *Brigantes*.

²⁶ Strabo (xii. 4. 4) states that Prusias, the founder of Prusa, fought against Croesus. This, at least, is evidence of its antiquity.

a reminiscence of Ulam; but Arganthonius Mous keeps up the Hyrcanian connection. Clitæ and Chalcedon unite the Bithynians with Gilead. There are other geographical names related to those already mentioned, in Mysia and Lydia; such as Pirossus, Elœa with Pitane, Pytna and the Hyrcanian Plain,²⁷ but these are sporadic, and do not belong to the main stream of migration.

Passing into Europe, Thrace betrays affinity with Bithynia. Its Celletæ were doubtless the founders of Chalcedon in Bithynia, who also built Byzantium and Selymbria. The latter word presents a Celtic form that has already appeared in the Mesambria of Persis. Selym, however, is a sibilant form of Ulam, and exhibits the Elymæi preparing for their western name of Ulam-briges or Allobroges. Gallaica was the name of the coast on which it was found. Salmydessus or Halmydessus may be another form of the same name. Byzantium, from its connection with Chalcedon, and geographical relations with Bythias and the Bathynias river, would seem to be a corruption of Bedan. I am inclined also to give this honour to the Bistones who dwelt between the eastern part alluded to and the west of Thrace, where Siris and Prusias commemorated Sheresh and Peresh. The *s* which precedes the *t* of Bistones is adventitious in other Greek words taken from oriental languages, as in *bistakion* from the Hebrew *beten*, the pistachio. Macedonia contained a large district called Chalcidice, as well as many other Gilead-like names. Baerus, to the north of Gallicum, might indicate Peresh. But, opposite Chalcidice, Pydna, near the region of Elymea, seems to reproduce the geographical nomenclature of Persia, Mesopotamia, Arabia, and Syria.²⁸ Almona, farther north, may be another form of Ulam, and the Erigon, near at hand, is plainly the river of Rakem. Although it sheds no light upon the family of Gilead, the following connection may indicate the correctness of my inductive process. In Macedonia, near Elymea, Ægestæa appears, which is the same name as the

²⁷ The Hyrcanian Plain is said to have been named by the Persians after their conquest of Asia Minor.

²⁸ It is certainly not a little remarkable to find names so similar in constant union.

In Susa	we have	Elymais and Badæa.
In Persis	"	Elymæi and Bathina.
In Media	"	Elymais and Batana.
In Arabia	"	Elamitæ and Pudna.
In Syria	"	Elamais and Batna.
In Macedonia	"	Elymea and Pytna.
In Sicily	"	Elymii and Pittineo.

Also in Eubœa and Arcadia are Elymnum and Elymia with other Gilcadite connections.

Persian Segestan, Segesto, of Pannonia, Segeste of Liguria, and Egesta of Sicily, all of which countries have most intimate relations with the Elamite family of Gilead.²⁹

Greece contained Celtic elements, especially in the closely allied populations of Ætolia and Elis. There were Gileadites, however, in Thessaly. Elatea may possibly be a form of Gilead's name, but Calathama suits better with the original. Piresia and Pyrasus should represent Peresh, and Trachin, Rakem. But the best evidence of Elamite occupation is the river Apidanus or Salambria, answering to the Bathynias in the neighbourhood of Selymbria, and the Padæi of India, to the north of which appears Selampura.³⁰ Ulam, with the *brig* termination, is here connected with his son Bedan. Potniæ, of Magnesia, establishes the identity of Bedan and Apidanus. In Epirus our search will be found not so successful. It also had an Elatæa; and Ulam might have been the original of Elæa, or better still, of Aulon, with which the Hebrew meaning of the word agrees; while Batia suggests Bedan. What is wanting in Epirus, however, may appear in Illyria. Gilead is there set forth by Claudanum and the Callicœni. The Perisadyes and Sesarethii no doubt exhibit Peresh and Sheresh. Ulam appears with a *D* prefix in Delminium, and perhaps in Dalmatia. Putamnus, Epidamnus, and Bassania, are three different forms of Bedan; and Dyrrachium, the other name of Epidamnus, must have come, like Trocni, from Rakem. Evidence will yet appear for accepting Bassania and Dyrrachium in this connection. Already I have suggested the unity of Gilead and rocky Calydon in Ætolia. Chalcis, the modern Galata, near at hand, confirms it. Olenus may give us Ulam, but Aracynthus Mons and Trichonis Palus are alike memorials of Rakem, the former connecting with Hyrcania, Argæus, Arganthonius, &c., and the latter with the Trocni and Dyrrachium. The Apodoti, with the town Phytæum on the Palus, commemorate Bedan. Phocis has Elatea, Trachin,

²⁹ The Sicilian Egesta was closely connected with the Elymii. The Segustani of Gaul, who dwelt in the immediate vicinity of the Allobroges, exhibit the same phenomenon.

³⁰ The termination bria, bora, pura, appears at the very commencement of our researches. There was a Mesambria off the coast of Persia; a Selampura in India; a Perisabora, or ancient Presburg, in Babylonia. We find the same form connecting Bedan in the Epetobriges of Galatia. Perisabora, Selymbria and Epetobriga show three descents, or Peresh, Ulam, and Bedan.

Bedan's name, which has maritime, or at least water significations in the Celtic languages, was fitly applied to rivers. Thus the Padæi, or Ganges; the Badus of Syria; the Bathynias of Thrace; the Apidanus of Thessaly; the Palus or Bodincus, the Padusa, the Bedesis, the Batinus of Italy; and the Britis of Spain received their names from it.

and Pedicæ; Bœotia has Holmia, Eleon, Delium, Potnia, and Peteon, with Orchomenos for Rakem, and Chalcis on the opposite coast of Eubœa for Gilead. There was also an Elymnium in Eubœa. On the Isthmus we find Chalcis, Piræus, Saron, and Olmiæ. Attica is fuller, in Chollidæ, Prasiæ, Piræus, Alimus, Halimusia, Erasinus, and Aphidna. Peloponnesus has a few traces of Celtic occupation. In Arcadia the Celadon, the Parrhasii, Elynia, and Orchomenos must refer to Gilead, Peresh, Ulam, and Rakem. Argolis contains another Celenderis, reproducing that of Cilicia, a Saron, an Elæus, a Troezen, and an Arachnæus Mons. In Elis, a region which mythology intimately connects with Ætolia, we find Chalcis and the Cladeus, with Buprasium, a Bebrycian form of Peresh. Messenia furnishes Pharis and Auton; and Laconia contained Calathion, Prasiæ, Brysiæ, Pharis, Delium, and Pitane. Among islands, the Calydnae, and Celæussa or Rheneia of the Cyclades, were Gileadite, while Paros and Syros of the latter group, evidently received their names from the descendants of Peresh and Sheresh. Peparethus and Solymnia, off the Thessalian coast, seem to have been peopled by the Peresh and Ulam family. In Crete we find Prasus, Olus and Pytna.

Mœsia was largely Sarmatian, but in the east, Callatis, Trosmi (Troemi) and Bizone (Byzantium) indicate Celtic occupation. Further west on the Danube, however, we meet with Almus and Bononia, setting forth Ulam and Bedan. The modern name of Bononia, which is but a restoration of its original designation, is Bodon, and thus we are furnished with a solution of the difficulties presented by the word Pannonia, which is preëminently the land of the Bedanites. All writers are agreed that Pannonia's most ancient population was Celtic.³¹ There we find Coletiani. It contained a lake Perso, reproducing the lakes of Persis and Hyrcania, and on it Ulmus named after Ulam was situated; while Bassiana near at hand, by its modern name Bodonhely, justifies the association of the Illyrian Bassiana with Bedan. The river Parisus keeps up the Peresh connection; and another Ulmi and another Bassiana in the south proclaim the presence of the Ulam and Bedan line of his family. Meanwhile Rakem appears, Hyrcanian-like, in the Hercyniates, a mountain race, and north of these is the Volcæ Palus, on which Tricciana recalls Trichonium on the Trichonian Lake of Ætolia.

³¹ Vide Strab., vii. 5, 2 seq.

This Volcæ Palus must connect with the Volcæ or Arecomici (Hercuniates) of Gallia Narbonensis; with Lacus Vulsiniensis of Etruria, and the Volsci of Latium, which will yet be proved to have been centres of the Gileadites; with Vologesia of Babylonia north of the Orcheni; and with the Volsas Sinus of northern Caledonia.^{31*} I do not know whether the Bolitæ on the borders of Aria belong to this Volcic family, nor can I at present tell how it and that of the Ægestani relate to the stock of Gilead. The fact of a repeated geographical connection is, however, evidence of some importance. Still another tribe, bearing the names Savadii in Persia, Sabæi in Arabia, Sophenes in Armenia, Sabæi in Cappadocia, Sapæi in Thrace, Savii in Pannonia, Suevi in Germania, &c., maintains constant geographical relations with the line of Gilead. Of these people also, at present I know nothing. The Varciones of western Pannonia are probably the same as the Hercuniates of the east, the sole difference between the names being that which we have already found between Barcanii and Hyrcanii. In Vindelicia, Vetoniana still furnishes a trace of Bedan, and Biriciana and Bragodurum may be forms of Peresh. The Alauni of Noricum were I think the people of Ulam, appearing in a Gallic and British form.³² Vetoniana again carries forward the Bedanites; and Fasiana and Bidæum may be variations of the name. In the south of Rætia we meet with the town Sarraca and the Ollius river as reminiscences of Sheresh and Ulam. The Brigantii of the northwest are the Barcanii of Rakem, the Galli Braccati, who were not so much the wearers of *braccæ*, which it is well to remember were articles of dress in use among Persians, Germans and Celts, but rather of the *brychan* or *brygan* which is the Scotch plaid of various colours, answering as no other word does to the Hebrew *Rakem*.³³

Italy, it is generally conceded, contained a large Celtic element. In Venetia, however, Vedinum, a form of Bedan, is the only trace which at present concerns us, unless we suppose that some of the places bearing the name Julius received it from a Gallic ancestor of the people inhabiting them rather than from the Caesar of that

^{31*} To these must be added the Velocasses of Gaul, who dwelt between the Caleti and Parisii.

³² The Alauni, who may be the Alans, do not appear as a nation, Alemanni and Allobroges being the names by which they were known; but Alauna and Allieui in Italy, Gaul, and Britain mark their course.

³³ The Erse *braccain*, meaning to speckle, variegate, chequer, embroider, is identical in meaning with the Hebrew *rekem*. Breacan, a plaid, in the same language, agrees with the Welsh *brychan*. It was the dress of the Brigantes or Rakemites.

name. This seems more than probable, and, if true, would refer us to Ulam. Gallia Cisalpina is more important. The Galli are themselves Gileadites. Brixia gives Peresh; Ollius and Allieni, Ulam; Regium and Bergomum, Rakem. But India is reproduced in the Padus or Bodincus, on which Padinum answering to Patna, was situated. Two other rivers, the Padusa and the Bedesis, with Fidentia, indicate the supremacy of the descendants of Bedan. Liguria also preserved Gilead's memory in Clastidium, and that of Rakem in Ricina and Rigomagus. Pedona, also called Dalmazzo, thus united the names of Bedan and his father Ulam, the latter designation answering to Dalmatia and Delminium and finding the parallel, if not the explanation, of its final *z* in Olmuz, the modern form of a Bohemian Ulmi. Bodincomagus and Potentia are other relics of Bedan. Etruria, the Volscian connections of which I have already indicated, exhibits relations with Gilead and Peresh in Calletanis, perhaps in Clusium, and in Perugia.³⁴ Not far from the latter place was Vettona of Umbria, which also contained Pittinum and Sarsina, thus adding Bedan and Sheresh. Rakem appears in Ricina of Picenum, and there also Bedan had memorials in the Batinus river, Pitinum and Potentia. Latium, where Volsci were found, showed its Celtic side in Collatia, Sora, Almo, Tarracina, and Pedum. Bedan's supremacy is still visible in Pitinum and Fidenæ of Sabinum; but his name undergoes a change that may indicate relations with the namers of Aphadana in Mesopotamia, Apidanus of Thessaly, and Aphidne of Attica, in Aufidena and Æbutiana, which appear along with Calatia in Samnium. Campania repeats the tale of migration in Calatia and Betina; and Apulia, in Collatia, Galesus, and Batuntum. Lucania revived the memory of Sheresh in Siris, and added Potentia to the numberless records of Bedan. Rhegium of Bruttium must have been named by Rakem's descendants, as it was a Chalcidian colony.³⁵ In Sicily the long missing form of Ulam's name reappears in the neighborhood of Ægesta, where Elymus the Trojan left the Elymii.³⁶ Eryx near at hand may, as a mountain name and that of

³⁴ Perugia must have been an ancient seat of the Parisii. Trasimenus Lacus, answering to Trichonis, &c. and Tarquinii, seem with Perugia to suggest that the Tyrseni of Tarchon were Rakemites, which the original Rasena appears to confirm. The Vetulonii of Tuscany and its Lucumos serve to indicate, what other connections render certain, that the family to which Gilead belonged was that of Bethlehem, the name Lucumo coming from Lechem, and Vetulonia preserving the entire name. But *Uluas*, of the cuneiform inscriptions, should connect with this line.

³⁵ These Chalcidians were of Eubœa. Pausanias, iv. 23.

³⁶ Strab. xiii. 1, 53.

a king of the Elymii related to Butes, set forth Rakem. Syracuse seems to indicate that Sheresh had the chief representation in the island,³⁷ but, Gilead, Peresh, and Bedan were worthily commemorated in Galata, Pergusa, Bidis and Pittineo. Corsica had a Pitanus.

The western peninsula of Europe contained a large Celtic or Gileadite population. Gallia Cisalpina and northern India live again geographically in Bætica, for the Bætis, with its town Bæton, is the counterpart of the Padus with Padinum and the Padæi with Patna. Ulam accompanies Bedan in the two different forms Uliā and Selambina, while Regina and Urgaon, which should connect with the more northern province, show that the descendants of Rakem dwelt in harmony with those of his brother. In Lusitania there were Celtici. Arucei is a Spanish Eryx, and Brigantum indicates a western extension of the Brigantes. Elmantica or Salamanca doubtless arose from the presence of Ulam's descendants, which the Vettones or people of Bedan so plainly confirm. The very name of Tarraconensis, if its modern equivalent Aragon did not recall Rakem, would do so by its resemblance to Tricciana, Trichonis, and similar words already connected with him. The Callæi and Caladunum, Bergusia and Betunia link with his the names of Gilead, Peresh, and Bedan, while other memorials of himself are found in Barcina and Brigeicum. In Gaul the Caletæ of Normandy preserve intact the Gileadite name. Not far from them dwelt the Parisii, whose city Paris was a western version of Persepolis and Parisaria of the Persii and Prasii, or a northern Perusia. Bibrax, Bibracte, and similar names exhibit a reduplication of the initial letter of the same word, such as we have found in Bebrycia and Buprasium. The Betasii bordering on Batavia were Bedanites of the same stock. In the west of Gaul, Alauna, Arægenus and Rignæa were memorials of Ulam and

³⁷ As Sheresh is mentioned alone in the genealogy, it is difficult to trace his line, save by such analogies of form as Syracuse and Pergusa present. It is not impossible that the Serica of North-Eastern India, whence the Serici or Emodi Montes took their name, as well as the Serus river of what is now Siam which flowed through a region Chalcitis, indicate ancient seats of the family of Sheresh. With these, Sariga in Margiana should connect, as well as Suragina in Bactriana. The Bautes and Bautistus rivers of the Seres seem to unite them with the stock that named the Padæi, Padus, &c. These Seres, or workers in silk, seem fully identified with the Chinese. Bryant, in his Analysis, v. 227, represents them as belonging to the Scythic family. In the third volume of the same work (p. 425) he explains the fable of Arachnæ as arising from the skill in weaving of the Orchæni of Chaldea. Itakem, the inventor of tartan, may thus have been of the same stock as the silk workers of the far east. It is worthy of note that the Celtic for silk is *strig*, *seric*, and for the silkworm *seiricean*. The Saracens were silk workers, as our English word *saracen* proves. It would be not a little remarkable to find the Chinese and the Celts of Europe so closely connected.

Rakem. Petenesca of the Helvetii answers to Bodencus, Betonsa, and other appellations of Bedan's descendants. In the south, the Volcæ or Arecomici, who have already been noticed as the progeny of Rakem, were found in close proximity to the Allobroges, whom I have identified with the Elamites of Ulam. Selampura, Selymbria, Salambria, exhibit the form of Ulam's name (Ulam-Buryas) out of which the term Allobroges was developed. A confirmation of this is found in a statement of Latham's that the termination in *neus* which appears in Bodencus is characteristic of the Allobroges.³⁸ After quoting examples, he cites also Habitancum as showing a British analogy, in apparent ignorance that the latter name is peculiarly Allobrogic.³⁹ Alamon, Bergusium, Bautæ, and Batiana were towns in the region of the Allobroges and Arecomici, setting forth Ulam, Rakem and Bedan. Before dismissing Gaul it is worth observing that the tribe of Celtic barbarians led by Brennus was that of the Prausi, who were the Persii, Prasii or Parisii of Peresh,⁴⁰ and that some of their posterity were known as the Bathanati or people of Bedan.⁴¹ In Bathanatus, the head of this family, we must find the Baton whom Strabo mentions as chief of the Pannonians.⁴² The Gileadites passed into Britain and named the Caledonia Silva, beginning at Carlisle. In that region also we find Calatum, preserving the same name. There also the Parisii appear, and with them the Brigantes, while Alauna, Elius, Alone and Habitancum help to

³⁸ *Ethnology of Europe*, 52.

³⁹ Habitancum in the north of Britain is a form uniting Apidanus or Aphaduna with Bodincus, and appears in a strongly marked Gileadite region. While the reminiscences of Bedan in the south of Britain exhibit no prosthetic letters, e. g. Badon, Boduni, Bedan-ford, those in the north are always preceded by a foreign vowel, as in Habitancum, Ebuda, Epidii. A similar phenomenon is observable in Mesopotamia, Galatia, Thessaly, Ætolia, Attica, Illyria, and Samnium. Some minor ethnic difference may account for the variation.

⁴⁰ Strab. iv. 1, 13.

⁴¹ Athenæus, vi. 25.

⁴² Strab. vii. 5, 3. Brennus entered Pannonia, Pausan. x. 19. Phæthon, well known in classical story, whom Pausanias and others connect with Liguria and the Padus or Eridanus, was probably Bedan himself; his father Helius being Ulam, whose name the Greeks being ignorant of and receiving under the form Eulæus, thus converted into a well known word. The original Eridanus was the Jordan of Palestine. The connection of amber with this story is that of the Gaelic Ambrones. These I have connected with Zimran, the son of Keturah. Zimran in Hebrew means "a song," and is identical with the Celtic "amhran," bearing the same meaning. Amber is itself a Celtic word, "omar, omra, ombra." The Greek elektron is derived from Electra, a form of El Keturah, or the name of Zimran's mother with the Arabic article. Sacal, the Coptic for amber, seems to point to Eshcol, who, in all probability, was the brother of Keturah. The amber stones of the Celts in England and elsewhere were sacred monuments, and from them probably, small things taking their name from great, amber, as a sacred substance, received its designation.

establish the fact of an ancient occupation by the family of Peresh in all its branches. In the south-west about the Severn, the same stock appears, in Ariconium, another Alauna, and in the large tribe of the Boduni or Dobuni, to whom Badon or Bath belonged. Bedford or Bedford, farther to the east, is an indication that Bedan's descendants once had a settlement there. Besides the name Caledonia, Galda or Galloway, and Glota, or the Clyde, kept up the memory of Gilead. Galda was also called Brigantum, and may have received its population from the Brigantes in the south of Ireland. A Caledonian Alauna represented Ulam, and the name of his son Bedan was still conspicuous in Epidia and Ebuda, with which the Volsas Sinus united the Volcæ of the continent. I am persuaded that the ancient British and Irish annals contain materials for restoring the history of the Gileadite line back to the times of their earliest achievements on the banks of the Euphrates.

Had I been framing a theory of Celtic migration it would have seemed suicidal to include in it notices of German tribes, but this is, by my inductive process, absolutely necessary. Certain it is that Persians and Germans have been shown to be closely allied; and ethnology has not yet settled the Cimmerian question on the side either of Germanic Cimbri or Celtic Cymri. The mountain tract of Hyrcania cannot be dissociated from the Hercynian Forest, and it is reasonable to believe that the enclosed Varisti were the posterity of Peresh. The Batini farther to the north were of Bedan. Olmuz of Bohemia is a memorial of Ulam, and Bamberg or Bedan-berg on the Maine, of his son. The Frisii of Batavia were the Parisii under Germanic influences, and the Byrchanis Insula off their coast, a link to bind Rakem to Peresh. The modern Jellum retains the name of Ulam, and Bedum, with the Baduhennæ Lucus and the word Batavia itself, indicate the high importance of Bedan. It is in Swabia however, which good authorities hold to have been originally Celtic, that the German branch of the Gileadites comes most prominently into notice.⁴³ The very names Baden and Wittenberg (Wurtemberg) present two different forms of Bedan. Baden itself, as Aquæ Pannoniæ, confirms the connection; and the Lake of Constance, as Bodamicus Lacus or the Bodensee, puts it beyond all doubt. But the Brigantes dwelt upon this lake, and another name for it was Brigantinus Lacus, thus uniting Rakem with Bedan. The Vargiones

⁴³ Latham's Ethnology of Europe, 197.

of this region were the Rakemites or Brigantes under another designation. Meanwhile Ulam is not lost sight of, for the modern Ulm retains what the ancient Alemanni once imposed in memory of their ancestor.⁴⁴ Even Scandinavia must have seen an offshoot of this great family, for Phiræsiî dwelt there, and Ulea and Bothnia are among their geographical traces.⁴⁵

There were Pharusii in Libya, and a Chelida. Barca of Cyrenaica and Pithon may also have set forth Peresh and Bedan.⁴⁶ Battus, even in the days of the ancient Pharaohs who preceded Moses, was the name of the chief ruler of Cyrene, and, although I cannot think that the original Bedan removed to so great a distance from the dominions of his father Ulam, in Babylonia or Susiana, the well-known presence of Celtic traces in northern Africa lead me to believe that a branch of the family of Peresh in the line of Bedan colonized Cyrene and adjoining regions on the Mediterranean coast.⁴⁷

Let it not be supposed that I profess, in setting forth the migrations of the family of Gilead, to account for all the Celtic tribes. I have simply accounted for those who imposed upon the whole race, if men will call it so, the name of Celt. There were numberless other Celtic families that traced no descent from Gilead and his sons. One of the most important of these was that which descended from Zimran, the eldest son of Abraham by Keturah, who seems to have married Hammoleketh or The Queen, a sister of Gilead, and thus to have been counted as part of the Gileadite line.⁴⁸ How I have arrived at a knowledge of this fact I leave unstated for the present, as I propose devoting a paper to the subject. The Kaldai were the leading tribe of the Accad. The descendants of Zimran were the Sumerians. They accompany the Gileadites throughout their whole course. Samaria in Hyrcania; Comaria in India; the Sumerians of Assyria and Babylonia; the Zamareni of Arabia; Thymbrium of Phrygia; Chimæra of Lycia; Smyrna of Lydia; Thymbra of Mysia;

⁴⁴ Latham does not consider the Alemanni to have been Germans, but a mixture of populations, with the Germanic element preponderating. They were clearly Elamite or of Ulam. The meaning "all men" or Allophyll is unreasonable.

⁴⁵ Ptolemy, ii. 2, 33. These Phiræsiî were Frisians or Parisii.

⁴⁶ According to Stephanus of Byzantium, Barca was founded by a Perseus, from whom probably it received its name.

⁴⁷ Lenormant & Chevalier's Ancient History of the East, l. 260.

⁴⁸ 1 Chron. vii. 18. My means for discovering the name of the husband of Hammoleketh are found in those of her three sons. In Greek, the name by which Zimran was best known is Amphiarus. He was the Babylonian Smirm or Zimarus, and the ancestor of the Arabian Homeritæ, as we learn from Sozomen.

Cimmerians of the Tauric Chersonesus; Tempyra of Thrace; Comarus, Tomarus, Chimerium, and Ambracia of Epirus; Camara and Cimarus of Crete; Ambre of Vindelicia; Umbranum of Gallia Cisalpina; Umbria with Camerinum; Camarina of Sicily; Samara, Camaracum, the Ambarri and Ambrones of Gaul; the Cymri of Britain; the Cimbri, Gambrii and Ambrones of Germany; and Someros of Libya, are a few of the traces of the Sumerian or Zimranite brethren of the Gileadites. Pezron saw plainly the connection indicated, and brought his Celts from Persia, where he found them as Comarians, whom he supposed to have been the descendants of the patriarch Gomer.⁴⁹ Gilead and Zimran, the ancestors of Kaldai and Sumeri, Celts and Cimmerians, were contemporaries, and must have flourished in the days of Isaac the son of Abraham. They were thus much later than the eponyms of the Egyptian Horites and Hycsos, and were themselves preceded in Babylonia by ruling families of Ionians and others.⁵⁰ Ulam-Buryas, if he really be Ulam the son of Peresh and grandson of Gilead, appears on the lists at the right period, or about 1600 B.C., from which date the Elamites might count their time of existence; the Persi preceding them by fifty and the Celts by a hundred years.⁵¹

It will be observed that I have abstained from introducing mythological data into my circle of comparisons, not because these are wanting, although it is true that they are not so abundant as in many other cases, but because the geographical evidence is so strong as not to stand in need of any such assistance. The mere concurrence of words so distinctive as Gilead, Peresh, Sheresh, Ulam, Rakem, and Bedan in a single locality, would be a remarkable coincidence. I cannot therefore imagine that the unworthy sneer at verbal similarity and false analogies, with which similar cases of induction have been treated, should continue to be visited upon the results here set forth, by any honest thinker. Men to whom theories are dearer than truth, and old prejudices than increase of knowledge, will find a way of escape out of mathematical demonstration. It is enough that scholars who can appreciate the nature of the evidence I have given will also appreciate the importance of the results obtained. It remains that I tabulate these results :

⁴⁹ Antiquities of Nations, Book i. ch. 3.

⁵⁰ Vide the Horites, *Canad. Journal*, May, 1873. The Shepherd Kings of Egypt, *Canad. Journal*, April and Aug., 1874; and the Primitive History of the Ionians, *Canad. Journal*, May, 1875.

⁵¹ Vide the Early History of Babylonia, *Transactions of the Society of Biblical Archaeology*, l. 1.

SCRIPTURE GENEALOGY.	GILEAD.	PERESH.	SHFRESH.	ULAM.	RAHEM.	BEDAN.
PERSIA—						
Susiana =			Sura	{ Ulai Elymals	{ Aracca Brixia Tragonico	Badæa
Persis =		Persepolis		Elymael	Rhagonis	Batthina
Media =	Gelœa?	Pharasia		Elymals	Rhagiana	Batana
Hycania =			Syracene		{ Barcanh Paricanni	
Gedrosia =		Parsii			{ Rhogana Rhagiana Paricanih Arachoti?	Badis
Aria, &c. =	Calatii	Parsii	{ Sariga Suragana			
INDIA	= { Calatii Calcutta Calicut Chalcitis	{ Prasii Parisaria	{ Serici Serus	Selampura		{ Padæi Badasæ Batana Bhotan Patna Padna
CHALDEA	= Kaldai				Orcheni	
BABYLONIA	=	{ Bursia Perrisabora	Sura		Arsiana	
MESOPOTAMIA	= Chalcitis	{ Persa Porsica	Sareisa	{ Alanus Alama		{ Batnæ Betonsa Aphadana Patansana Pudni Badanatha Vodona Batnæ Patena
ARMENIA	= Chaliat	Parisa			Arsene	
ARABIA	= Chaulothæi		Saraceni	Elamita		
SYRIA	= Chalcidice			Elemals	Urchoenses	
ASIA MINOR—						
Cilicia =	{ Calycanus Celenderis Clita		Sarus	Holmi	Trachea	
Pontus and Cappadocia =	Chaldæi		Siricis		Argæus M.	{ Badinum Podandus Ptanadaris Epeto-briges
Galatia =	Galati				Troemi	
Bithynia =	{ Chalcedon Clita	{ Bebryces Prusa		Elæum?	Arganthonius	
Other Provinces =		Pirossus		Elœa	{ Pergamus Hyrcania	{ Pitane Pytna Pitanaei Bythias Byzantium Bathynias Pytna
THRACE	= { Celleta Gallaica	Prasius	Siris	{ Selymbria Salmydessus		
MACEDONIA	= { Chalcidice Galicum	Bærus		{ Elymea Alinona	Erigon	
GREECE—						
Thessaly =	Calathama	{ Piresia Pyrasus		Salambria	Trachin	{ Apidanus Potniæ Batiæ Apydoti Phytæum
Epirus =				Aulon		
Ætolia =	{ Calydon Chalcis (Galata)			Olenus	{ Aracynthus Trichonis	
Phocis =	Galata				Trachin	Pediæa
Boeotia =				{ Holmia Eleon Delum Elynnium	Orchomenos	{ Potnia Peteon
Eubœa =	Chalcis					
Attica =	Chollidæ	{ Prasie Piræus		{ Almus Halimusia	Erasinus	Aphidna
Corinth =	Chalcis	Piræus	Saron	Olmiæ		
Argolis =	Celenderis		Soron	Elæus	{ Arachnæus Troezen Orchomenos	
Arcadia =	Celadon	Parrhasii		Elymia		
Ellis =	{ Chalcis Cladeus	Buprasium				
Messenia =		Pharis		Aulon		
Laconia =	Calathion	{ Prasie Brysiæ Pharis		Delium		Pitane
Islands =	{ Calydonæ Celadussa	{ Paros Peparethus Prasus	Syros	Solimnia		
Crete =				Olus		Pytna
MÆSIA	= Callatis			Alinum	Trosmi	{ Bizone Bononia or Dodon

ILLYRIA	= { Claudanum Callicocui	Perisadyes	Sessrethii	{ Dalmatia Delminium	Dyrrachium	{ Putampus Epidannus Bassiana
PANNONIA	= Coletiaui	{ Perso Parisus		{ Ulmi Ulavam	{ Hercunates Varciones Tricciana	{ Bassiana or Bodon-hely Vetoniaaa
VINDELICIA	=	{ Briciana Uragodurum				Vetoniaaa
NOBICUM	=			Alauni		{ Vetoniana Fasiana
RHAETIA	=		Sarraca	Ollius	Brigantii	
ITALY—						
Venetia	=					Vedinum
Gallia	=					
Cisalpinga	= Galli	Brixia		{ Allieni Ollius	{ Regium Bergomum	{ Padus or Bodineus Radinum Padusa Bedesia Fidentia Bodincoman- gus Pedona Potentia
Liguria	= Clastidium			Dalmazzo	{ Ricina Rigomagus	
Etruria	= { Calletanis Clusium?	Perusia			{ Tarquinii Trasimenus	
Umbria	=		Sarsina			{ Vettona Pitinum
Picenum	=				Ricina	{ Batinus Pitinum Potentia Pedum
Latiua	= Collatia		Sora	Almo	Terracina	{ Pitinum Fidene Anidena Ebutiana Betina Batuntum
Sabinum	=					Potentia
Samnium	= Calatia					
Campania	= Calatia					
Apulia	= { Collatia Galesus					
Lucania	=		Siris			
Bruttium	=					
SICILY	= Galata	Pergusa	Syracuse	Elymii	{ Rhegium Eryx M. Tyracina	{ Bidis Pittineo Pitanus
CORSICA	=					
SPAIN—						
Baetica	=			{ Uha Sclambina Ehmanica	{ Regina Urgaon Arueci Brigantum Aragou Barcus Brigeium Arecomici	{ Batis Bacton Vettones Betunia
Lusitania	= Celtici					
Tarra- conensis	= { Calleci Caladunum	Bergusia				Betunia
Gaul—						
Narbonensis	=	Bergusium		{ Alamon Allobroges Alauna	{ Rigunea Aregenus Rigomagus Brocomagus	{ Baute Battana Petenesca Betasi Bathanati
Lugdunensis	= Caleti	{ Parisi Bibracte Bibrax Briatacus M. Prausi				
Belgica	=					
Migratory	= Galati					
BRITAIN—						
Max. Caes.	= Calatum	Parisi		{ Alaunus Alone Alauna	Brigantes	Habitancum
Other Prov.	=				Ariconium	{ Badon Boduni Bedan-ford Epidii Ebuda
Caledonia	= { Galda Glota	{ Varze or Forres?		Alauna	Brigantum	
Hibernia	=				Brigantes	
GERMANY—						
Hermiones	=	Varisti		Olmuz	HercyniaSil.	{ Batiui Bedan-berg Bedum Briduhenna Lacus, Batavia
Ingavones	=	Frisii		Jellum	Byrchanis	{ Bodensee, or Bodamicus Lacus, Baden, or Aqua Pannonia. Wittenberg Bothna
Istevones	=			{ Alemanni Ulm	{ Brigantes Brigantinus Lacus, Vargiones	{ Bothna Pithon Battus
Scandia	=	Phircesii		Ulea		
AFRICA	= Chelida	{ Pharusii Barca				

¹³ In the above list, in addition to the mountain tracts connected with Rakem and the rivers associated with the name of Bedan, we find rivers bearing the names of all the other members of the family, including Rakem. Gilead furnishes the Calycadnus, Celadon, Cladens, Galesus, and Clyde; Peresh the Parusis; Sheresh the Serus, Sarus, and Siris; Ulam the Ulai; Salambria, Ollius, Almo and Alaunus; Rakem the Rhogonis, Ergon and Erasinus. Several of the names are found in connection with lakes; Batthina with a lake in Persis; Rhagiana with one in Media; Chaliat and Patansana with Arsene palus in Armenia; Phytæum and Trichonium with Trichonis palus in Ætolia; Prasiæ palus in Thrace; Claudarum with a lake in Illyria; Ulmum with Perso Lacus, and Tricciana with Volcææ palus in Pannonia; Brigantia with Bodamicus or Brigantinus lacus in Germany; Perusia with Trasimenus lacus in Etruria; Petenesca with a lake of the Helvetii, &c. Important peoples are represented by the various names. Gilead himself furnishes the Calati, Chaldees, Galatians and Celts; Peresh the Parisii, Prasii, Bebryces, Parrhash, Perisadyes, Parisii, Prausi, Frisii, and Pharusii; Sheresh, the Seres, Saraceni and Sesarethi; Ulam the Elamites, Elamitæ, Elymæi, Dalmatians, Alauni, Alemanni and Allobroges; Rakem, the Hyrcani or Paricani, Orhani, Troemi, Hercuniates, Varciones, Brigantii, Rasena or Tyrseni, Arecomici and Hercynii; and Bedan, the Budii, Padiæ, Patenac, Epetobriges, Bithynii, Apodoti, Pannonians, Veltones, Bathanati, Boduni, Epidii, Batavians, and Batini. Connected with the family of Gilead, perhaps as parts of that family descending from yet unknown ancestors, we have found the Egæstæans and Volsci. They were of Segestan in Persia, where there were Elamites and Hyrcanians; Egæstæa in Macedonia, in proximity to Elymea and Pydna; Segeste in Pannonia, where were Perso, Ulmum and Hercunates; Segeste in Liguria, between Ricina and Portus Erycis; Egæsta in Sicily, in proximity to Eryx and the Elymi; Segustani in Gaul, near the Allobroges, Arecomici and Ambarri. The Volsci have left similarly connected traces: Vologesia in Babylonia, north of the Orhani; Volcææ Palus in Pannonia, on which was Tricciana of the Hercuniates; Vulsiniensis Lacus in Etruria, in which Tarquinii may give Rakem; Volsci in Latium, among whom was Tarracina; Volcæ in Gaul, connected with the Arecomici; Velocasses also in Gaul, north of the Parisii; Volsas sinus in Caledonia, opposite the Ebudæ. It thus appears that the Segestani and Volsci were families of the Rakemites. Many other tribes will be found to occupy similar subordinate positions. Besides the descendants of Zauran, who furnish the Cymri, Cumbri, &c., those of the other sons of Abraham by Keturah will be found to have contributed to the Gallic stock. The Aquitani, for instance, were in all probability the progeny of Jokshan. There is a form of Rakem's name which has been before us that calls for special notice. It is that which appears in Trachonitis, Tragonice, Trachea, Troemi, Trachin, Trichonis, Trichonium, Troezen, Troemi, Dyrrachnum, Tricciana, Trasimenus, Tarquinii, Terracina and Tyracinae. Already we have found Rakem preceded by a P or B, as in the Paricani and Brigantes. In ancient languages the letter *r* rarely occupies an initial position, and of the letters which are found to usurp this position in words originally commencing with *r*, the most common are *p* or *b*, and *t* or *d*. The latter may be the relic of the old Semitic particle or article *eth*; or of the Coptic *eit*, which answers to the Hebrew *be'et*=the house of; or a simple determinative of locality common to all languages more or less. Thebes in Egypt was Te-Hapi. In Palestine Tachmonte, Taanach, Tiphshah come from Hachmon, אַחַמּוֹן and Paseah respectively. The same phenomenon is observable in the Tyrseni, whose original name was Rasena.

It is somewhat strange that Trachea, Trachin, &c., in Greek should answer to Gilead in Hebrew, as denoting "a hard, rough, stony region." An analogous case, which may be a mere coincidence, appears in the Greek *chalcos*, brass, which is the root of many Gileadite names, such as Chalcis, Chalcidico, Chalcedon. The word brass is Celtic, and appears as *pres*, *pras*, in the Welsh and Erse, which may represent Peresh, as *chalcos* represents Gilead. It is worthy of note that the Persian word is very similar to the Celtic. The Chaldeans manufactured bronze, the ancient brass, from a very early period, and probably gave their name as Chalcidians or Prasiu to the metal. The Chaldæi of Pontus were metallurgists. The Gauls and ancient Britons also wrought in metals.

ON THE LEADING GEOLOGICAL AREAS OF CANADA.

BY E. J. CHAPMAN, Ph. D.,

Professor of Mineralogy and Geology in University College, Toronto.

(Continued from page 22.)

PROVINCE OF QUEBEC.

This Province may be subdivided geologically into four principal areas, comprising: (1) The Laurentide, or Northern Crystalline District; (2) The Upper St. Lawrence, or Western Palæozoic District; (3) The Appalachian, or Eastern Metamorphic District; and (4) The Anticosti, or Eastern Palæozoic Area.

(1.) *The Laurentide District.*—This is essentially a region of ancient crystalline strata—rocky and mountainous in character: an eastward extension of the Laurentian districts of Ontario, but with certain special features of its own. It comprises the wide expanse of territory lying between the Ottawa River and Labrador, with the exception of a comparatively narrow strip of country (occupied by Lower Palæozoic formations), extending along the St. Lawrence from the junction of the two great rivers to a point a short distance below the city of Quebec. It is traversed by the Laurentide Mountains, proper, which form within it several broken ranges curving roughly parallel with the course of the St. Lawrence. The more southern of these gradually approach the river, and run closely adjacent to it along the lower part of its course. The average height of the Laurentides, generally, is from about 1,200 to 2,000 feet, but at one or two points they reach an altitude of nearly 4,000 feet above the sea. Numerous rivers rise amongst them. Some of the more important comprise: the Rivière du Moine, the Gattineau, the Rivière du Lièvre, the Rivière Rouge, and the Rivière du Nord, flowing into the Ottawa; and the l'Assomption, Chicot, St. Maurice, Batiscan, Ste. Anne (Portneuf), Jacques Cartier, Montmorenci, Ste. Anne (Montmorenci), Murray, Saguenay, Moisie, and other eastern rivers, flowing into the St. Lawrence.

The rocks within this region consist mainly of Lower or typical Laurentian strata, overlaid in some few localities by feldspathic rocks of the Upper Laurentian or Labrador series. The Laurentian strata proper, are composed essentially of vast beds of micaceous and syenitic gneiss, hornblende rock, and quartzites, with interstratified bands of crystalline limestone and oxidized iron ores. Valuable deposits of the latter occur, especially, in the townships of Hull, Templeton, and Grenville, on the Ottawa. As a rule, these Lower Laurentian strata are more or less strongly tilted, corrugated, or otherwise disturbed. They are also very generally traversed by granitic or syenitic veins, and are broken through in places (more especially in Wentworth, Chatham, and Grenville, on the Lower Ottawa) by enormous masses of eruptive syenite and greenstone. The crystalline limestones very commonly contain numerous examples of diopside, phlogopite, zircon, sphene, and other crystallized silicates; and they are associated in many places with workable amounts of graphite and fluo-phosphate of lime, as in the townships of Buckingham, Portland, Lochaber, Grenville, &c. The Upper Laurentian or Labrador formation is represented principally by thick beds of anorthosite or feldspar rock, with associated feldspatho-pyroxenic beds and interstratified gneissoid rocks. Titaniferous iron ore is a frequent accompaniment of these higher strata, and in some localities, as at Baie St. Paul, it is present in large quantity. Whilst the Lower Laurentian strata occur throughout the district generally, the upper series has been recognized only in detached areas of comparatively limited extent. One of these is seen in the Counties of Argenteuil, Terrebonne, Montcalm, and Joliet, in the western part of the district; and others occur in the vicinity of the Montmorenci Falls; in the country about Baie St. Paul and Murray Bay; in the vicinity of Lake St. John on the Saguenay; and on the River Moisie, in the east. In addition to these crystalline formations, a few outlying patches of Silurian strata, consisting mostly of Trenton limestones and Utica shales, occur here and there within the Laurentide area. The largest of these Silurian outliers is seen around Lake St. John on the Upper Saguenay; and small exposures occur at one or two spots on the shore of the St. Lawrence, below Quebec, as at the Montmorenci Falls, Murray Bay, &c. Glacial boulders, clays, and gravels, with Post-Glacial sands and other superficial deposits—among which the titaniferous iron sands of the Lower St. Lawrence may be

especially mentioned—are distributed more or less generally throughout the region. The glacial striæ of the district run most commonly either towards the south-east or south-west; but in some few localities their direction is almost north-and south, and in others, not far removed from east-and-west.

(2.) *The Upper St. Lawrence District.*—This is essentially a Silurian area, occupied—apart from some isolated eruptive-masses—by sandstones, limestones, and other strata, which retain their original sedimentary aspect, and occur, for the greater part, in undisturbed beds. It extends along both sides of the St. Lawrence from the western boundary of the Province to the neighbourhood of Quebec. In the west, it includes the Counties of Vandreuil and Soulanges, lying in the point of the triangular space immediately west of the junction of the Ottawa and St. Lawrence Rivers. From the County of Vandreuil, its northern boundary crosses the Ottawa, and then, keeping entirely on the north side of the St. Lawrence, runs along the southern edge of the Laurentide district already described, and gradually approaching the river, strikes it a short distance below Quebec. Its southern limit runs from the south-west corner of Huntingdon (south of the St. Lawrence), along the boundary-line between the Province and the State of New York, to a little beyond the River Richelieu at the northern extremity of Lake Champlain; and east of this, the district is bounded by the disturbed and metamorphic area of the Eastern Townships—its actual limit in this direction being a remarkable line of dislocation, with accompanying fault, running (as first traced out by Sir William Logan) from near the north-west end of Lake Champlain to the vicinity of Point Lévis, and from thence around the City of Quebec, along the north side of the Island of Orleans, and down the river to near the mouth of the Magdalen, where it enters and runs along the Gaspé shore.

The rock-formations of the district belong to three distinct series. The stratified rocks, proper, consist of representatives of the Potsdam, Calciferous, Chazy, Black River and Trenton, Utica, and Hudson River (Lower-Silurian) formations—with some small exposures, south of the St. Lawrence, of strata referred to the Middle Silurian, Medina group, and a few outlying patches of Upper-Silurian strata (belonging to the Lower Helderberg formation) in the vicinity of Montreal. These formations are broken through in places by large eruptive-masses of trachytic and trappean rock, forming a series of picturesque

mountains, which rise abruptly from the generally level surface of the district in the more southern and western portions of its area; and in addition to these Silurian and eruptive rocks, Glacial and Post-Glacial accumulations, with deposits of comparatively modern origin, occur throughout the district generally.

The Potsdam beds consist of coarse conglomerates and fine-grained siliceous sandstones—the latter in many localities sufficiently pure for glass-manufacture and for the hearths of furnaces. The formation is largely displayed in Hemmingford Mountain, and over large portions of Huntingdon, Chateaugay, and Beauharnois, from whence it crosses the St. Lawrence, and spreads over a large part of Soulanges and Vandreuil; and from thence, passing across the western end of the Island of Montreal and Isle Bizard, it wraps around a large outlying mass of Laurentian gneiss (forming Mount Calvaire on the north shore), and continues uninterrupted along the edge of the Laurentide district as far east as the River Chicot, where the continuity of the strata is broken by a fault, and limestones of the Trenton formation are let down against the Potsdam beds. East of this point, the formation only appears at one or two places—notably on the St. Maurice, where it exhibits a slight thickness of nearly horizontal beds of conglomerate and sandstone, resting upon gneiss. Throughout its range, as far east as the Chicot, it is accompanied by sandy and dolomitic limestones of the Calciferous formation, and these cover large areas south of the St. Lawrence, and in the country around the junction of the St. Lawrence and Ottawa. East of this formation, on the south side of the St. Lawrence, limestones of the Chazy and Trenton series, and dark bituminous shales of the Utica formation, with succeeding sandstones and arenaceous shales of the Hudson River formation largely prevail—the latter, especially, east of Richelieu River. These formations cross the St. Lawrence, and range in regular sequence along the north shore between the Calciferous outcrop and the river bank. The intervening Island of Montreal, Isle Jésus, Isle Bizard, &c., consist essentially of Chazy, Trenton, and Utica strata—the Hudson River beds coming up farther east. The Chazy limestones of Caughnawaga and St. Doménique on the south shore, those of Ste. Genéviève on the Island of Montreal, of Isle Bizard, and of St. Lin on the north shore, yield marbles (red-spotted or uniformly red) of good quality. East of the River Chicot, which enters the St. Lawrence on the north shore, near the upper or western extremity of

the expansion known as Lake St. Peter, the comparatively narrow strip of country between the Laurentian gneissoid rocks and the river margin is occupied almost entirely by Trenton, Utica, and Hudson River strata—one or two small exposures of the Potsdam formation on the St. Maurice and at St. Ambroise alone representing the lower beds as seen west of the Chicot fault. In this eastern portion of the district, the strata are tilted in many places at considerable angles, as near Pointe aux Trembles, Montmorenci Falls, &c., and their continuity at these spots is more or less disturbed by minor faults.

As stated above, the Silurian strata of the more southern and western portions of the Upper St. Lawrence district are broken through in places by trachytic and trappean masses, forming a series of isolated mountains which rise above the generally level surface of the country to elevations of from 600 to 800 feet. Most of these occur apparently upon a single line of fissure traversing the district in a general south-easterly direction. They comprise: (1) the Mountain of Rigaud in Vandreuil, composed partly of a purely feldspathic, and partly of a dioritic or hornblendic trachyte, porphyritic in places; (2) the Montreal Mountain, composed essentially of angitic trap or dolerite, but traversed by dykes of compact and granitic trachyte; (3) Montarville or Boucherville Mountain, also essentially trappean in composition; (4) Belœil, a dioritic and micaceous trachyte; (5) Monnoir or Mount Johnson (south of Belœil), of the same mineral character; (6) Rougemont, in Rouville County, a trappean mass like that of Montreal in general composition; and (7), the Yamaska Mountain, essentially a micaceous trachyte. The Mountains of Brome and Shefford belong to the same eruptive series, but lie within the metamorphic district to the east. In addition to these principal masses, many dykes of similar character traverse the surrounding strata; and some of these in the neighbourhood of Montreal and Lachine are intercalated with the soft shales of the Utica series, which have become more or less worn away, leaving the associated trap bands in the form of projecting ledges. Most of the rapids in this part of the St. Lawrence have been thus produced.

The superficial deposits of the district comprise Glacial boulders and related clays and gravels, with Post-Glacial and recent accumulations. Drift or Glacial deposits, proper, are of general distribution; and in some places, as on the Rigaud Mountain, the boulders form

roughly parallel ridges of several feet in height. The Glacial striae of the country have two prevailing directions—south-west and south-east respectively. The Post-Glacial deposits belong chiefly to two series, as first determined by Dr. Dawson of Montreal, a lower deep-sea formation, known as the "Leda Clay;" and a succeeding deposit, apparently a shallow-sea or shore-line accumulation, known as "Saxicava Sand." These occur widely within the district, and at various elevations. On the Montreal Mountain, beds of Saxicava sand, for example, form a series of terraces, one of which is at an altitude of nearly 500 feet above the present sea-level. Beauport, below Quebec, is another locality at which these deposits are well exposed; but they occur also, and over large areas, around Murray Bay, as well as on the Lower St. Maurice, and elsewhere. The more recent formations of the district comprise, principally, the bog iron ores and ochres of the St. Maurice and other localities on the north shore of the St. Lawrence; the great peat-beds of Lanoraye, Lavaltrie, St. Sulpice, &c., on the same side of the river; and those of Sherrington, Longueuil, and St. Doménique, with others, on the south shore. Most of these peat beds overlies deposits of shell marl.

(3.) *The Appalachian District.*—The term "Appalachian region" was first bestowed on this part of Canada by Dr. Sterry Hunt. The district forms, indeed, a prolongation into Eastern Canada of the Appalachian region of the United States. The Appalachian chain, with its tilted, contorted, and in great part metamorphosed, system of rocks, being continued into the Orford, Sutton, and other mountains of the Eastern Townships, and from these into the Notre Dame and Schickschock ranges of the St. Lawrence and Gaspé. The district is essentially a Palæozoic area, but disturbed and altered over most of its extent by metamorphic agencies. It includes the section of country known as the Eastern Townships, and also the peninsula of Gaspé and intermediate country. It thus comprises all that portion of the Province which lies east of the line of dislocation and fault, referred to under the preceding district. This line of fault extends from the north-east extremity of Lake Champlain in a general north-easterly direction, to a short distance west of Point Lévis, from whence, crossing the St. Lawrence, it curves round the back of Quebec, runs along the Island of Orleans, down the bed of the river to near the mouth of the latter, and finally traverses the north coast of the extremity of Gaspé. The strata along the outer edge of this line of

fracture—in the Upper St. Lawrence district, described above—belong essentially to the Hudson River formation. They show (except on the Gaspé coast) no actual signs of disturbance; but on the east side of the line, an uplift has brought older strata (of the Calciferous or Quebec series) in seemingly conformable stratification against their flanks; and hence it has been conjectured, in explanation, that the Hudson River beds have been broken and partially reversed along the fault by this upward movement, the older strata overlapping them, and so following deceptively without any visible break in the sequence. The district is thus bounded (practically) by the River St. Lawrence on the north, and by the States of New York, Vermont, New Hampshire, and Maine, and the Province of New Brunswick, on the south. As regards physical features, it is more or less throughout of a mountainous character, but also, as a rule, of good fertility—differing altogether in this respect from the mountainous Laurentian region of the north shore. The average elevation of the Gaspé peninsula is about 1,500 feet, and that of the other portion of the district probably about 1,000 feet above the sea; but several peaks in the Schichshock ranges of Gaspé approach 4,000 feet in height, and the summits of some of the mountains in the Eastern Townships are apparently over 3,000 feet. Many lakes, but none of large size, occur within the latter portion of the district. Among these, Lake St. Francis lies at an elevation of 890 feet, and Lake Memphramagog at an elevation of 760 feet above the sea. In Gaspé, Lake Temiscouata and Lake Matapedia lie, respectively, at altitudes of 470 and 480 feet. The district abounds in rivers. Some of the principal comprise the Yamaska and St. Francis (as regards their upper courses), the Chaudière, with its tributaries, the Famine, Des Plantes, &c., and the Etchemin, in the more western portion of the district; and the Kamouraska, Rivière du Loup, Trois Pistoles, Rimouski, Métis, Matanne, Chatte, Ste. Anne, York, Cascapédia, Matapédia, and other rivers of the Gaspé peninsula, most of which flow in deeply excavated channels.

The rock formations of the district belong to three general groups: a series of Palæozoic strata, more or less altered in most localities; a series of eruptive, trachytic, and granitic rocks; and a series of Post-Cainozoic or superficial deposits.

The altered condition of many of the Palæozoic formations, and their disturbed condition generally, renders the determination of

their exact age somewhat doubtful; but they appear to consist of representatives of Lower and Upper Silurian, Devonian, and Lower Carboniferous, formations.

The Potsdam formation has been recognized at points on the St. Lawrence, between the Chaudière and the Trois Pistoles, in Temiscouata; and a strip of the Hudson River formation, represented by a series of contorted sandstones, dolomites, and bituminous shales, occurs along the coast of Gaspé, between the River M rsouin and Anse à la Tierce. The more important strata of the district, however, comprise representatives of the Quebec group (see below), with the overlying Gaspé limestones and sandstones (Upper Silurian and Devonian formations), and the Lower Carboniferous Bouaventure-formation of South Gaspé. The Quebec group of strata occupies, apparently, a position between the Calciferous and Chazy formations of other localities, or otherwise represents the two series combined. It is subdivided into three formations—comprising in ascending order:—

- (i.) The Lévis formation, made up principally of black graptolitic shales or slates, containing numerous graptolites and other fossils;
- (ii.) the Lauzun formation, consisting in part of red and green shales, sandstones, and dolomites, but composed mostly of metamorphic strata, among which talcose and other magnesian rocks (chloritic schists, serpentines, &c.) largely predominate—the lower and upper portions of the series containing many bands of copper ore and other metalliferous deposits; and
- (iii.), the Sillery formation, consisting chiefly of red and green shales, sandstones, and dolomites, but including, in places, altered rocks in the form of crystalline schists and epidotic and gneissoid strata.

The Lévis formation occurs prominently around the City of Quebec and Point Lévis, chiefly in the form of hard black shales dipping at high angles; but it is also seen around Richmond, on the St. Francis, and in the neighbouring townships, as well as around Phillipsburg, on the boundary line, and, again, east of the Chaudière. It is of much palæontological interest from the great number of graptolites obtained from its strata. The altered and metalliferous Lauzun division occurs more or less throughout the Eastern Townships, or between the north-east shore of Lake Champlain and the Chaudière River, generally. It is especially rich in copper ores; but contains, also, chromic iron ore, magnetic iron ore, specular iron schists, gold in quartz bands and veins, galena, serpentines and serpentine-marbles, roofing slates, and other economic sub-

stances. Its strata, as a rule, are much folded and disturbed, as well as altered chemically. The Sillery formation follows in most places the outcrop of the Lauzun beds, and the altered portions of its strata cannot always be sharply separated from the latter. In its unaltered state, it occurs, in the form of red and green shales, micaceous sandstones, and dolomitic beds, at Sillery Cove and Cape Rouge, near Quebec; and on the south shore, between the Chaudière and the vicinity of Point Lévis, and still more extensively in the country east of the Chaudière.

The "Gaspé-Limestone formation" is regarded as mainly equivalent in position to the Lower Helderberg series of western localities. Although composed chiefly of grey limestone strata, it is partly made up of a lower (perhaps Middle Silurian) series of black shales and slates; and some green and red shales are interstratified with its calcareous beds. The lower part of the formation occurs principally in the Eastern Townships of Orford, Melbourne, Westbury, &c., where it contains workable beds of slate, and is seen in places to overlie the Sillery formation unconformably; whilst the higher or more calcareous portion is chiefly developed in Gaspé. On the extreme eastern coast, as at Barry Cape, the Percé Rock, and elsewhere, the limestones present bold cliffs and pinnacles of rock, worn and hollowed by the action of the sea.

The "Gaspé-Sandstone formation," as shown by its fossils, is of Devonian age, representing most probably the Oriskany, Hamilton (or Lambton), and Chemung formations of western districts. It occurs in Dudswell, Burford, and other sections of the Eastern Townships, in the form of light or dark-coloured limestones or dolomites (rendered crystalline in places by metamorphism), which appear to merge more or less into the underlying "Gaspé-Limestone" beds. In Gaspé proper, where the formation occurs in its more typical aspect, it consists essentially of interstratified sandstones, shales, and conglomerates, holding in places many fossilized plant-remains. A thin seam of impure coal occurs also in these beds at Little Gaspé Cove; and petroleum springs ooze through the strata at Douglstown and elsewhere.

The "Bonaventure formation" represents the lower portion or base of the coal measures, but is entirely destitute of coal. Its strata are chiefly composed of conglomerates, with associated sandstones and red and greenish shales, some of which hold carbonized plant-remains;

and in many places they are penetrated by trap dykes. They rest unconformably on strata of the Gaspé-Sandstone series. The formation is seen principally on the eastern coast of Gaspé and on the opposite Island of Bonaventure, and still more prominently along the coast of the Bay of Chaleurs, where its average thickness was estimated by Sir William Logan, at no less than 3,000 feet.

The more important of the eruptive rocks occurring within the district, comprise:—(i.) The trachytic mountains of Brome and Shefford, agreeing in character with most of the eruptive mountains of the Upper St. Lawrence district, and belonging to the same linear series; (ii.) the granites of the Great and Little Megantic Mountains, and other granitic masses around Lake St. Francis, with those of Winslow, Hereford, Stanstead, Weedon, and other portions of the Eastern Townships' area; and (iii.), various trappean exposures of Eastern Gaspé and the Bay of Chaleurs. Most of these latter occur as interpenetrating and overlying dykes; but at some spots, trappean (or trachytic?) masses form mountains of high elevation, as seen in the "Conical Mountain" of the Cascapedia, and in others of similar character in the country between the Matapedia and the Restigouche.

The third series of formations referred to as occurring within the Appalachian district, consist of Post-Cainozoic deposits. These comprise:—(i.) Beds of auriferous gravel and magnetic sand; (ii.) boulder-clays, or drift deposits, proper; (iii.) beds of Leda clay and Saxicava sand; and (iv.) sundry superficial deposits of comparatively recent origin. The drift clays in many parts of the Eastern Townships and adjacent areas, are underlaid by (and also partially mixed with) layers of gravel and black magnetic sand containing, very generally, fine grains, and occasionally small nuggets, of free gold. These auriferous deposits have been recognized in the beds of most of the streams and rivers which flow through this section of the Province, and especially in the St. Francis, Chaudière, Famine, Rivière des Plantes, Etchemin, Gilbert, Metgermet, and Rivière du Loup. The Leda clay and Saxicava sand deposits are largely displayed on the Trois Pistoles, Cacouna, Rivière du Loup, Ste. Anne, Matanne, Métis, and other rivers. On the Métis (in Gaspé) a bed of Saxicava sand occurs at an elevation of 245 feet above the present sea level. The more superficial deposits of the district include the bog iron ores of Stanbridge, Farnham, Simpson, Ascot, Stanstead, Ireland, St.

Lambert, St. Vallier, Vallery, Cacouna, and other sites; the ochres of Durham; the shell-marls of Stanstead, New Carlisle, &c.; and the peat beds of the Rivière Ouelle, Rivière du Loup, Métis, Rimouski, and Madawaska.

(4.) *The Anticosti District.*—This division includes the large Island of Anticosti, in the St. Lawrence Gulf; the group of the Mingan Islands on the opposite northern shore; and a narrow strip of the latter lying around the mouth of the Mingan River, and extending eastward for several miles. It should also include, strictly, the strip of land along the Gaspé Coast, lying north of the line of dislocation described under the preceding division. It is essentially a region of unaltered and comparatively undisturbed Silurian strata. The Island of Anticosti extends in a general north-west and south-east direction, with a length of about 150 miles, and a breadth, in its broadest part, of about 35 miles, gradually tapering at the extremities. The northern coast presents bold ranges of cliffs, from 200 to 400 feet in height, cut through in places by deep water-courses. The interior of the island is thickly wooded, but is destitute of lakes and important streams. It appears to consist of a series of plateaux or broad terraces, gradually descending to the south shore. The latter, although showing in places high cliffs of drift clay, is mostly of a low and swampy character, and this part of the island is especially characterized by the presence of extensive beds of peat.

The Mingan Coast consists of arenaceous limestones and dolomites of the Calciferous formation, and similar strata on the islands are succeeded by Chazy beds composed of reddish and pale-grey limestones, with interstratified arenaceous shales. On the principal island (Large Island) of the Mingan group, light-coloured limestones, holding characteristic Lower Trenton or Black-River fossils, overlie the Chazy beds—the whole dipping, at a slight angle, southwards or towards the Gulf. The next exposure (in the regular sequence of Lower Silurian formations) occurs along the opposite north coast of Anticosti, and consists of greyish and other coloured limestones, with interstratified shales and conglomerates, having an inland or southerly dip of very slight amount. These beds belong to the upper part of the Hudson River formation, and it may thus be legitimately inferred that the intervening area of the Gulf is occupied uninterruptedly by other Hudson River beds, with Utica and Trenton strata cropping out successively from beneath them. In some of these

Hudson River strata, examples of the curious stem-like corals (*Beatricea undata*), resembling the petrified trunks of large trees, occur in considerable abundance. The succeeding area of the Island to the south, is occupied by argillaceous and other limestones, essentially of Middle Silurian age, the equivalents apparently of the Medina, Clinton, and Niagara formations of the West; but characteristic Niagara fossils are associated in some of these strata with Hudson River and other Lower Silurian types.

The other rock-formations of the district consist of Post-Cainozoic deposits. Raised beaches, in the form of a series of terraces, extending to a height of about 100 feet above the sea, occur on some of the Mingan Islands; and other evidences of elevation are seen in the pillared rocks left here and there upon the surface, at heights of fifty or sixty feet above the present sea-level. Drift clays, holding limestone pebbles, overlie the calcareous strata of some parts of Anticosti, especially on the southwest coast, where they form cliffs of considerable height. But the more remarkable of the Post-Cainozoic formations of Anticosti are the great peat-beds, which cover large areas on the southern part of the Island. One of these extends in a narrow band along the south-east coast, between Heath Point and South Point, over a length of nearly eighty miles.

PROVINCE OF NEW BRUNSWICK.

The geology of New Brunswick, notwithstanding the numerous reports already published upon it, still remains, in a great measure, to be worked out. Viewed, however, in its broader or more general features, the Province may be looked upon as including two essentially distinct geological regions. These comprise: (1) the Western and Southern district, occupied for the greater part by granitic, and more or less altered rocks—the latter mostly of Pre-Silurian and Silurian age—with a few limited exposures of higher strata; and (2) the Eastern or Carboniferous district, occupied exclusively, or practically so, by subdivisions of the Carboniferous formation. If a line be drawn from near Bathurst, on Nipisiguit Bay (an inlet of the Bay of Chaleurs), to Lake Oromocto, in the south-east corner of York County, and another from this point, in an easterly or north-easterly direction (roughly parallel with the Bay of Fundy), to Chepody Bay, in Albert County, the two districts will be marked out with sufficient accuracy for general purposes. All the country west and south of these lines

will belong to the first district; and the great triangular area extending east and north of the lines to the Gulf shore, will form the second or Carboniferous district.

(1.) *The Western and Southern District.*—The geological structure of this region is of a very complicated character. Most of its strata are in an altered or metamorphic condition, and are more or less broken up, contorted, and intermixed; whilst faultings and overturn dips are of frequent occurrence amongst them, thus adding, in many cases, to the general obscurity of their age. In the present state of our knowledge, the district is most conveniently described under two subdivisions, as below:

(i) *The Western Division.*—This may be assumed to include the country lying west of the line described above as running from Nipisiguit Bay to Lake Oromocto. It thus includes the Counties of Ristigouche, Victoria, and Carleton, with the chief part of York, and the north-west portion of Northumberland. Its surface consists very generally of extended plains, cut by numerous river-valleys, and heavily wooded throughout. The average elevation above the sea is, probably, under 500 feet, but isolated mountains in its more northern limits attain to elevations of from 1,500 to over 2,000 feet. The principal rivers comprise the head-waters and upper course of the St. John, with its numerous tributaries, including the Tobique, the Beccaguimic, &c.; and the upper portions of the Miramichi, Nipisiguit, and Ristigouche. The rock-formations within it consist principally of a series of micaceous and other slates, with quartzose and argillo-calcareous strata, dipping at high angles and greatly contorted in places; whilst over a broad tract of country, extending from Grand Lake on the Province boundary-line, in a general north-easterly direction to the vicinity of the Bay of Chaleurs, they are associated with long belts of granitic rock. The slates, quartzites, and other altered strata, are regarded mainly as Upper Silurian formations, from a few characteristic fossils discovered in some of their beds, but older formations (as seen in the Southern Division of the District) may perhaps occur among them. The granites are probably in chief part, if not wholly, of Devonian age. Copperpyrites, and beds of slaty hematite, occur in these altered strata in the neighbourhood of Woodstock; and veins of antimony ore in the Parish of Prince William, between Woodstock and Fredericton. The only other formations—apart from superficial deposits—recognized within this

western section, consist of sandstones, shales, and conglomerates, with subordinate beds of limestone and gypsum, of Lower Carboniferous age. These occur as outlying portions of the great carboniferous district of the east. The most important of these outliers, none of which, however, contain any coal, occupies a comparatively large area on the Tobique River; and a smaller one lies on the St. John, between Fredericton and Woodstock.

(ii.) *The Southern Division.*—This geological area, although forming properly a portion of the Western Division described above presents certain points of difference in the apparently more complete series of rock-formations contained within it, and in the still greater signs of disturbance to which the older of these formations have been subjected. It comprises the region lying immediately along the north shore of the Bay of Fundy, and extends over the entire areas of Charlotte and St. John Counties, over part of Queen's County, and over large portions of the counties of King and Albert. The rock-formations recognized within its limits are as follows:

First, a series of gneissoid strata, with succeeding dioritic and chloritic slates, quartzites, and related metamorphic beds, associated very generally with high belts of granitic and syenitic rock, and for the greater part, in a much disturbed condition. These crystalline and semi-crystalline strata are Pre-Silurian formations, and are regarded as of Laurentian and Huronian age; but the associated granites and syenites are probably Devonian. Elevated areas of this character occupy large portions of Charlotte and St. John Counties, and others occur in Queen's, King's, and Albert County—as seen in the Nerepis Hills, the Porcupine and Bald Mountain Ridges, the Quaco Hills, and elsewhere. Many of these granites and syenites are porphyritic; and some of them, especially the red varieties, furnish ornamental building-stones of much beauty.

A second series, composed of dark slates associated with beds of sandstone, forming a collection of strata known as the St. John's Group or Formation. These strata overlie crystalline beds of the supposed Huronian series; and they contain examples of Paradoxides, Conocephalites, and other trilobites of so-called "Primordial" type, with brachiopods, &c., characteristic of the same geological horizon. They are thus regarded as forming the extreme base of the Silurian series—including under this term the Cambrian strata of many geologists. As a rule, they are greatly folded and contorted, and

they appear to be destitute of economic minerals. Outcrops occur, more especially, within and around the City of St. John, and in the valleys of the St. John, Kennebecasis, and Nerepis Rivers.

A third series, consisting mostly of grey shales and limestones, and siliceous conglomerates, with associated feldspathic and dioritic beds, containing in places some obscure fossils of Middle and Upper Silurian type. These higher Silurian strata occur chiefly on Foye's Island and the adjacent coast, on the shores of Oak Bay, &c., and along the granitic slopes of the Nerepis Hills in King's and Queen's Counties.

A fourth and higher series, composed of Devonian and Lower Carboniferous strata, represented essentially by shales, sandstones, and conglomerates, and characterized for the greater part by the presence of numerous fossil plants. The Devonian beds have been divided into five groups, known, in ascending order, as the Bloomsbury, Dadoxylon, Cordaite, Mispec, and Perry groups—the latter regarded as Upper Devonian. The lower and middle groups are principally developed around Carleton and other points on the west side of St. John's Harbour; at Mount Prospect and elsewhere in the valley of Little River; and also in Lancaster Parish and around Leprean Basin, where a thin seam of slaty anthracite has been observed in one of their beds. The Upper Devonian or Perry strata also appear at Point Leprean, but are chiefly exposed around the City of St. Andrews, where they extend over a comparatively large area. The beds recognized as Lower Carboniferous are entirely destitute of coal, and in this southern part of the province they occur only in the form of detached outliers, of comparatively small extent—as on the west side of Grand Bay on the River St. John, the south side of Kennebecasis Bay, and around Quaco, on the Bay of Fundy.

A fifth series, composed of a few strips and patches of Triassic strata, essentially in the form of soft, red sandstones, but associated in places with a few layers of conglomerate. These strata occur sparingly near Quaco Village and elsewhere on the Bay of Fundy, and also on the north shore of the Island of Grand Manan, where the characteristic red sandstone of the series is overlaid by a light-grey siliceous bed holding copper ore, with an immense overflow of columnar trap covering the whole.

Finally, accumulations of boulder clay and gravel, with sands and other recent surface-deposits, are spread very generally over this

southern portion of the district, which appears, moreover, to have been largely denuded and otherwise affected by glacial agencies. The more important of the recent formations are the peat bogs of the Mispec Barrrens and Musquash Bay, in St. John's County, and those of Mace's Bay and other localities in Charlotte County, further west.

(2.) *The Eastern or Carboniferous District.*—This geological region occupies the central and eastern portions of New Brunswick, forming a large triangular area, the sides of which converge, respectively, from Nipisiguit Bay, on the Bay of Chaleurs, and Salisbury Cove, on Chignecto Bay, to a point in the vicinity of Oromoctoo Lake, near the boundary-line of York and Charlotte Counties. It presents, as a rule, a flat or gently undulating surface, drained principally by the Miramichi and branches, in its more northern and central portions; and by the St. John, with the Nashwauk, Salmon, Washademoxe, and other tributaries of the St. John, in the south. Its average height above the sea is probably about 400 feet. Its strata consist essentially of sandstones, calcareous and other conglomerates, and argillaceous shales; and they belong to the lower, middle, and upper subdivisions of the Carboniferous series. Seams of coal are confined entirely to the middle division—as elsewhere in the Carboniferous formations of the Maritime Provinces—but those hitherto discovered in New Brunswick are of comparatively slight thickness, the most important seam scarcely exceeding a couple of feet, whilst the greater number present a thickness of a few inches only.

The Lower Carboniferous division is made up principally of sandstones, shales, and conglomerates, characterized by a very generally prevailing red colour. Apart from outliers, it is confined, practically, to the inner edge of the metamorphic area which borders the present district on the east and south; and its strata in many places are folded among the metamorphic formations, and are also more or less broken up by faults, or are otherwise disturbed, as below Long Island, on the River St. John, and elsewhere. Coal, except in unimportant traces, is apparently altogether absent. In some localities, however, and notably in the Parish of Hillsborough, in Albert County, the remarkable bituminous substance known as "Albertite" occurs in these Lower Carboniferous strata, in the form of undoubted veins. This substance is a kind of solid bitumen—black, brittle, and highly lustrous. At the Hillsborough mines, it traverses—and for the greater

part at a high angle of dip—calcareo-bituminous shales containing remains of fossil fishes (belonging to *Palæoniscus*, *Holoptychius*, and other genera), with overlying grey and red conglomerates, intercalated with beds of limestone and gypsum. At other localities, as at Markhamville, in Upham Parish, King's County, and near Shepody Mountain, in Albert County, the Lower Carboniferous strata contain important deposits of pyrolusite or black manganese ore. Finally, at Clarke's and McLeod's Mountains, north of Frederickton, and at Bald Mountain, near Cranberry Lake, and some other spots, the strata of this lower division are broken through by eruptive masses of trap-pean or trachytic rock.

The Middle Carboniferous strata consist essentially of sandstones, sandy shales, and conglomerates, of a prevailing gray colour. The series may be subdivided into two groups: a lower group, made up of rocks of a more or less coarse texture, destitute of coal—the equivalent of the millstone grit subdivision of Nova Scotia; and a higher group of conglomerates and sandstones of finer texture, intercalated with coal shales, layers or partings of clay, and thin seams of bituminous coal, representing the productive portion of the coal measures proper. The strata of both groups occur, as a rule, in nearly horizontal beds, or dip only at very moderate angles, rarely exceeding four or five degrees. Most of the coal seams hitherto discovered are under five or six inches in thickness, but one seam, known as the "surface seam," averages eighteen or twenty inches, and, in places, exceeds a couple of feet. It has been worked somewhat extensively as a source of local supply. These Middle Carboniferous beds appear to extend over the entire portion of Eastern New Brunswick, between the Gulf on the east, and the border of Lower Carboniferous and Metamorphic rocks on the south and west; but in some places the lower rocks have been exposed, by denudation, over limited areas; and at other spots, the beds in question have been covered by red and purplish shales, &c., of the Upper Carboniferous series.

The strata of the Upper, like those of the Lower, Division, are essentially composed of shales, sandstones, &c., for the greater part of a red or reddish purple colour, and destitute of coal. They overlie the Middle Series conformably, and appear to be associated more or less generally with the latter throughout the greater portion of the district.

PROVINCE OF NOVA SCOTIA.

This Province, as regards its more salient geological features, is divisible into two broad regions, comprising: (1.) The Southern Metamorphic District, occupied essentially by crystalline and granitic formations; and (2.) the Northern Carboniferous District, in which a number of Palæozoic, and for the greater part Carboniferous, areas, are separated more or less by belts and mountain ranges of syenites and other related crystalline rocks.

(1.) *The Southern Metamorphic District.*—This forms a long but comparatively narrow area, extending over the country along the entire southern coast of Nova Scotia proper, from a point between Yarmouth and Cape Sable, in the west, to Cape Canso and the south shore of Chedabucto Bay, in the east. Gradually contracting in width between these points, it includes small portions of Digby and Annapolis Counties, the whole of Shelbourne, and large portions of Yarmouth, Queen's, Lunenburg, Halifax, Hants, and Guysboro'. Its coast-line is deeply indented, and its interior, for the greater part, of a wild and rocky character. As regards its geology, it is essentially a metamorphic region, occupied by crystalline strata, with considerable areas of unstratified granitic rocks, the latter, apparently, of Post-Silurian age.

The crystalline strata appear to consist in part of Laurentian formations, and in part of altered higher beds, ranging into the Silurian series. They are composed mostly of gneiss, fine-grained in some localities and porphyritic in others, with associated mica-slates and quartzites, succeeded in many places by black or bluish-black argillites with well-marked slaty cleavage. These strata, as a rule, occur in highly-tilted or otherwise disturbed beds. Thin layers (or bedded veins!) of quartz, for the greater part auriferous, are present, more especially, in the middle and upper portions of this metamorphic series. The gold is mostly distributed through special zones or so-called "streaks," or "pipes," in these quartz deposits, and it occurs chiefly in the free state. In some places, however, it is also present in arsenical and common pyrites.* These quartz layers, as a rule, are under a foot in width. They are very commonly situated on anticlinals, with high angle of dip; and in many cases they are sharply

* Streaks or pipe-bands of this character are not uncommon in ordinary mineral veins. As regards Western Canada, the writer has pointed out their occurrence in certain lead veins in the township of Galway, in Ontario.

corrugated—the enclosing rock presenting, necessarily, a correspondingly convoluted structure. The more important localities, or “districts,” in which these gold deposits have been recognized, are as follows:—(i.) The *Lunenburg* district, including the *Ovens* area, &c.; (ii.) the *Waverley*, *Oldham*, and *Renfrew* district, north of Halifax; (iii.) the *Uniacke* district; (iv.) the *Tanjier* district; and (v.) the *Sherbrooke* and *Stormont* district, including *Wine Harbour*, *Country Harbour*, &c.

The granite areas lying within this southern metamorphic region have not yet been thoroughly explored, so that eventually many apparently isolated masses will probably be found to constitute connected bands. Those at present recognized occupy the following sites: The country around *Barrington* and *Shelburne*, north and north-east of *Cape Sable*; the more southern portions of *Digby*, *Annapolis*, and *King's* counties; the *Aspatagoen* promontory between *Mahone Bay* and *Margaret Bay*; the country around *Halifax*, especially north and west of the city; the lower portion of the *Musquodoboit* valley, and adjacent country to the east; the south shore of *Chedabucto Bay* and the country westward to the vicinity of *St. Mary's River*.

(2.) *The Northern Carboniferous District*.*—This region extends along the *Bay of Fundy*, and throughout all the northern, central, and eastern portions of *Nova Scotia*, including the *Island of Cape Breton*.

In its general features it presents a number of detached *Silurian* (and *Devonian*?) areas, separated for the greater part by ridges and mountainous masses of *syenites*, and surrounded by areas of *Carboniferous* strata. The *Silurian* and *Devonian* rocks are mostly tilted at high angles, and are altered more or less by *metamorphic* action. The surrounding *Carboniferous* strata belong partly to the *Lower* division, but chiefly to the *Middle* or *Productive* portions of the series, and in many localities they contain important beds of *bituminous coal*, some of the seams being of unusual thickness. In addition to these strata, some comparatively narrow strips of *Triassic* sandstone, associated with vast *trappean* overflows, range along the *Bay of Fundy* and the shores (in part) of *Cobequid Bay*. *Boulder clays* and *Post-Glacial* deposits are distributed also throughout the region generally.

* The names given to these districts must not be taken in too limited a sense. The present region is named as above, because it is especially characterized, when viewed generally, by the presence of *carboniferous* strata.

Although regarded in the present outline as forming a single geological district, characterized as above, this northern portion of the Province may be provisionally subdivided, for descriptive purposes, into twelve subordinate areas. These follow each other, roughly, from west to east in the following order:—1. The Annapolis and North Mountains area, mostly Triassic and Trappean; 2. The Newport and Truro area, essentially Lower Carboniferous and Triassic; 3. The Cobequid Mountains area, essentially syenitic and slaty; 4. The Cumberland area, Middle Carboniferous (coal-bearing); 5. The Pictou area, Middle Carboniferous (coal-bearing); 6. The Egerton, Arisaig, and Poreupine Mountains area, essentially syenitic and slaty; 7. The Antigonish area, essentially Lower Carboniferous; 8. The Guysboro' area, Lower Carboniferous; 9. The Southern area of Cape Breton, essentially syenitic and slaty; 10. The Western Cape Breton area, mostly Lower Carboniferous, with some overlying coal-bearing beds; 11. The Sydney Cape Breton area, Middle Carboniferous (coal-bearing); 12. The Northern area of Cape Breton, syenitic and slaty.

1. *The Annapolis and North Mountains Area.*—This division extends along the south shore of the Bay of Fundy. It includes the North Mountains and the valleys of the Cornwallis and Annapolis Rivers, and is limited inland by the granitic slopes of the South Mountains. The strata which rest against the latter, consist essentially of altered and partially-altered slates of Upper Silurian or Devonian age. They dip away from the granite mass, and they are traversed generally by transverse cleavage-lines. Towards the north, as in Kentville and New Canaan, they are but little altered, and numerous crinoid stems and other apparently Upper Silurian fossils occur in their beds at these sites. A thick bed of granular iron ore on the River Nictau, farther south, also contains fossils. A few miles south of this stream, the continuity of the strata is interrupted by a granite spur, but beyond this, the slates reappear, although in a more altered condition, and extend broadly to the sea-coast, south of St. Mary's Bay. North of this granite spur, or along the valleys of the Annapolis and Cornwallis, the slates are bordered by a narrow strip of red sandstone country, apparently Triassic. The sandstone is mostly in the form of thin and slightly-inclined layers. These rest in places on highly-inclined strata of the Carboniferous series, but the latter are of quite subordinate occurrence in this area. Immediately west of the Triassic country, a broad belt of columnar and

amygdaloidal trap ranges continuously, in the form of a bold line of cliffs, along the shore of the Bay of Fundy from Bryer's Island to Cape Blomidon, with outlying patches in Partridge Island, &c., and at Cape d'Or on the opposite coast. A layer of tufaceous material marked by green cupreous stains, arising from the decomposition of imbedded bunches of copper-glance, occurs very generally between the sandstone and the overlying trap. Zeolites and other characteristic trap minerals are abundant in the latter at many spots.

2. *The Newport and Truro Area.*—This subdivision occupies the country around Minas Basin and Cobequid Bay, extending northwards to the Cobequid mountain range, southwards to the northern edge of the Atlantic metamorphic region, and eastward to the slopes of the syenitic ranges in the south-east of Colchester County. It thus includes the country around Windsor, Newport, Walton, Maitland, Truro, and Parrsborough, with the valleys of the Kennetcook, Shubenacadie, Stewiacke, and Musquodoboit rivers, more especially. Its strata belong, for the greater part, to the Lower Carboniferous series, and consist of red and other-coloured sandstones, dark shales holding numerous coal-plants and fish remains, marls, and limestones. The latter strata contain an abundance of Carboniferous brachiopods and other fossils; and in many places, as in the vicinity of Windsor, in the cliffs of the St. Croix River, at Newport and Walton, along the Shubenacadie, &c., they are associated with beds (and occasional veins) of anhydrite and gypsum. A few comparatively limited patches of Middle Carboniferous strata overlie these lower beds here and there along the edge of the Cobequid Range, and in places in the valleys of Kennetcook and Stewiacke, but they appear to contain merely thin seams of coal, of value only as a source of local supply. Both the north and south shores also of Cobequid Bay are bordered by soft red sandstones and conglomerates of assumed Triassic age. These rest unconformably on the prevailing Lower Carboniferous formations of the country; and in places, as at Gerrish's Mountain and elsewhere, they are overlaid by masses of amygdaloidal trap.

3. *The Cobequid Mountains Area.*—This section of the Province forms a wild but thickly-wooded mountainous district, of an average elevation of from 1,000 to 1,200 feet above the sea. It ranges, roughly, from Cape Chignecto in the west, to the Carboniferous district of Pictou in the east. Southwards it is bounded by the Newport and Truro area, and northwards by the Cumberland coal region. The Cobequid range is composed essentially of syenites and related

crystalline rocks, probably of Pre-Silurian age, with slates, shales, sandstones, and quartzites, dipping at high angles on its southern flanks. These latter formations are regarded as altered Silurian strata. In the township of Londonderry (Colchester county), more especially, they are traversed by veins of brown and red iron ore and ankerite.* One of these is remarkable for its continuity over a length of several miles. It is filled principally with ankerite, but carries large quantities of fibrous and botryoidal brown iron ore in some places, and micaceous red ore in others. The ankerite averages in metallic iron $11\frac{3}{4}\%$, the brown ore 56% , and the red ore nearly 69% , as deduced from a series of analyses by the writer. These ores, moreover, contain very little rock matter, and they are practically free from titanium; whilst sulphur and phosphorus are present in them in traces only.

4. *The Cumberland Area.*—This is one of the leading Carboniferous districts of the Province. It occupies in the County of Cumberland a large extent of country between the Cobequid Mountain Range on the south, and the Straits of Northumberland on the north. Westward it runs into the Carboniferous area of New Brunswick; and in the east it merges into the Pictou area. Its strata consist of the Lower and Middle (or Productive) Carboniferous divisions. The latter hold numerous seams of coal, but most of these are of slight thickness. Workable seams occur, however, within the area, more especially in the Springhill coal basin, near the slopes of the Cobequid Range. The strata here dip northwards, or away from the mountain flanks; but in the central and northern, or north-western, portion of the area, they dip towards the south, thus forming a more or less regular trough or basin. On a portion of the northern edge of this trough (the strata dipping nearly S.S.W.), the celebrated "South Joggins section" occurs. This is exposed along the eastern shore of Cumberland Basin, a continuation of Chegnecto Bay. It exhibits a continuous series of Lower and Middle Carboniferous beds, dipping S. 25° W., at an average angle of 19° , throughout a thickness of 14,500 feet, and containing seventy-six seams of coal, nearly all of which rest upon stigmara under-clays. These coal seams for the greater part, however, average, individually, only a few inches in thickness; but two are of workable dimensions. One of these is the "Joggin's Main Seam," consisting, really, of two seams separated by a thin layer of

* See Dawson's *Acadian Geology*. Also a detailed notice, with working plan, by Mr. Selwyn, Director of the Geol. Survey, in the Report for 1872.

shale, but worked as a single seam. It averages nearly five feet in thickness. In the associated sandstones and shales, upright and prostrate trunks of sigillariæ and lepidodendra—with other coal plants, shells of fresh water mollusca, and numerous fish scales—occur throughout the section. In these rocks, also, the remains of an extinct amphibian—the *Dendrerpeton Acadianum* of Owen and Wyman—belonging, apparently, to the perrenibranchiate section of the Urodela—were discovered by Dr. Dawson, in 1852; and reptilian tracks have been discovered subsequently. Some of the lower beds of this locality yield grindstones of high reputation. On the southern margin of this area, where the general dip of the strata is towards the north, seams of greater thickness have been recognized. These lie east of the River Macan, in the Springhill coal country. Several seams of workable thickness have been discovered by trial pits. One exceeds 13 feet, and another 11 feet in thickness, the others ranging from 2 to 6 feet. The coal is a bituminous or gas coal, of excellent quality.

5. *The Pictou Area.*—This is the most important coal area of Nova Scotia proper. It lies directly east of the Cumberland Carboniferous district and the Cobequid mountain range, and thus comprises the country around Pictou Harbour, generally. It extends, however, southwards and eastwards to the older Palæozoic and Syenitic mountainous country, which ranges from the eastern borders of the Truro area through Egerton and Maxwelltown, and continues to the north coast in the Antigonish and Arisaig Hills. On these southern and eastern borders the area is occupied generally by various conglomerates, dark green and other-coloured slates and shales (many of which become opaque white by weathering), and some dark quartzites—all Pre-Carboniferous, but otherwise of doubtful age; and these are followed towards the north or north-west by grey and red sandstones and conglomerates, with a few limestone and gypsum beds, belonging to the Lower Carboniferous series. These lower formations are more or less tilted and disturbed, and they exhibit nearly opposite dips in different localities. The central and northern portions of the area are occupied by succeeding strata of the Middle or Productive series, with overlying beds of the Upper series in places along the coast. The general dip of these strata is northwards—i. e., a little west or east of north—or towards Northumberland straits; but they are affected, over the more southern portion

of their limits more especially, by a series of faults, by which their relative positions are somewhat disturbed. The base of the Middle Division is a coarse red conglomerate, which outcrops immediately north of one of these lines of fault, and runs in a general easterly direction through New Glasgow, between the inlets or harbours of Pictou and Merrigomish. This dips generally towards the north, in which direction it is followed by the more typical coal strata (although these present little more than indications of workable coal seams), with strata of the Upper Division outcropping beyond them and so passing under the straits. South of the New Glasgow conglomerate and fault—the outcrop of the conglomerate being due to the latter—other beds of the Middle or Productive Division occur; and it is in these that the great workable coal seams of the Pictou area are situated. They are traversed by several faults running roughly east and west, or parallel with the northern or New Glasgow fault; and they are also partially disturbed by minor faultings, running more or less transversely to the latter. The coal seams lie principally in two main synclinals between the north and the extreme south fault—a breadth or distance of from three to four miles intervening between these. Two of the seams are of remarkable thickness. These are exposed principally on and near the East River in the district of the Albion and Acadia mines, a few miles south-east of Pictou Harbour. One seam, known as the “Main Coal Seam,” has an average thickness of about 36 feet; and a second seam, the “Deep” or “Cage-Pit” seam, lying 150 feet vertically beneath the main seam, is about 23 feet in thickness. These seams do not consist throughout of coal of uniform quality, but include subordinate layers of coarse coal and slaty coal, and also some thin seams of ironstone; the whole, however, being taken out together, and thus worked as a single bed. At the Albion mines the dip of the main seam is N.E., at an angle of 18° – 23° , and the thickness varies from 36 ft. 10 in. to 28 ft. 3 in. Several seams have been discovered below the Deep or Cage-Pit seam, varying in thickness from 3 feet to about 12 feet; and a $3\frac{1}{2}$ feet seam occurs also above the Main seam. Other seams have likewise been recognized by outcrops at Fraser’s Mountain, and on Middle River, &c., within the present area. One of the lower seams, lying at a vertical depth of 580 feet below the Deep seam, consists of a layer or “bench” of ordinary bituminous coal, about 3 feet in thickness, resting on a layer of inflammable substance, somewhat

resembling in character the Albertite of New Brunswick, and the Torbanite of Scotland. This substance has been named "Stellarite," by Professor How, from its property of emitting numerous sparks during combustion. It varies in the thickness of its bed, from five or six inches to about a couple of feet. Immediately beneath it there is another layer of a bituminous, or so-called "oil," shale, differing principally from the stellarite layer by its more shaly structure, and by the presence of a comparatively large amount of ash. The stellarite yields on an average about 120 gallons of crude oil per ton, and the oil shale about 60 gallons. In a band of impure ironstone, forming part of the Albion main seam, the skull and several teeth of a large Labyrinthodont—the *Baphetes planiceps* of Owen, were discovered some years ago by Dr. Dawson.

6. *The Egerton, Arisaig, and Porcupine Mountains Area.*—This area might be regarded as an eastern extension of the Cobequid Mountains, although separated from the latter by a narrow strip of Carboniferous country connecting the Truro and Pictou areas. Like the Cobequid Mountain area, it consists of high rocky land, made up of central ranges of syenitic rocks with altered Silurian (and Devonian?) strata, in the form of highly-tilted slates and quartzites, upon their flanks. It extends in a general north-easterly direction from near the head-waters of the Shubenacadie to within a few miles of Antigonish Harbour, where it subdivides into two branches, one of which terminates in the Arisaig Hills and in Cape St. George, and the other in the Porcupine Mountains on the Gut of Canseau. Some of the slates of this area, as those of Arisaig and other localities, contain Middle Silurian (?) fossils. The Antigonish Hills and Cape St. George in the north-east, and Cape Porcupine on the Gut of Canseau are composed, at least in their central portions, of vast masses of syenite and greenstone (probably of Pre-Silurian age) flanked by dark slates in highly-tilted and more or less contorted beds.

7. *The Antigonish Area.*—This extends over the greater portion of Sydney County, in Nova Scotia proper. It lies chiefly around Antigonish Harbour and the south shore of St. George's Bay, and thus includes the valleys of West River, South River, Ponket River, Black River, the Tracadie River, &c., and intervening breadths of country—the syenitic and altered rocks of Arisaig and Cape Porcupine bounding it, respectively, on the west and south. It is occupied essentially by strata of the Lower Carboniferous series, consisting of

sandstones, limestones, &c., with thick and widely-extended beds of pink and white gypsum. A slight development of the Middle Carboniferous series occurs in the more northern portion of the area, between the Pomket and Tracadie rivers, and extends under St. George's Bay; but only a few thin seams of coal appear to be present in its strata.

8. *The Guysboro' Area.*—This area lies around the north-west shore of Chedabuctoo Bay, and extends westward, in a gradually narrowing belt from the south entrance of the Gut of Canseau, entirely across the county of Guysboro' and along the valley of the west branch of the St. Mary's River. It is bounded on the south by the eastern extension of the Atlantic crystalline area, and northwards by the southern slopes of the Cape Porcupine and Egerton syenitic and metamorphic region. Its strata appear to belong entirely to the Lower Carboniferous division, and they are destitute of coal. They consist, in the more eastern portion of the area, very largely of dark and other limestones, traversed here and there by thin veins or strings of specular iron ore, and accompanied by various sandstones and conglomerates, the latter occupying the chief portion of the area westward. In many places, especially around the town of Guysboro', these Lower Carboniferous strata dip at high angles, and present a more or less altered aspect.

9. *The Southern Area of Cape Breton.*—This area ranges from Isle Madame across St. Peter's Bay, and along the entire south coast of Cape Breton. It may be defined in general terms as occupying all the more southern portion of the Island, or those portions of the counties of Richmond and Cape Breton which lie to the south and south-east of the Great Bras d'Or and the Mire River. Its geology to some extent has still to be worked out, but the area is occupied essentially by masses of porphyritic syenite and related rocks, associated with slates and other apparently altered strata, for the greater part of Palæozoic age, but including, probably, a few subordinate representatives of Pre-Silurian epochs.

10. *The Western Area of Cape Breton.*—This division lies immediately east of the Strait or Gut of Canseau. It extends from St. Peter's Bay over the western half of Richmond county, and northwards over the Bras d'Or Lake or Great Bras d'Or, and over the more western portion of the Little Bras d'Or. From these points it stretches to St. George's Bay and along the Gulf to beyond the Mar-

garie River. It thus includes the greater portion of Richmond county, with the more western portion of the county of Cape Breton, and the southern portions of Inverness and Victoria. The rocks within this section of country belong chiefly to the Lower Carboniferous series, but the area includes also some slight exposures of the Middle or Productive series, and several tracts of considerable size occupied by syenites and related rocks. The Lower Carboniferous strata consist of various beds of conglomerate, sandstone, limestone, and marl—the two latter associated in many places (as at Plaister Cove, Port Hood, and Mabou, on the Gut of Canseau; at Caribou Cove on the south coast; and at Baddeck and other points on the Little Bras d'Or) with beds and occasional veins of gypsum and anhydrite. These lower strata are succeeded here and there by small patches of the Middle Carboniferous series, containing seams of coal. These occur at Caribou Cove and on Little River (where the beds are much tilted and disturbed), and also on the Inhabitants River, in the south; and near Port Hood and Mabou in the north-west. The coal bed at Caribou Cove, as described by Dr. Dawson, is 11 feet 8 inches in thickness, but of inferior quality; and it shows an overturn dip with the original underclay now forming its roof. At Port Hood several seams have been recognized, but these, apparently, are of no great thickness. The strata at this latter locality contain numerous *stigmaria*-roots in undisturbed position, together with other characteristic coal plants. In addition to these Carboniferous strata, this western portion of Cape Breton, as indicated above, includes some detached syenitic areas of considerable extent. The largest appears to range from the River St. Denys to within a short distance of St. George's Bay. Others of similar character—outliers of the great syenitic area of the northern peninsula of Cape Breton—lie in the immediate vicinity of Ainslie Lake, a large body of fresh water, with the River Margarie for its outlet, in Inverness.

11. *The Eastern, or Sydney Area of Cape Breton.*—This area, as a coal-bearing district, rivals in importance the Pictou area of Nova Scotia proper. It occupies the country around Sydney Harbour, and extends northward across the Little Bras d'Or and Boulardrie Island, and eastward and southward to Mire Bay and the Mire River. Its strata belong essentially to the Middle or Productive Carboniferous series, and consist of the usual sandstones, conglomerates, and shales, with seams of bituminous coal and fire-clay, and occasional bands of

ironstone nodules. They dip, generally, towards the coast, and their coal beds are worked in some instances to a considerable distance beneath the sea. The area thus evidently forms a portion of the western margin of a great sub-marine coal basin, the eastern or north-eastern edge of which outcrops in places on the opposite shore of Newfoundland. A fine section of these strata is exposed on the north-west shore of Sydney Harbour and around Cranberry Head. The beds at this locality dip towards the N. E. (or more strictly, N. 60° E.), at an angle of 7°; and they contain a great abundance of sigillariae with attached roots, and other examples of characteristic coal-plants. Although numerous seams of coal occur within the area, the actual seams of workable thickness do not appear to exceed six or seven in number. These have been brought up, however, at various points by a succession of undulations; and outcrops of the same seam on different properties have thus been regarded in many instances as distinct seams, and special names have been bestowed upon them.* These workable seams vary in thickness from about 4 feet to 10 feet—the average thickness being about 5½ to 6 feet. The average dip is from 5 to 6 degrees, or about 1 in 10 or 12, but the beds flatten greatly, as a rule, in descending. In some places, however, the dip is much higher. The Victoria (Ross) seam, for example, dips at an angle of 38° or 39°; and the McAulay seam, near Cow Bay, dips on one side of a sharp synclinal at an angle of nearly 45°, whilst on the opposite side the slope is only about 7° or 8°. The principal mines are situated more or less immediately along the coast, in a curved line extending from Boulardrie Island, across the Little Bras d'Or and Sydney Harbour, by Lingan and Bridgeport, to beyond Glace Bay and Cow Bay, in the south-east. The coal throughout this area is a bituminous caking coal, containing, as a rule, a very low amount of ash.

12. *The Northern Area of Cape Breton.*—This division includes the more northern portions of the Counties of Inverness and Victoria, forming the great northern peninsula of Cape Breton. Very little is

* The writer made a rapid examination of the Sydney Harbour coal country in 1873, and published commercial reports on the Collins' coal property immediately east of the Little Bras d'Or, and on the Campbell property near Glace Bay. He found no indications of faults at these localities; and he is informed by Mr. Hugh Fletcher (one of his old students, now on the staff of the Geological Survey) that late investigations have failed to detect their presence within the coal district proper, the repetition of the seams at different spots being entirely due to a series of folds, as stated in the text above. Mr. Fletcher, partly alone, and partly in conjunction with Mr. Charles Robb, has mapped and examined the entire coal area of this part of Cape Breton. See the Survey Report for 1875, and that for 1876 now under preparation.

known of its geology; but the greater portion, if not the entire surface, of its area appears to be occupied by high ranges of syenitic rocks of Pro-Silurian age, flanked by micaceous and other slates, resembling the altered Palæozoic formations which occur in the southern part of the island, with here and there a few exposures of Lower Carboniferous strata. These latter are seen along the west coast, between Margarie and Cheticamp; and on the eastern coast at Aspy Bay, St. Anne's Bay, and one or two intervening points.

PROVINCE OF PRINCE EDWARD ISLAND.

This fertile island presents a generally level or but slightly undulating surface, with an average altitude of from 100 to 200 feet above the sea. Mountain elevations are altogether unknown within its limits. The coast-line is indented by numerous bays and creeks—some of which penetrate far inland. Its geology is comparatively simple, indicating a single district only. The surface strata consist almost wholly of soft red sandstones, and other Triassic representatives in nearly horizontal or but slightly inclined beds, with here and there an outcrop of underlying Upper Carboniferous (or Permian?) strata, and some overlying drift and modern deposits.

A very complete Report on the geology of this Province, by Dr. Dawson, (with the co-operation of Dr. Harrington,) was issued by the Geological Survey of Canada in 1870. From this Report—aided by personal observation, the writer having visited the island on two occasions—the brief details which follow are chiefly drawn.

The oldest recognized strata on the island are either Upper Carboniferous representatives, or beds of transition representing part of the Permian Formation. They occur on the south coast at the Gallows or Gallas promontory, east of Hillsborough Bay, as well as on Governor Island, in the centre of the latter inlet; and they range also in a narrow strip, along the greater portion of the north-west coast, from near West Point to the vicinity of North Point. At these localities the strata consist chiefly of brown, red, and grey sandstones, with some reddish shales, and a few concretionary limestones and conglomerates. The beds at Gallas Point form a slight anticlinal, ranging roughly north and south, and extending apparently through Governor Island. These strata, both at Gallas Point and on the north-west shore, contain silicified trunks of a coniferous tree, (*Dadoxylon materiarium*, Dawson,) with several species of calamites,

ferns, and other plants belonging essentially to the Upper Division of the Carboniferous series.

These Carboniferous strata, however, are of little significance as regards the geology of the Province generally. The main area of the island, as stated above, is occupied by Triassic representatives. These consist essentially, at the lower part of the series, of concretionary, and more or less magnesian and sandy limestones, with beds of comparatively hard red sandstone and occasional conglomerates; and, at the upper part, of soft red sandstones and clayey marls. The red sandstones form the characteristic strata of the island, but calcareous conglomerates are seen in many of the coast sections on the western shore. Some of the lower beds contain obscure plant-remains and impressions; and portions of the under jaw, with attached teeth, of a Dinosaurian (?) reptile (the *Bathyngnathus borealis* of Leidy) were discovered many years ago in the red sandstone of New London, on the northern coast, a short distance east of Cape Tryon. On Hog Island, a small islet lying off the western entrance of Richmond Bay, on this coast, a dyke of dark grey trap or basalt—the only example of an eruptive rock known within the Province—runs for a short distance along the shore.

The only other rock formations occurring within the Province, consist of Glacial and Post-Glacial deposits, and some modern accumulations. Scattered boulders and deposits of boulder-clay occur more or less generally throughout the island, and are accompanied in places by stratified sands and gravels containing occasional shells of *Tellina Groenlandica*, so characteristic of Post-Glacial deposits in Quebec and the New England States. The boulders of the south-eastern portion of the island appear to have come chiefly from the syenitic and crystalline ranges of Nova Scotia, whilst those of the north shore have followed the more usual law of distribution, and have come apparently from northern sources, and principally from the gneissoid rocks of Labrador and Newfoundland.

The more recent formations of the Province comprise a series of sandy dunes, or hills and ridges of blown sand, lying mostly along the north-west coast; various beds of peat, as those of Cascumpeque Bay, Lennox Island, Squirrel Creek, &c.; and accumulations of "mussel mud." This latter deposit contains much organic matter, with carbonate and a little phosphate of lime, and is largely used as a mineral manure. It forms beds of variable thickness, exceeding in places ten or twelve feet, in many of the creeks and bays of the island.

ALEXANDER GORDON, THE ANTIQUARY.
A SUPPLEMENTARY NOTICE.

BY DANIEL WILSON, LL D.

Professor of History and English Literature, University College, Toronto.

In 1872 I communicated to the Canadian Institute some memoranda relative to a famous old Scottish antiquary, Alexander Gordon,* author of the "*Itinerarium Septentrionale*," published in 1726, and recalled anew to modern readers by the prominence assigned to it by Sir Walter Scott in the pages of "The Antiquary." The special claims which the author of the *Itinerarium* presented to notice in a Canadian journal, rested on the fact that in his later years he emigrated to the New World, and closed his life in South Carolina while that was still one of the British colonies. Attracted by the fact that one of the earliest and most diligent labourers in the field of Scottish antiquities had thus spent his later years on this continent, and among scenes so strikingly contrasting with all that had chiefly invited his research so long as he resided in the Old World, I was led to institute inquiries which happily resulted in the recovery of a copy of his will—a curious and highly characteristic document. This I forwarded to my friend, Dr. David Laing, Foreign Secretary to the Society of Antiquaries of Scotland, with a view to its being communicated to that body; and as he has supplemented its production in the Proceedings of that society, with letters and other information concerning Gordon and his works, I have embodied them here, along with some additional notes, in a consecutive narrative, as a supplement to the account already contributed to this journal.

Alexander Gordon was a native of Aberdeen, and a graduate of one or other of the universities which then rivalled each other as seats of learning on the banks of the Dee. But both christian and surname are common in that locality; and it has proved impossible either to trace his family relations, or to pick him out from among

* Alexander Gordon, the Antiquary. Vol. XIV., N. S., p. 2.

the various Alexander Gordons who figure on the rolls of the ancient University of King's College, founded by Bishop Elphinstone, or the later foundation of Marischal College. Dr. Laing thus writes:— "Whether he belonged to any of the Gordon families of note in the neighbouring district has not been ascertained. As, however, he had taken his degree of A.M. at Aberdeen, it was desirable to know both the exact date, and also if the registers might indicate anything as to his parentage. On applying to the Rev. Mr. Fyfe, Registrar of the University, he kindly examined the College registers, and found various persons of the name of Alexander Gordon, between the years 1700 and 1720, without any means of identifying them. Gordon afterwards is said to have travelled abroad, probably as a tutor, and to have spent some years in Italy, France, Germany, &c. His residence in Italy had no doubt its influence in directing his attention to the Antiquities of his native country." He must have been a persevering enthusiast, with considerable energy, and more of that versatility which is better turned to account in a new country than would ordinarily be looked for in one who expended some of the best years of his life, and all his available means, in an attempt to recover the nearly obliterated footprints of the Romans to the north of the Tyne.

Dr. Laing may be right in the surmise that Gordon travelled abroad in the capacity of tutor; but it seems probable that he had originally some little means of his own; and with the frugal habits which enabled him at length to leave a comfortable competency to his children, he found means sufficient to admit of his devoting adequate time to the investigation of the traces of Roman art and civilisation, both on the continent and at home. He must have economised his resources at a later stage; for he is our authority for the fact that he spent three years in exploring, drawing, and measuring the monuments of antiquity described by him in his Itinerary. This must have tended to exhaust his available funds before the publication of that work involved him in pecuniary difficulties, and compelled him to hasten its issue with more regard to his immediate necessities than to his permanent reputation. The volume is dedicated, as previously stated, to His Grace Charles Duke of Queensberry, Dover, &c.; but his efficient patron and ally in the exploration of the traces of the ancient Romans was Sir John Clerk, of Pennycuik, to whom he refers as the Baron, in allusion to his judicial rank as one of the

Barons of the Scottish Exchequer. He formed a large and valuable collection of antiquities, chiefly of the Roman period, and devoted himself with great zeal to their elucidation; but the only other production of his pen, besides his letters communicated to the Society of Antiquaries of London, and his correspondence with Mr. Roger Gale, is his tract, entitled, "*Dissertatio de Monumentis quibustem,*" &c., printed at Edinburgh in 1750, when Alexander Gordon had been settled for years in His Majesty's plantations beyond the Atlantic.

One of Gordon's letters, recovered by Dr. Laing from the Anderson papers in the Advocates' Library, is addressed to the author of "*Selectus Diplomatum et Numismatum Scotiæ Thesaurus,*" and other well-known works. From this letter we learn that he had borrowed Anderson's copy of Sir Robert Sibbald's "*Historical Inquiries concerning the Roman Monuments and Antiquities in the north part of Britain called Scotland.*" Though at that date only published sixteen years before, the elder folio of Roman Antiquities had already become scarce. Gordon had ranged over all the book-stalls in vain search for it, though he now had a promise from "Paton" to procure him a copy. This is, no doubt, Mr. John Paton, a well-known bibliopole of the time, whose tastes were reflected in his son, George Paton, the correspondent of Tennent, Gough, Stukeley, and other antiquaries of his day; and famous among the same elder generation for his collection of choice and rare books. Writing to Mr. Anderson on the 19th of August, 1723—that is about three years before the publication of his own "*Itinerarium Septentrionale; or, a Journey thro' most of the Counties of Scotland, and those in the North of England*"—Gordon says:

"Since you did me the favour of lending me Mr. Sibald's book, I have been very much instructed and informed by it, have therefore ranged over all the booksellers shoaps in town in search of purchasing it, but to no purpose, save that Paton has promis'd to procure me it this week. However, seeing the Baron and I probably go out of town to-morrow, I have in a manner an indispensable necessity of having that book of Sibald's along with me in my antiquary peregrination, so if I could so far prevail on your goodness to lend me it till I come back from the virtuoso Tuer, which can be no farther than Glasgow, Sterling, and Perth this Summer, I should take it as a demonstration of very condescending goodness in you, seeing I can

nott get another at present ; and this book is absolutely necessary for my designes, seeing it directs me to 50 or 60 places which I know nothing about, besides am to trace the *Vallum* according to the stages sett down in his draught. All this considered, and that it may chance to be of publick good, I hope you'l indulge me with this favour which I came to ask of you in person ; but I heard you was at the Fowl Briggs ; am therefore impatiently waiting your commands this way, or if possitively you will have it returned, I shall ; but at any rate should not keep it long from you."

From this we learn that Gordon was to start, in company with Baron Clerk, on the following day, on what he styles an "Antiquary Peregrination," or "Virtuoso Tuer," to the Roman camp at Ardoch, and the remoter footprints of Imperial Rome lying beyond the Tay ; as well as to trace the line of the Antonine Wall between the Forth and Clyde, on the details of which, as it existed one hundred and fifty years ago, his own learned folio throws much light.

Sibbald's folio was the *vade mecum* of northern antiquaries, till superseded by that of Gordon ; who shows his gratitude for the invaluable aid derived from a predecessor to whose diligent researches he owed the direction to fifty or sixty places, about which, as he acknowledges to Mr. Anderson, he would otherwise have remained in total ignorance, by never wearying in giving expression to his astonishment at his blunders and shortcomings. We have therefore to picture to ourselves Sandie Gordon, mounted, like Don Quixote on his Rosinante, with Sibbald's "Historical Inquiries" stowed away in his huge saddle-bags, for reference, as "a matter of indispensable necessity," in many a learned discussion with the Baron concerning the true country of the Brigantes ; the sites of Borcovicus, Alauna, *Æsica per lineam Valli*, and above all, that of the world-famous battle of Mons Grampius. "If these be in Scotland," he exclaims with bitter irony, at the close of a controversial dissertation on his predecessor's narrative, "Sir Robert must be in the right, and Pancirolus and Cambden in the wrong ; which no man, I think, that has any pretence to learning, will now assert." But such was the belligerent fashion of an age which Scott has reproduced for us with such graphic humour.

In this and similar exploratory tours, Gordon made himself master of the details of Roman and other early remains embodied in his dry, but patiently-elaborated folio, which owes the revival of its fame to

that memorable event in the world of fancy, when Jonathan Oldbuck undid his brown-paper parcel in the Hawes Fly, or Queensferry Diligence; and, on his fellow-traveller inquiring as to the nature of the volume which formed the object of his study, "he lifted up his eyes with something of a sarcastic glance, as if he supposed the young querist would not relish, or perhaps understand, his answer, and pronounced the book to be Sandy Gordon's *Itinerarium Septentrionale*, a book illustrative of the Roman remains in Scotland."

The experiences of the laborious and learned author were very much of a piece with those of others who, before and since, have undertaken such work. Of fame, of the sort attaching to such labours, he had his share. He carried on a correspondence with Sir John Clerk, and Mr. Roger Gale, a well-known English antiquary, the fruits of whose labours, along with those of his brother Samuel, are preserved in the *Reliquiæ Galeanae*. The results of this correspondence were communicated from time to time to the Society of Antiquaries of London, whither Gordon had removed on the completion of his work. To such publicity they made no objection; but by and by they manifested some professed alarm at the hint of Gordon's design to issue their letters to the world as a supplement to his own folio. On the 16th of April, 1726, Sir John Clerk writes to Mr. Gale:—"I received this moment the honour of yours of the 9th instant, and at the same time one from Mr. Gordon, wherein he tells me that he had laid aside all thoughts of inserting our letters in his Appendix, and that he was only to take the substance of them in his own way. This piece of news pleases me extremely; and I hope you will keep him to his word."

The most, however, that Gordon could be persuaded to, appears to have been the withholding of his correspondents' names. He printed a folio tractate of "Additions and Corrections, by way of Supplement, to the '*Itinerarium Septentrionale*,' containing several dissertations on, and descriptions of, Roman Antiquities discovered in Scotland, since the publishing of the said Itinerary; together with Observations on other Ancient Monuments found in the north of England, never before published;" informing his readers that, since his writing the Itinerary, he had been favoured with the following letters "concerning the Sepulchres, and Funeral Rites, of the Ancients in Britain, from two gentlemen who are the honour of their age and country:" and he adds, as a sort of apology for the use he

is thus making of their correspondence: "The subject is so much to my present purpose, and withal, so curious, and their manner of handling is so judicious, that without further apology, I shall present them in their own words." So he accordingly printed a fasciculus of thirty pages, with four additional plates; and, after the fashion of that age of patrons and literary clients—so different from our own,—he dedicated the thirty pages of borrowed learning, not to their author, but, "To the Honourable James Makrae, Esq., late Governor of Fort St. George," whose acquaintance he appears to have made during his sojourn in Italy; and who had continued to manifest a sympathy with his Roman researches after the return of both to Scotland. He thus writes to him:—"The many favours I have received from you, when I was honour'd with your acquaintance abroad, and the continuance of them at home, oblige me to take the first opportunity of declaring to the World how much I am indebted to your friendship," and so he begs him to "accept these Papers, not as any retribution for the many favours receiv'd, but as a sincere acknowledgment of a grateful heart."

But, unfortunately, in his efforts to gratify one patron, Gordon was in the fair way of offending others; and all the more so that he contrived, in printing the letters of Baron Clerk and Mr. Gale, to grieve the eyes and vex the hearts of the two fastidious Antiquaries by some slovenly misprints. But the evil being done, and irremediable, Baron Clerk played the philosopher with an amiability in noticable contrast to the wonted characteristics of the *irritable genus*; and thus writes to his fellow-sufferer:—

"I cannot now help what is done, but have caused the errata to be printed after the Appendix in as many copies as are to be sold here; I likewise ordered the printer to send them to Mr. Gordon, that they might likewise be inserted in other copies.

"To return to Mr. Gordon, tho' he had done me a great kindness not to put me so much in his records, yet I am obliged to forgive him, for I dare say he had my credit no less in view than his own. As to the errata, I must impute them to my own bad hand and way of writing, with which, I doubt, you are scarcely acquainted as yet. As to the rest of Mr. Gordon's book, it is really a book above my expectation, and might have pleased everybody had he been less precipitate in publishing it. I was not wanting in giving him Horace's advice:

—Nonumque prematur in annum:
Membranis intus positis, delere licebit
Quod non edideris; nescit vox missa reverti.

But, possibly, he has done better if he has acquired by it new and able friends to get him put in a new way of living."

Sir John Clerk thus amiably recalls the fact that while Mr. Gale and himself were amusing an idle hour with antiquarian research as a pleasant pastime, Gordon, with self-sacrificing zeal, had thus far made it the business of his life. The traditions of Pennycook House recalled the author of the *Itinerarium* as an austere, formal enthusiast, who had won for himself the soubriquet of *Galgacus*, from his abounding zeal on the subject of the famed battle of Mons Grampius and its Caledonian hero. "It was not in vain," he exclaims, "that Galgacus, in his speech to his army, made use of this expression: 'We, the bravest and most noble inhabitants of all Britain, and seated in its very bosom, never so much as once looked on countries of servitude, nor were our eyes at any time polluted with objects of slavery;'" he then adds: "that their situation being at the extreme part of the world, among them only were liberty and fame remaining." And so Gordon goes on to quote and translate the "Nos integri et indomiti," &c., of Tacitus, and to produce anew the Caledonian chief's fictitious rhetoric: "If I be slain in Caledonia, 'twill not be inglorious to have it said that I fell in a country which is the extreme boundary of the earth and nature!"—and all this with a faith in the old Historian's rhetoric equal, at the least, to what we are wont to extend to "Our own correspondent" of the *Times*. His weakness on this point was familiar to Sir John, and he adds: "I cannot omit making some apology for him in relation to what he says of the speech of Galgacus. I once endeavoured to persuade him that it was only a fiction of Tacitus conformable to a liberty among historians, and that there was no reasoning from any thing contained in it to the advantage either of Galgacus or his Caledonians; but Mr. Gordon's high respect for his country hath carried him too far, and made him commit a sort of laudable fault. There are other instances of this infirmity; but his business as an antiquarian will atone for all: the best that could be said for the Caledonians was, that though they had been conquered, yet the Romans could not retain their conquests. I am, I confess, of the opinion of some learned men, that it is a reproach to a nation to

have resisted the humanity which the Romans laboured to introduce. As to the rest of Mr. Gordon's book,

Ubi plura nitent—non ego paucis offendar maculis."

Mr. Gale is less amiably inclined. He, it seems, has been *particeps criminis*, having been seduced into favouring and aiding in the publication of the letters, under the belief that it was done with the Baron's approval. After all, perhaps, we may attach too much importance to the coy pair of dilettanti, who did not very bitterly resent the publication of the learned prelections of two such "honours of their age and country," if only the printers and proof readers had presented them to the public eye in more faultless form. The purposed printing of a supplement by Gordon, to his folio, was undoubtedly known to his correspondents, for Mr. Gale, in writing to the Baron about a Roman inscription rescued from the crypt under Hexham Church, in Northumberland, tells him that Gordon designs to publish another inscription, one of Septimius Severus, in his Appendix.

Some of the learned speculations of Gordon's correspondents, which they had no objection then to communicate to the London Antiquarian fraternity, and to the world at large—so far as anybody outside of that learned fellowship troubled himself about such matters,—read oddly enough to us now. Gordon's Itinerary must have been passing through the press when Mr. Gale wrote to Baron Clerk, telling him of one of his letters, that it was received by "our Society with all the applause due to its merit: that is the greatest. I have their commands to desire your acceptance of their thanks for those just observations made by you on the ancient ways of sepulture used by our ancestors, and to beg your leave that they may be inserted into their Archives." But the Society of Antiquaries had not yet begun the publication of their "Archæologia, or Miscellaneous Tracts relating to Antiquity," and indeed did not do so for nearly half a century thereafter; so that, but for Gordon's zeal to supplement his own researches with the speculations of his learned patrons, their illumination of the obscurities of an ancient past would have been to as little purpose as the lighting of the "Perpetual Lamp," which the Baron describes to have been dug up under a cairn in his own neighbourhood. Such lamps, he goes on to say, were lighted and placed by the ancients in their urns; and, if some people are to be believed, "Upon the opening of an ancient sepulchre, light has

been perceived in those lamps, which was extinguished on the admission of the air !”

Mr. Gale responds with English experiences in the same line of sepulchral exploration. Lord Pembroke had opened above twenty tumuli in the neighbourhood of Stonehenge, some of them when Dr. Stukeley and himself were present ; and so he is able to interchange antiquarian wonders and learned speculation in this pleasant fashion : “ Whatever people, whether the old Celts that first came into this island, which seems to me most probable, or the later Britains, erected that stupendous monument of Stonehenge, it certainly was in great veneration, as long as our heathen ancestors possessed the place ; for so the many interments here do plainly argue. And what is very remarkable, this sacred spot is crowded with these sepulchral repositories, as far round every way as they could lie in sight of the temple ; but as soon as the view is intercepted by the circumjacent rising grounds, you see no more barrows, or funeral circles. Burying the body in the earth was, no doubt, the most ancient way of disposing of it after death ; though, that burning it was very old is evident from your undeniable quotations. Olaus Wormius will have burning of the most antique usage among his northern heroes ; and tells you, in the first book of his *Mon. Danica*, the very time when burying them with their horse and arms came in fashion, which was at the death of King Dan, who reigned in Denmark when Joshua passed over Jordan ; and who can doubt it when he is so exact in his chronology.”

Mr. Gale had not the remotest idea of jesting when he thus wrote in commendation of the indubitable accuracy of the old Danish historian, in thus establishing a precise chronology for King Dan and his times. It was in accordance with his ordinary style, which he accompanied with adulatory phrases, and gracious apologies about “ trespassing farther upon your patience, which I fear has been sufficiently tried,” and the like suave terms : all in the stately phraseology of that eighteenth century. Privately, he thus responds in simpler fashion, concerning the publication of such letters :

“ By what Mr. Gordon had said to me, I concluded he had your free leave to publish your letters, otherwise should by no means have parted with them to him, much less have suffered my crude and hasty answers to have attended them into the world, had not the printing of yours indispensably required it. The errors you complain

of must be wholly imputed to the stupidity and perverseness of the printers. I corrected the sheets myself with all the care I could; and finding, when the book was finished, most of their faults still left, I persuaded Mr. Gordon to stop the publication of it for a week, whilst those sheets might be once more corrected and reprinted, which he did; but then returning from the press with some of the old errata set right, and new ones added in their room, stop them again he could not, having engaged a second time in the publick prints to deliver them at a certain day to his subscribers, which promise having broke, upon pretence the map was not ready (though the delay in reality was only to reprint the aforementioned sheets), he thought he could by no means excuse another non-performance of his engagements. I offered him to peruse every sheet of the whole book as it came out of the press, for which he seemed very thankful, but never sent me one, except those of the Appendix, containing our letters. I wish it was not his, being persuaded that he was perfectly right in all his notions which occasioned it, though you see as well as myself that he is not clear of mistakes; to which I must add, an impatience of getting the work abroad upon the prospect of getting a little money by it, his circumstances, as I believe, requiring and prompting him to it. I hope also that it has been a recommendation to him to some of our great men here, who, as he tells me, have given him some reason to expect they will do something for him. He may urge in his defence that strong plea of *Res angusta domi* for his hasty publication, as he may that other of *Vincit amor PATRIÆ*, where his zeal for the honour of his country has sometimes caused him to enforce his arguments too far."

What author does not know the grief of proofs returning from the printers with new errors added in lieu of the old ones set right. Of fame, as we have said, Gordon had some share in his lifetime, to say nothing of the honours that awaited him in the pages of "The Antiquary." In 1731, as we learn from one of his memoranda: "Some lovers of antiquity in Holland being now printing a Latin edition of my 'Itinerarium Septentrionale,' were desirous to know, at the time they began the said work, if I could transmit to them any additions and corrections for the original in English." If there was nothing else to tempt to such a translation of his learned work, there was his memorable parallel to the Julius Hoff, or Arthur's Oon, of Caligula's Pharos in Holland, which, having these following

letters C. C. P. F., is read *Caius Caligula pharum fecit*. He hastened to communicate the joyful tidings to the Baron of Penny-cuik. He had printed the corrections, and proposed additions, for the benefit of his old subscribers; but he only partially removed the blemishes of his sensitive patrons; and had in other ways failed in that humble deference which was expected from the literary client of the eighteenth century. The Baron accordingly hailed the prospect of a Latin edition, addressed to the learned cognoscenti, not of Holland only, but of Europe, and thus wrote to Mr. Gale:

“I had the favour of yours of the 11th January, but could not get so much time as to thank you for it, such was the hurry of some affairs in which I am concerned; and on the like occasions you have been so good as to excuse me. I never saw Mr. Gordon’s Supplement till within these eight days. He had done well either not to have printed at all, or done it with less precipitation. His dispute with Dr. Hunter (physician at Durham) is amusing, for both what he and the doctor says, about the time of erecting the Basilica, may be true. I was out of all patience when I found him making remarks on some of your observations, which, I believe, were never printed; but, it seems he is one of those that would rather lose their friend than their jest, and a little more learning would make him a compleat modern critic. I have been sorry often to observe such weaknesses; but I was so much obliged to him for the happiness he introduced me to of your acquaintance, that I could overlook many faults in him. I beg it of you not to discountenance him altogether, but continue to give him your good advice, though he may be very little capable of benefiting by it. I have troubled you with the inclosed to him, which I beg you would allow a servant to carry him. I see he has helped off some of his errata in the ‘*Itinerarium*,’ but has taken no notice of some ridiculous things he made me say; wherefore I have sent him a few corrections, if there be place for them in his Latin edition.”

The original edition of the *Itinerarium Septentrionale* bears on its title—which is more in the fashion of a modern preface,—that it is printed for the Author; and sold by G. Strahan, at the Golden-Ball, in Cornhill; J. Woodham, in Russel Street, Covent Garden; W. and J. Innys, in St. Paul’s Church-Yard; and T. Woodward, at the Half-Moon, near Temple-Bar. But, for some reason or other, a change took place; and other copies have a new title, printed with the date

1727, and a different list of booksellers. In all probability, having supplied his original list of subscribers, he parted with the remaining copies; and so, while the 1726 edition bears on its title that it is "printed for the Author," and sold by the above-named booksellers, the later one is said to be printed for F. Gyles, D. Browne, &c. At a later date this was further supplemented by the Appendix and extra plates; and that again, in certain copies, by Sir John Clerk's errata; so that the modern book collector has to look out for the latest issue, unless he is curious in first editions.

From the letter of Sir John Clerk quoted above, it appears that the introduction of Mr. Roger Gale to the Baron of Pennycuik was due to Alexander Gordon; but, with all his submission to the deferential requirements of the age, the diligent and enthusiastic Author of the *Itinerarium Septentrionale* would, it seems, too frequently follow courses that seemed best in his own eyes, and even venture to hold to his own opinions in spite of the suggestions of such learned advisers.

It does not appear that the proposed Latin version of the Itinerary, with Baron Clerk's addenda, and the author's own additions and corrections, ever issued from the Dutch press; and from his English edition—notwithstanding all the fees from subscribers, and gratuities in acknowledgment of special dedications of plates, maps, &c.—it is to be feared that the returns for all his self-sacrificing labours were meagre enough.

The advice which that patrician dilettante, Horace Walpole, gave to the poet Chatterton, when he asked his aid to assist him in procuring some position where he might pursue the bent of his genius, was, to stick to his drudgery, and "when he should have made a fortune, he might unbend himself with the studies consonant to his inclinations." The advice would have suited the Scottish Antiquary as well as the marvellous Bristol boy. He could not dally with the antiquarian Muse—if such there be,—like the laird of Pennycuik, or his English ally, who acknowledges some little force in the poor author's anticipation of the prospects of getting a little money by his work. It is manifest that he had pecuniary difficulties, wranglings with booksellers, and trouble enough with touchy patrons; and, from Mr. Gale's allusion to "that strong plea of *Res angusta domi* for his hasty publication," I infer that he had already married, and had the cares of a household added to his other anxieties.

Dr. Laing has recovered from Nichol's "Literary Anecdotes" the following letter addressed, in 1726, to Joseph Ames, who ultimately became Gordon's successor as Secretary to the Society of Antiquaries of London. Ames had, in all probability, been engaged in canvassing for subscribers to the Itinerary; in which case, if the poor Antiquary had discharged his tailor's bill, and otherwise expended on his behalf £26 10s. out of the expected profits, one can understand his reasonable desire to stay any further demands for such service till he saw what he should have for himself:

"To Joseph Ames. Tuesday, 21st June, 1726. SIR,—I received your letter of Monday, in which you desire me to meet you at the Quaker's, which I cannot, by reason of a prior engagement with Mr. Mackay and others; nor do I know well what you mean by insisting on my promises, seeing, I think whatever I promised I have faithfully fulfilled, in a manner sufficient to any services I have had of you, which if you are not content, nor willing of a continuation of friendship, if you have a mind that justice shall decide the matter, let me know, that my attorney may appear, wherever you think proper to let me know, in a friendly manner, and if required, shall have sufficient bail ready, till a judge decide our difference. For my part, I thought by this time, on receipt of your clothes, you had been perfectly satisfied; and that the value of L.26, 10s. is reward for all you have done me. I think you go a very strange way to work in gaining friends and people's esteem, by such unreasonable pretensions, when you know with what difficulty I can get the two ends of my book's expense to meet. I did not expect this at your hand. Had you been easy till I had seen what profit I may have if any, or how my matters stand, I still would have exerted myself on your account, as I have already done, which is all from, Sir, your most humble servant, ALEXANDER GORDON."
 "P.S.—With the evening tide I go for Richmond to Sir Andrew Fountain, then to Twitnam, with Brigadier Bisset's books, next to Hampton Court, about a particular affair; so when I return I shall be very willing to lay the affair before Mr Colvill and Mr Richardson, your two friends; and I hope thereby exonerate myself and conduct in any affair betwixt you and me."

Sir Andrew Fountain, to whom he refers in this postscript, was, I imagine, the author of "Numismata Anglo-Saxonica-et Anglo-Danica breviter illustrata," a learned folio, published at Oxford in 1704.

The date would make him considerably the senior of Gordon: but this accords with other evidence which points to friendly relations between the venerable knight whose numismatic labours supplement Hickeys' Thesaurus, and the Romano-Scottish Antiquary. Numismatics were not overlooked by the latter; and his *Itinerarium* includes a notice, with engravings, of the famous Anglo-Saxon Runic Cross at Ruthwell, in Annandale, which he characteristically describes as "in form like the Ægyptian obelisks at Rome." It is not difficult, therefore, to imagine motives which tempted Gordon to make his way, from time to time, to Richmond; or to conceive of the welcome he received from the old knight, as he produced some choice coin or obscure inscription, over which the two could spend hours of not less keen discussion than those of Sir Arthur Wardour and the Antiquary *par excellence*, either at Knockwinnock Castle, or in the dining room of Monkbarns. In the account of Baupré Bell, another learned numismatist and antiquary, given in the "Literary Anecdotes," Mr. Nichols says, he made a cast of the profile of Dr. Stukeley, prefixed to his "Itinerarium," and an elegant bust of Alexander Gordon, after the original, given by him to Mr. Andrew Fountain's niece.

In 1723, as we have seen, Gordon traversed the line of the old Roman wall and military road between the Forth and the Clyde; and so was able "to show how the track, vestiges, and circumstances of this wall of Antoninus Pius, commonly called Graham's Dike, appear on the ground to this day, having taken an actual survey thereof for that purpose, with a mathematical instrument, and measured its track with a Gunter chain the whole way from sea to sea." The fruits of this laborious survey, as he further tells us, he had minutely elaborated in a great map of six large sheets, which he designed very soon "to publish by itself, it being impossible that any book whatsoever should contain it." But this projected publication of the survey of a piece of military engineering which had fallen into disuse for fully thirteen centuries, assumed ere long a much more practical form. Sir John Clerk, writing on the 29th of August, 1726, to the English antiquary to whom he had then been recently introduced by the author of the aforesaid survey, informs him that Mr. Gordon is then expected in Edinburgh, "with his head full of a project, to make a communication between Clyde and Forth by a canal; when I see it is probable he will be less fond of it, for

his project has been thought of a good many years ago, but it has been judged the profits would not answer the charge." This may be accepted as an index of the general encouragement which he received on his arrival in Edinburgh. His stay there accordingly was of the briefest. *Within a week after he appears to have been in London,* and there to have spread out his six large sheets on which his projected canal was traced traversing the old Roman vallum, mile forts, and military way, not only before the incredulous eyes of Mr. Roger Gale and Lord Islay, but before Sir Robert Walpole himself. Mr. Gale replies to his northern correspondent :

"I told Mr Gordon my thoughts of his project to cut through the Northern isthmus, very freely. I could not see what manner of commerce could be so promoted by this new passage, as to pay the immense expence it would require to perfect it; at the same time the public is so poor here, and so many necessary demands upon it, that I am sure it will be impossible to obtain the least sum for such experiments, and I believe your treasury in Scotland is not much richer; he has, however, communicated it to some great men. My Lord Islay treated it, as I hear, with great contempt; and if Sir Robert Walpole gave it a more favourable reception, it proceeded from the recommendation of Secretary Johnson, and from his usual affability and desire to dismiss everybody that applies to him as well pleased as he can." The politic minister of George I., it would seem, flattered the hopes of the enthusiastic projector with commendations of a scheme which was ultimately proved to be not only practicable but useful; but it was not till fourteen years after Gordon's death, and long after he had ceased to trouble himself either with the antiquities or the improvements of his native land, that Parliament gave its sanction to the scheme for cutting a navigable canal between the Forth and the Clyde. Still later the British Government aided the work by contributing the sum of £50,000 from the Scottish estates forfeited in the rebellion of 1745; and at length, in the year 1790, vessels sailed from sea to sea over the track of the old Roman road successively surveyed by Agricola, and by Lollius Urbicus, the prætor of Antoninus Pius.

How long Gordon laboured in the vain endeavour to persuade the men of his own day to undertake the construction of a navigable passage across the Northern Isthmus, does not appear; but when he found the project was a bootless one, he once more betook himself to

his pen, and in 1729, published in folio form, his "lives of Pope Alexander VI. and his son Cæsar Borgia: comprehending the Wars in the Reigns of Charles VIII. and Lewis XII., Kings of France; and the chief Transactions and Revolutions in Italy, from the year 1492 to the year 1506." The volume is illustrated with portraits of Alexander VI. and Cæsar Borgia, the former of which Dr. Laing assigns as probably etched by Gordon himself. If so, it exhibits great skill, and the facility of a practised handler of the etching needle. It is a folio plate representing his Holiness seated, in full pontificals, wearing the triple crown, and holding in his right hand the symbolic keys. The drawing is by *Thom^s Sadler, Arm. Londini*: the contribution probably of an amateur draftsman, whose name figures as one of the patrons of the volume, among a list of subscribers, including Dukes, Marquesses, Barons, and Judges, Bishops, and Archdeacons, Baronets, Knights, Honourables, and Esquires, headed by Her Most Gracious Majesty, Queen Caroline. The engraver's name is thus obscurely indicated: *Al. Sculpt.*, possibly an abbreviation designed to indicate the christian name of Alexander Gordon. The portrait of Cæsar Borgia, with its motto: *Aut Cæsar, aut Nihil*, contrasts with that of the Pope, as a highly finished engraving by T. Vandergucht, from the beautiful half-length painted by Titian. Gordon followed up this result of his Italian studies by publishing his translation of the Marquis, Scipio Maffei's "History of the Ancient Amphitheatres," and in particular that of Verona. The subject might not seem a very popular one for a goodly 8vo. volume of upwards of four hundred pages, with twenty-five engravings; but it met with acceptance, and reached a second edition.

Next followed the only known dramatic production of this strange, versatile genius, his "Lupone, or the Inquisitor. A Comedy. London, printed for J. Wilford, behind the Chapter-house in St. Paul's Church-yard, 1731." It is dedicated to his Grace Cosmus, Duke of Gordon; and Dr. Laing states that a copy of this Comedy now in his own possession, which was obtained from the Roxburghe collection, has this pencil note, after the Duke's name: "Then (1731) eleven years old. After his father's death in 1728 he was educated in the Protestant religion." This explains the first part of the dedication, which begins "MY LORD, the sincere regard for truth, of which your Grace has given the world such early examples, renders you the proper patron of every attempt that tends to the expos-

ing those whose employment is to promote the most pernicious error that ever deluded mankind." The scenes of the Drama are laid in Naples; and Lupone, a Dominican friar, is styled chief Inquisitor. The author does not seem to have aspired to the tempting profits of the stage, though to few men of his day could its rewards have proved more acceptable. He would seem rather to have been inspired by somewhat of the protestant zeal which at a later date animated the notorious Lord George Gordon, a son of this same youthful Duke to whom the author of "Lupone" addressed his approving dedication. It was, indeed, an age of protestant ascendancy, in which the lineal claimants to the throne of James II. helped to keep alive the spirit of antagonism which his bigoted folly had evoked. The lives of the Borgias appealed to this prevailing sentiment; and Gordon characteristically writes in the preface: "Some zealous partizans may perhaps give out that this is solely published as a protestant piece of malice, to depreciate that church of which this scandalous Pope whose life I now write was head. But they may please know that it's neither my choice or design to disparage the religion of any church or mortal, but to leave theological controversy to our ecclesiastical champions of profession. I therefore hope, as a lay admirer of truth, without choice or design to arraign any particular system of religion in a wicked professor, and even head thereof, I may be allow'd so far to enjoy the glorious liberty of a country unterrified with Inquisitions, as to acquaint the world with matter of fact, by collecting from Roman Catholick authors the scatter'd life of an infamous Pope; which disagreeable subject I, perhaps, would not have undertaken, were not the contemporary facts in his pontificate the most surprising, and the revolutions which then happen'd the most extraordinary and curious, of any to be match'd in history."

Such is the style in which the author appeals to the popular English sentiment of his day, while deprecating the charge of producing "a protestant piece of malice." As a dramatist, as well as a historian, he derives his inspiration, not from English, but Italian proceedings; and he no doubt hoped for some pecuniary returns from this novel literary venture; for his experiences in the battle of life were such as are only too familiar to the literary enthusiast. Nichols, in his "Literary Anecdotes," reproduces a note, written by John Whiston, a London bookseller, which says of Gordon, "He was but in narrow circumstances. For some time he was in partnership with Mr.

John Wilcox, bookseller in the Strand; but his education, temper, and manners did not suit him for a trade." Whiston appears to have had some prejudice against him, as he says further, "He had some learning, some ingenuity, much pride, much deceit, and very little honesty, as every one who knew him believed. Poverty tempted him to dishonesty; his national character and constitution, to pride and ingenuity; and his dependence on the great, to flattery and deceit." The allusion to his "national character" reminds us of the prejudices which the revolution of a little later date intensified into the passionate antagonism of Smollett's "Briton," and Wilkes' "North Briton," with the pungent bitterness of Churchill's "Famine, a Scottish Pastoral," and others of his satires. No doubt the poor Antiquary found it hard enough to meet all demands, and keep his accounts square with printers, booksellers, traders, and housekeepers. Dr. Laing has recovered a letter, addressed by Gordon, in October, 1739, from his lodging in St. Martin's Lane, to Mr. Nourse, a bookseller at Temple Bar, in which he says: "I shall be obliged to you if you will at your leisure draw out the Credit part of our accompt, what you shew me in your shop last time is the Debtor side of your books I had of you; but I can instruct that you had 24 setts of my Dessertations on the Mummies sent to you, and not 18 as your memory misleads you in thinking, and as such I shall instruct it upon oath if required; besides I cannot possibly be owing you a ballance of a guinea, for you may remember after you had your Diogines Laiertius you told me yourself and since, that the ballance due you from me was about 18 or 19 shillings, and I dare say if you ever have stated your number of those Dissertations you received, and sold, right in your books, you will find I owe you no more. I should be sorry to have the same difficulty with you in settling this, as Mr. Mackerther says he has had in his accompts with you. What I have told you is facts I can prove, therefore I am determined I will pay you no more then the ballance we had before settled, and what I realy owe you."

Three years before the date of this letter Gordon had been appointed Secretary to the Society for the Encouragement of Learning; and had succeeded Dr. Stukeley in the Secretaryship of the Society of Antiquaries. He was also indebted to the latter for his introduction to the Egyptian Club, for which also he performed the same duties for a time; and so had his attention diverted to what constituted there-

after his favourite hobby. In 1737 he published "An Essay towards Explaining the Hieroglyphical Figures on the Coffin of the Ancient Mummy belonging to Captain William Lethieullier;" and also another "Essay towards Explaining the Antient Hieroglyphical Figures on the Egyptian Mummy in the Museum of Doctor Mead, Physician in Ordinary to his Majesty." Those, therefore, are doubtless the "Dissertations on the Mummies," about the disposal of which their author had got into hot controversy with Mr. Nourse, and gave him his mind in such blunt fashion.

Alexander Gordon had now, from his secretaryships and other labours, some sure, though moderate, income; and, with a less troubled mind, he turned his old enthusiasm in the direction of his later studies, and undertook the elucidation of the hieroglyphic mystery, and the illustration of "all the Egyptian Mummies in England." To his essay towards an explanation of the hieroglyphics on Dr. Mead's Mummy, he adds this information for the benefit of the reader: "The Two preceding Essays being design'd to explain Three of the Twenty-five Copper-plates already deliver'd to Subscribers, an Explanation of the remaining Prints will come forth with all convenient speed; first, what belongs to the other ancient Mummies exhibited in the said Plates; next, what regards the rest of the Monuments on Stone, Wood, Metal, &c. N.B.—When this is finish'd according to the Terms of the Subscription, the Author intends to offer the Public another Work, viz., The History of the Egyptians, from the earliest Accounts given of them, to the Time of Darius, cotemporary with Alexander the Great; which Work is not intended to be publish'd by Subscription, and is now very near ready to put to Press."

Here, as Gordon conceived, was to be his *magnum opus*, which was to bring him wealth and renown; nor did he lose faith even in its pecuniary value to the close of his strangely-chequered career. Perchance it was on the faith of such uncoined wealth that he married, and so made the discovery that the growing responsibilities of a household tended to intrude matter-of-fact cares of the present on a mind preoccupied with buried Pharaohs and the inurned Romans of ancient Caledonia. In the latter researches he had had special reason for referring to his "curious and honoured friend, James Glen, Esq., Provost of Linnlithgow:" the same James Glen, of Longcroft, Esq., as I surmise, who figures among the select subscribers for royal copies of the "Itinerarium Septentrionale;" and whose name reappears among

those attached to the lives of the Borgias. In 1741, James Glen—son, it may be, or other relative of the old Provost, and laird of Longcroft,—set out for the New World to fill the office of Governor of South Carolina; and in his Excellency's company, probably as his private secretary, there went Alexander Gordon, with a son and daughter. He was already, I presume, a widower. It is, at any rate, apparent from the terms of his will that his wife predeceased him. The step seemed at best a dubious one. The antecedents of the Antiquary did not furnish great promise of fitness for colonial life. The deciphering of Roman altars or of Egyptian mummy inscriptions was in equally little request there. But he was a man of varied acquirements—a good draughtsman, a surveyor, a musician, a portrait painter, and master alike of ancient and modern languages. He had, moreover, a friend in the new Governor; and so we learn from a record in one of the public offices at Charleston that he obtained a transfer of the office of Registrar of the Province; and, as his predecessor Registrar Hamerton's attorney, was appointed to transact all the business and receive the fees of the office.

Here then, after a desultory and wayward career, we find the poor Scholar and Antiquary entering on brighter prospects; and all that we know of his subsequent history shows that he neither lacked the prudence nor judgment requisite to enable him to profit by the opportunities of a young colony. He acquired houses and lands; found leisure to indulge in his early love of art; and, not only painted his friends in oil, but left behind him a portrait of himself, which, it is to be hoped, may yet be identified. For thirteen years he continued to flourish in South Carolina, cherishing his old tastes, and looking forward hopefully for the time when he should be able to give the world at large the benefit of his matured views on the history and mysteries of Ancient Egypt.

So early as 1737, Gordon announced that his History of the Egyptians was nearly ready for the press; and in Bowyer's "Literary Anecdotes," this work is said to have been left by him in MS., under the title of "An Essay towards illustrating the History, Chronology, and Mythology of the Ancient Egyptians, from the Earliest Ages on Record, till the Dissolution of their Empire, near the time of Alexander," with the date London, July 6, 1741. This date probably marks the last finishing touch put to his manuscript on the eve of his departure for his new-world home beyond the Atlantic. But we

have the best evidence that the prized treatise was not left behind him when its author bade farewell to his native land.

As his prospects brightened in his new home, and comforts unknown till then cheered his hearth, he no doubt brought forth the cherished sheets, and added fresh point to his learned essay ; till the time came when, on the 22nd of August, 1754, "being sick and weak of body, but of sound and disposing mind, memory, and understanding," and with the ruling passion strong in death : he proceeded to make and ordain his last will and testament.

It was the recovery of a certified copy of this will which led me to produce the former notice of its author to the members of the Canadian Institute, as a document alike curious as the characteristic memorial of a literary man of mark in the eighteenth century ; and interesting as the recovered trace of an old colonist of some note in his day, but of greater interest now from the prominence given to him in one of the most popular of Scott's novels. To his son and daughter he bequeathed his household furniture, plate, houses, landed property, &c., in a mere passing sentence ; while the main paragraphs of this testamentary document suffice to show how little change a sojourn of thirteen years amid the strange novelties of the western hemisphere had wrought on the scholarly enthusiast. Having given instructions that his body be committed to the dust "decently, and in a Christian-like manner," he condescends to the disposition of what he is pleased to call "the worldly estate wherewith it has pleased God to bless me with," and thus proceeds : "I give the same and dispose thereof in manner following :—First, It is my express will, and I do hereby order and direct, that my said executors hereinafter mentioned, and the survivors of them, and the executors and administrators of such survivors, shall forthwith and with all convenient speed after my decease, pay off, discharge, and satisfy my funeral charges and all other my just and lawful debts ; and after such payment and satisfaction so made and rendered as aforesaid, then I give, devise, and bequeath unto the Honourable Hector Berrenger De Beaufain, Esq., his picture, portraiture, or effigies by me the said testator, painted, drawn, and represented, to have and to hold the same unto the said Hector Berrenger De Beaufain, Esq., his heirs and assignees for ever. *Item*, I give, devise, and bequeath unto the Reverend Mr. Heywood, his picture, portraiture, or effigies, by me the said testator, painted, drawn, and represented as aforesaid, to

have and to hold the same unto the said John Heywood, his heirs and assignees for ever. *Item*, I give, devise, and bequeath unto my son Alexander Gordon, my own picture, together with all and singular the paintings, views, and other the representations by me the said testator, painted, drawn, and represented, to have and to hold the same, and each and any of them, unto my said son, his heirs and assignees for ever."

Then, after dealing with his silver watch, gold ring, and his lot of land in Ansonborough, with all the houses erected on it, in about as many words; he next disposes of "all and singular other my pictures hereinbefore not particularly given;" and so, relieved of the trouble of such secondary matters, he comes to the grand prize on which his own fame, the fortunes of his heirs, and the enlightenment of the world at large, are to depend, and thus proceeds:

"*Item*, it is my express will and desire, and I do hereby order and direct, that my said son shall, as conveniently as may be, cause to be printed and published my book now remaining in manuscript, and titled 'A Critical Essay towards the illustrating the History and Chronology of the Egyptians and other most Ancient Nations, from the earliest ages on record till the times of Alexander the Great,' &c., &c. *Item*, I give, devise, and bequeath unto my said son two-thirds parts, the whole in three equal parts to be divided, of all and every such sum and sums of money that shall arise and accrue from the printing and publication of the said book, to have and to hold the same unto my said son, his heirs and assignees for ever. *Item*, I give, devise, and bequeath unto my said daughter, Frances Charlotte Gordon, the remaining third part or share of all and singular such sum and sums of money so arising and accruing from the printing and publishing of the said book, to have and to hold the same unto my said daughter, her heirs and assignees."

Happily for his heirs, this precious bequest was accompanied with more easily realisable property. We will hope that both Alexander and Frances Charlotte Gordon estimated with all filial reverence the invaluable Critical Essay; but it is to be feared that, with the death of the author, its only probable reader within the bounds of the Province, or indeed of the whole Colonial settlements of North America, had passed away. The circumstances and tastes of a young Colony were not encouraging, whatever may have been the zeal which animated the inheritors of this unique bequest. The convenient time

for printing and publishing never did arrive ; and so Alexander Gordon, junior, never received his two-thirds, nor Frances Charlotte her one-third part, of all and singular the sums of money which the sanguine Antiquary persuaded himself were to accrue from the sale of his grand solution of the Egyptian mystery.

To survivors belonging to a century which has shared in the labours and elucidations of Dr. Thomas Young, Champollion, and many later Egyptologists, by whom the Rosetta Stone, and subsequent discoveries of inscribed tablets and papyri, have been turned to such good account, the unpublished "Critical Essay" of the author of the *Itinerarium Septentrionale* would be of little enough value now. But it is otherwise with his own portrait. As a work of art, its merit is possibly not to be ranked very high ; and, now that his heirs and assignees have all passed away, if it still exists, it is probably consigned to some lumber room, or deserted attic, from whence—if it could but be ferreted out,—the lucky discoverer might rescue it almost for the trouble of taking it away ; and yet, to not a few it would be a prize of rare worth. Doubtless it bears its own means of identification : the author's folios, perchance, duly labelled with the titles of his literary fame ; or—in evidence of the tastes of a later era,—an Egyptian mummy, or other symbol of those mystic studies which beguiled him from his first love. By some such feature the old canvas may yet be identified, and so introduce to us the veritable effigies and handiwork of Alexander Gordon, the quondam Roman Antiquary, and Registrar of the Province of Carolina in those good old times when Geo. 3^d II. was King. Since we have been fortunate enough to recover his will, with its characteristic bequests, after its destruction had been assumed as unquestionably involved in General Sherman's sack of Columbus, the capital of the old State, and the burning of all the records of elder generations treasured there, we may still indulge the hope that some lucky chance will yet restore to the State of South Carolina the portrait of its old Registrar, around whom a fresh halo of glory has gathered since the times when he transacted, unheeded, the routine duties of his office, as a citizen of Charleston ; and, in accordance with his own directions, was there committed to the dust, "decently, and in a Christian-like manner."

LEAVES THEY HAVE TOUCHED ;
BEING A REVIEW OF SOME HISTORICAL AUTOGRAPHS.

BY HENRY SCADDING, D.D.

ADDENDA.

As addenda to the series entitled "Leaves they have touched," I desire to transcribe and put on record here, several autograph MS. relics which have come into my hands since the papers thus entitled were read to the Canadian Institute. I should have preferred to have introduced them in their proper places.

I. (1.) The following letter from Lord Dorchester to Sir George Yonge, transcribed from the original, dated at Quebec, 22nd June, 1790, belongs to the Canadian series. Lord Dorchester is more generally known among us as Sir Guy Carleton, the companion of Wolfe at the taking of Quebec, and the defender of Quebec, at the time of Arnold and Montgomery's attack in 1775. Sir George Yonge was "Secretary at War" in 1790. He is the personage from whom our YONGE STREET has its name—a communication opened, in the first instance, with a view to military operations, no less than commercial. A particle of warmth may perhaps be detected in Lord Dorchester's letter. He had applied for a commission in the Guards for his son, Guy Carleton, but a delay of four years was beginning to try his patience. He possibly felt that his services deserved more prompt attention.

"Sir," Lord Dorchester proceeds, "As I apprehend that many importunities have retarded the success of my application, about four years since, for an Ensigncy in the Guards for my eldest son Guy ; and, fearing lest the same reasons may still continue, while he is advancing considerably beyond the age judged necessary for entering into the military profession, I am to request you will take a proper opportunity of laying my petition before the King, that He would be graciously pleased (till such time as it may suit His Majesty's convenience and good pleasure to honour him with a commission in His Guards) to give him a Cornetcy in any of His Regiments in

Great Britain. I am, Sir, with regard, your most obedient and most humble servant, DORCHESTER." Guy probably never obtained the Cornetcy. He died unmarried in 1793, aged just 20. Nor did his next brother Thomas, who died in the following year, at exactly the same age. But Christopher, the third son, born in 1775, was a Lieutenant-Colonel in the army, and was father of Arthur Henry, the second Baron Dorchester, who died unmarried in 1826, when the barony descended to his cousin Guy, born in 1811. Lord Dorchester, the writer of the letter just given, died November 10, 1805.

(2.) I next transcribe a document possessing a two-fold interest as bearing the autographs of GEORGE IV. and LORD PALMERSTON. It is to be placed in the Canadian series, inasmuch as it consists of a royal warrant, authorizing magistrates at "York, Upper Canada," (*hodie* TORONTO), to enlist men for service in the regular army of Great Britain. I suppose at the present date such a warrant would be locally held to infringe on the principle of responsible government. Its date is 1828. It runs as follows: "GEORGE R.—It being expedient that the provisions contained in the 117th clause of the Act, passed in the 7th and 8th years of Our reign, for the punishment of mutiny and desertion be duly carried into effect, We do hereby authorize and appoint you to enlist and attest, in our Colony at York, Upper Canada, any soldiers or others, desirous of enlisting, or re-enlisting into Our service, and to administer such oaths as are directed and required to be administered in that behalf, by Justices of the Peace in Our United Kingdom, in relation to the enlisting and re-enlisting of soldiers; and every person so enlisted or re-enlisted by you, shall be deemed and taken to be so enlisted or re-enlisted under the provision of any Act in force in relation to the enlisting of soldiers, and for the punishment of mutiny and desertion, in like manner, in every respect, and as fully and effectually, to all intents and purposes, as if such oath had been administered and such attestation had been made, and such enlisting and re-enlisting had taken place before a Justice of Peace of the United Kingdom. Given at Our Court at Windsor, this third day of September, in the eighth year of Our reign. By His Majesty's Command, PALMERSTON. To the Justices of the Peace, and other Civil Magistrates for the time being, at York, Upper Canada."

The name of Palmerston, when Foreign Secretary, especially during the period 1835-41, was regarded with a good deal of awe on the

continent of Europe. Mr. Ashley quotes a German couplet to the effect that—

“ If the devil have a son,
Then be sure it's Palmerston.”

And Borrow, in the tenth chapter of his “Bible in Spain,” describes in an amusing manner the reverence shown on a certain occasion in that country to the autograph signature of the English Minister. “Señor Nacional,” said Borrow to the civic guard on entering the gate of the town of Jaraicejo, “You must know that I am an English gentleman, travelling in this country for my pleasure. I bear a passport which, on inspecting, you will find to be perfectly regular; it was given me by the great Lord Palmerston, Minister of England, whom you, of course, have heard of here; at the bottom you will see his own handwriting, look at it and rejoice—perhaps you will never have another opportunity. As I put unbounded confidence in the honour of every gentleman,” Borrow continued, “I leave the passport in your hands, whilst I repair to the posada to refresh myself.” The national guard, on bringing back the document, makes many inquiries about Palmerston, whom he takes to be a great military personage; he asks whether he was likely to assume personally the command of the British Legion in Spain, to which Borrow replies, “No; but he has sent over to head the fighting men, a friend of his, who is thought to be nearly as much versed in military matters as himself.” After having his curiosity satisfied on this and some other points, the guard asks again to see the signature of the “Caballero Balmerston.” “I showed him the signature,” Borrow says, “which he looked upon with a profound reverence, uncovering his head for a moment: we then embraced and parted.”

II. (1.) To the group in the British series, containing relics of Mrs. Piozzi, Garrick, and Dr. Parr, I now subjoin what was long with me a desideratum, a fragment in the handwriting of Dr. Samuel Johnson. It consists of a brief request to Mr. Cadell to have two pairs of two of the Doctor's early political pamphlets half bound and sent to him speedily. These were brochures, briefly spoken of here as the “False Alarm” and the “Falkland Islands,” written to order for the ministry of the day, and supporting, unhappily, the weaker side of the several questions involved. Thus the message transcribed from the original runs: “Mr. Johnson begs the favour of Mr. Cadell that he will send to his Binder two *False Alarms*, and two

Falkland Islands, one of each to be bound together in half-binding. Let it be done as soon as it can."

In a conversation between Boswell and Johnson, given in chapter v. of the "Life," these pamphlets are spoken of together in immediate association. "We talked," Boswell says, "of his two political pamphlets, the 'False Alarm,' and 'Thoughts concerning Falkland's Islands.'" JOHNSON: "Well, Sir, which of them did you think the best?" BOSWELL: "I liked the second best." JOHNSON: "Why, Sir, I liked the first best; and Beattie liked the first best. Sir, there is a subtlety of disquisition in the first that is worth all the fire of the second." BOSWELL: "Pray, Sir, is it true that Lord North paid you a visit, and that you got two hundred a year in addition to your pension?" JOHNSON: "No, Sir. Except what I had from the bookseller, I did not get a farthing by them. And between you and me, I believe Lord North is no friend to me." BOSWELL: "How so, Sir." JOHNSON: "Why, Sir, you cannot account for the fancies of men."

Mrs. Piozzi, in her *Reminiscences of Johnson*, remarks of the "False Alarm:" "This, his first and favourite pamphlet, was written at our house between eight o'clock on Wednesday night and twelve o'clock on Thursday night. We read it to Mr. Thrale, when he came home very late from the House of Commons."

The "False Alarm" was connected with the repeated expulsion of Wilkes from the House, it seeming to be implied by that action of the majority, that one expulsion was equivalent to total exclusion. The rejoinder which appeared to the "False Alarm" was supposed to be from the pen of Wilkes himself. "The Thoughts concerning Falkland's Island" had reference to a threatened war with Spain, arising out of the occupation by England of the island or islands named, off the south coast of Patagonia. (2.) Accompanying my relic of Johnson is a transcription of a letter of Johnson's in the handwriting of Malone, the editor of several successive issues of Boswell's *Life of Johnson*. (3.) My Johnsonian memorial circle is rounded off by a copy of Hamilton, Balfour and Neill's beautiful edition (Edinburg, 1758) of Terence, which has the autograph of Wilkes inscribed on its title-page.

(4.) A note in the handwriting of Sir Walter Scott, while yet "Walter Scott, Esq., Advocate." It is a frank permission sent to a musical composer to set some of his poetry to music, and to dedicate

a certain piece to him. He speaks of himself as "a professor of the art of poetry," and he thinks it would be churlish in him to withhold such favours from an amateur of the sister art of music. The letter is dated from Ashestiel, in Stirlingshire, almost as famous as Abbotsford, as the residence of Scott from 1804 to 1812, where he wrote his "Lady of the Lake," the "Lord of the Isles," and many of the compositions now included in his miscellaneous works. "Sir,—I am favoured with your letter, and make you most heartily welcome to set and publish (so far as I am concerned) any part of the poetry I have written. I am very sensible of your delicacy and politeness in making the application, which I have made it a general rule never to refuse, as I should hold it very churlish of a professor of the art of poetry to withhold any contribution in his power from an amateur of music. Not knowing exactly how to address you, I begged Mr. John Ballantyne to find some way of sending you a note, requesting my name might be put down for three copies of your music. Wishing you all the success your liberality merits, I am, sir, your obedient servant, WALTER SCOTT." Dated from "Ashestiel, 2nd September," with this postscript added: "I need not add, I will consider myself honoured by your intention of inscribing the music to me of the Hymn, &c." Addressed on the outer cover, "G. F. Graham, Esq., care of Mr. Hamilton, Music Seller, North Bridge." The Hymn was doubtless that of the "Hebrew Maid," beginning—

"When Israel, of the Lord beloved,
Out from the land of bondage came."

George Farquhar Graham was the author of an *Essay on Musical Composition*, Edin., 1838; *Songs of Scotland*, 1858; and *Articles—Music, Organ, &c.*, in eighth edition of *Encyclopædia Britannica*, besides other books on general literature.

Ashestiel was situated at a considerable distance from a place of worship, and it was Scott's practice, Lockhart tell us, chap. xvii., on Sundays to read the church service, and then "he usually walked with his whole family, dogs included, to some favourite spot at a considerable distance from the house—most frequently the ruined tower of Elibank—and there dined with them in the open air on a basket of cold provisions, mixing his wine with the water of the brook, beside which they all were grouped around him on the turf; and here," it is added, "or at home, if the weather kept them from their ramble, his Sunday talk was just such a series of biblical lessons

as that which we have preserved for the permanent use of rising generations, in his Tales of a Grandfather on the early history of Scotland."

III. To the European or Continental MS. relics described in subdivision III. of "Leaves they have Touched," I now add a document bearing the autograph signature of the poet Goethe, in his capacity as one of the Commissioners appointed for a special purpose at Weimar in 1790. It is a paper of some length, relating to a deduction to be made in moneys due to the public treasury from the estate of one defunct. It appears to be a quaint specimen of official red-tapeism, and it reads as follows, as kindly translated for me by Mr. Vander Smissee: "The Princely Amt und Unter Steuer Directorium (Board of Assessors) will see from the annexed copy of Document in what manner the heirs-at-law of the late District Commissioner, Aulic Councillor Lenz of Nürnberg have offered a compromise of 30 p. c. as a final settlement of the Ilmenau assessment claim against the Lenz estate, amounting to 590 R. 4 k. The aforesaid offer having been accepted on behalf of the Commissioners in a reply transmitted this day to the Councillor of Legation at Nürnberg aforesaid, and it being still required that the calculation in this matter should be made up as soon as possible, Therefore the Princely Amt und Unter Steuer Directorium is heroby directed by the Commissioners to supply what is required in this case, and thus to finally settle the matter in question, and to write off the balance to Profit and Loss account. We herewith also return to you the Assessment documents sent in with your Report of 15th April a. c., as enclosure sub +. Given at Weimar, the 29th June, 1790. The Commissioners appointed for the Inspection of the Assessment Department of Ilmenau of the Principality of Saxony, J. W. v. GOETHE, C. C. VOIGT."

IV. My fourth subdivision embraced MS. relics of eminent Oxford and Cambridge men. These I now supplement by the following, transcribed from the originals; all of them, however, from the hands of Cambridge men. (1.) A note of the present Astronomer Royal, George Biddell Airy, formerly Plumian Professor of Astronomy at Cambridge, to Mr. G. V. Fowler, who has been communicating with him on some new method of correcting the compass on board of iron ships: "Sir," writes the Astronomer Royal from the "Royal Observatory, Greenwich, London, S.E., May 18th, 1864," "If you

will have the kindness to send me any details which you think fit, on your proposed method of correcting the compasses of iron ships, I shall be glad to consider them, and as opportunity serves, will report to you on them. I presume that I am not to understand literally, your expression, 'needles can be and are *insulated* from the local influence of iron ships and ships' iron'? I am, sir, your obedient servant, G. B. AIRY." (2.) Two notes from the hand of Sir John F. W. Herschel, author of the well-known "Discourse on Natural Philosophy," and formerly Fellow of St. John's College. Both of them are characteristic. One is addressed to some gentleman who has asked him to join an expedition to a cavern at Maidstone, where the remains of hyenas are found. His occupations and engagements oblige him to decline. In like manner he was not able on Friday last to attend a meeting of the Geological Society; and that evening he was to be by appointment with Mr. Sande at the Observatory of Camden Hill, where he expects they will make a night of it. The other is addressed to Professor Faraday in 1827. It contains a scheme for a series of scientific experiments to be made by him, and reported on periodically. In this note, the Observatory at Slough is mentioned, from which Herschel desires to be as little absent as possible, so long as the state of the moon permits him to continue his observations. (a) "2nd June, 1827.—Dear Sir: I am sorry I can't go on the very interesting expedition to the Hyeniferous Cavern at Maidstone. I am no less sorry I could not attend at the Geological Society on Friday; and to-night am going to make the second observation at the Observatory at Camden Hill, according to promise. Mr. Sande made the first last night, which decided a point. I suppose we shall make a night of it. Yours truly, J. F. W. HERSCHEL." (b) "Devonshire Street, Tuesday, November 6th, 1827. Dear Sir: I received yesterday, too late to allow me an opportunity of seeing you before your leaving town, your note dated the 3rd. I am glad to hear the furnace and other preparations are in a state of forwardness, and when you return, hope the expedition will commence. I directed Mr. Hudson to forward to you the report of the third experiment in the Glass-house; that and the committee books will put you in possession of all that has been done, (together with your own recollection of what has passed under your own eyes.) On Saturday, the 10th, my astronomical pursuits call me to Slough, whence I am to be desirous to be as little absent as possible, so long

as the state of the moon permits me to continue my observations. I will gladly, however, meet you and Mr. Dollond any morning, provided you arrange your times early enough to admit of my return to Slough before dusk, and will give me, if possible, sufficient notice, and the choice of two days. With regard to the train of experiments you may think it necessary to engage in, Mr. Dollond, I am sure, as well as myself, feel every disposition to defer to your superior chemical knowledge, and wish to be as little a clog on your researches as possible. The essential point consists in preserving a very accurate detail of our proceedings, and making (as we are bound to do) a full report of them; and perhaps it might be as well to meet periodically (*in our capacity of a sub-committee*) at stated, or at least preconcerted days, in order to preserve a strict formality in all we do. What say you to the following sketch: 1. Mr. Dollond, Chairman; Mr. Faraday, Journalist and Treasurer; Mr. Herschel, Secretary,—of the sub-committee for the following year. 2. Sub-committee to hold regular meetings on the (Tuesday?) next immediately adjacent to, or on the day of every full moon (at o'clock), except during the months of _____ in the summer vacation, and intermediate meetings when necessary. 3. A regular journal to be kept of all the experiments made and of all the operations made in the apparatus, by the Journalist. 4. A book to be kept in which any one may enter any suggestion of an experiment to be considered by the sub-committee. 5. The Treasurer to keep an account of all expenses. 6. The business of the sub-committee at meetings to be arranged as follows: (1.) Minutes of last meeting. (2.) Reconsideration thereof and confirmation. (3.) Journal of the last meeting to be read. (4.) Journal to be ordered to be entered on the Minutes (or regarded as part of them, to avoid trouble of copying—though perhaps a duplicate may be desirable in prudence). (5.) Treasurer's account to be audited for the past month. (6.) Results of experiments to be discussed. (7.) Suggestions to be read, and plans of future experiments to be considered after. The sub-committee to make three reports—one at Christmas, one after Easter, and one annual, at the Council, after the meeting of the Society in November. If you approve this plan, and it also meets Mr. Dollond's approbation, the sooner we act on it the better. Yours truly, J. F. W. HERSCHEL." (3.) In the fourth subdivision of "Leaves they have Touched," I gave some account of the Rev. Charles Simeon, Senior Fellow of King's College, Cambridge, in 1835,

with an autograph relic. I now subjoin another of the same memorable person. It is a letter addressed by him in 1819 to Mr. Charles Grant, at a later period Colonial Minister, well-known to Canadians as Lord Glenelg. In it he speaks of the new College in Bengal, *i.e.*, Bishop's College, Calcutta, and he says that if a Head for it is wanted, he has in his pocket one that would exactly suit—Mr. James Scholefield, his assistant in Trinity Church, Cambridge; he is sure that he would prove a second Dealtry, *i.e.*, equal to the Thomas Dealtry, whom he (Mr. Simeon) had been instrumental in sending out to be Bishop of Madras. Mr. Scholefield became afterwards Regius Professor of Greek in the University, and never went out to India. Mr. Simeon's letter reads as follows: "K. C. Camb., Aug. 20th, 1819.—My Dear Sir: The new College in Bengal is of great moment, and the Bishop's letter about it is a good letter. If you have the means of recommending a Head, I have a Dealtry in my pocket for you—a man every way qualified by piety, diligence, and the highest attainments, quite *laden* with University honours, and not obnoxious on account of his Religion either. It is no other than my Assistant, Mr. Scholefield. I have sent them a Martyn and a Thomason, and I will now give them precisely what you will understand, *in all its bearings*, a Dealtry. Are you likely to want more than one Chaplain? Most affectionately yours, C. SIMEON." Addressed outside to "Charles Grant, Esq., India House, London."

I close this appendix by briefly describing two manuscript copies of the Four Gospels, of an early date, which I class among my "Leaves they have Touched," because, although they are neither of them to be identified as the production or former property of any personage of note, the imagination can legitimately conceive that they have each of them come under the eye and been turned over by the hand of many an eminent man, during the four hundred and six hundred years of their respective existences. Both are manuscripts on vellum. (1.) The first is a manuscript of the fourteenth Century, of the Four Gospels in Latin. Out of reverence, doubtless, some former possessor has had it bound in costly olive-coloured morocco, whereby its margins have been somewhat curtailed—the edges having been cut for the purpose of being gilt. I should have preferred seeing it in its original cover of oak board, limp parchment, or whatever else it may have been. It is written in double columns in the usual black letter. There is no distinction of chapter and verse; but

sections or paragraphs are numerous, and each begins with a conspicuous rubricated letter. The first letter of each Gospel is of extra size and length. Space is economized and labour saved to the greatest possible extent by abbreviations throughout, as in the early printed black letter books, which closely imitated the manuscripts. Slight marks over the words, which I do not attempt to reproduce, are made to denote contractions. Jesus is *ihc*, Deus is *ds*, est is *e*, generatio is *gnacio*, etc. The Latin is that of the Vulgate, but the orthography is mediæval and non-classic. A superfluous *h* is prefixed to some words. Thus we have *habiit mœrens*, he went away sorrowful, for *abiit mœrens*; while, on the other hand, a customary *h* is removed, making *habuit* to be *abuit*, &c. **Mihi* is *michi*. *Habundanti* for *abundanti* recalls Abbot Wheathampstead's frequent allusion to his own name at St. Albans—*Valles habundabunt frumento*. *Dies hulcionis* for *dies ultionis*, day of vengeance, has a curious look. An *h* appears unexpectedly in the middle of a word, as in *introhibunt* for *introibunt*, reminding one of the "abominable" of Shakspeare's *Holofernes*. For *admirabantur* I observe *ammirabantur*. Prefixed to each Gospel is a short account of the author. Some marginal notes appear in a later hand, written in minute and neat characters. These consist of slight corrections and omissions. For convenience, another hand has noted the chapters; and a recent hand has numbered the folios on the right hand side (ccxi.) In the tenth chapter of St. Mark we have an example of homoioteleuton—as it is called—a common error or source of error in manuscripts. The monkish scribe has given us "*da nobis ut unus ad dexteram tuam, et alius ad sinistram tuam sedeamus in gloriâ tuâ. Jesus autem ad eis: calicem quidem quem ego bibo, bibetis,*" &c. The corrector has here properly written in the margin, to be inserted between *eis* and *calicem*, the following words, which were omitted: "*Nescitis quid petatis: potestis bibere calicem quem ego bibo, aut baptismo quo ego baptizor, baptizari: et illi dixerunt ei Possumus: Jesus autem ait eis.*" The last "*Jesus autem ait eis*" caught the eye of the copyist, instead of the preceding identical expression, and caused the omission. In like careless fashion in St. Matthew, ch. 13, where the text runs: "*alia autem ceciderunt in petrosa, ubi non habebant terram multam, et continuo exorta sunt, quia non habebant altitudinem terræ, sole autem orto æstuaverunt; et quia non habebant radicem, aruerunt,*" the copyist has left out, and the corrector has

marked for insertion the words, "quia non habebant altitudinem terre; sole autem orto aestuerunt et"—the second "quia non habebant" having led the eye astray. Copying slowly and mechanically day after day, the scribe doubtless became listless now and then. As to the age of the volume, Messrs. Ellis and Green, the well-known English and Foreign booksellers, of 33 King Street, Covent Garden, experts in respect of such matters, state that, "in ninety-nine cases out of a hundred, the date of a MS. can be judged with certainty from the character of the handwriting, the formation of certain letters, the use of contractions, and various other points familiar to any one who sees many such specimens. From such data we have no hesitation in repeating that the MS. in question [*i.e.*, The Quatuor Evangelia now before us] was beyond doubt written before 1400." "Repeating" refers to the statement made by Messrs. Ellis and Green in their advertisement of this MS. in the *Saturday Review*. Supposing, then, its writing to have taken place about midway in the fourteenth century, it is within the bounds of possibility that this identical copy of the Four Gospels may have been used by Wycliffe while engaged in his translation of the Scriptures, or that its leaves may have been those from which Robert Langland transcribed the Latin texts, which appear every here and there in the Vision and Creed of Piers Ploughman. On the first folio are memoranda of Libraries to which this MS. has in its days belonged, or been presented. One of them was that of a monastery of St. Andrew, but the name of the place where, I have not been able satisfactorily to decipher.

(2.) I next describe an ancient MS. copy of the Four Gospels in Greek. It is a small thick quarto, five by six inches. The covers are of wood, perhaps cedar or cypress, very thick but light. A thin leather is stretched over the wood. A number of holes pierce both substances; once the receptacles of pins or rivets which, at the four corners, fastened to the cover metal bosses, holding, it may be, each a precious stone; whilst in the middle of each cover there has evidently been an ornamental figure; that on the first, appears, from traces left, to have been a crucifix. The volume was originally fastened, not by clasps, but, by strings of which there are remains inside: on the edge of the left hand cover there are metal pins to which the strings were looped or tied. The wood of the right-hand cover is somewhat decayed towards the top. The leaves of the MS.

are a fine vellum. Small bits of leather glued on so as to project a little, facilitate the finding of the beginning of each Gospel, and one or two other places often wanted, as I suppose. Each book has at its commencement a well-executed illumination, here and there, however, now slightly abraded. That at the beginning of St. Matthew is a broad frame of arabesques in purple, vermilion, and gold, surrounding the title: at each corner a miniature head, all of them more or less damaged. That at the beginning of St. Mark is a similar border round the title, in good preservation, but without miniatures. At the beginning of St. Luke, it is not a frame for the title, but a large compartment above it, fitted with arabesques. And St. John's Gospel is distinguished by a rich frame-work of arabesques surrounding an oval in which is a solitary head, probably intended for that of Christ. The titles themselves are: τὸ κατὰ ματθαῖον ἄγιον εὐαγγέλιον: τὸ κατὰ μάρκων ἄγιον καὶ σεπτὸν εὐαγγέλιον: τὸ κατὰ λουκᾶν ἄγιον εὐαγγέλιον: τὸ κατὰ ἰωάννην ἄγιον εὐαγγέλιον. (The rather unusual word *σεπτὸν* applied to St. Mark's Gospel means august, venerable: its initial sigma is given as a C, an antique form of sigma, appearing also in other places throughout the MS.) The initial letter of St. Matthew is a large quaintly-formed beta in purple and gold: that which begins St. Mark is a large alpha in the same style. St. Luke's is an epsilon, in which the middle limb is an arm and hand, the two fore-fingers extended; and St. John's is also an illuminated epsilon, but of a different and quite arbitrary design. Each of the titles of the four books was once bright with gold; and certain small capitals, conspicuous in every page, were all originally gilded. The handwriting of the text throughout is very beautiful; minute and even and distinct, with the accents, breathings, and marks of contraction very clear. Proper names are not distinguished by capitals. The abbreviations and conjoined letters are numerous. *θεός* appears as *θσ*: *Ἰησοῦς* as *ισ*: *Χριστός* as *χσ*, each looking strangely insignificant. *Ἀνθρωπος* is *ἄνοσ*. The final sigma is *σ*, not *ς*. The omega is like an 8 laid sideways. The *ν* looks like a mutilated *μ*. The iotas of the dative are not subscribed, but placed at the end of the word. The small conspicuous capitals, above mentioned, were probably for purposes of ready reference, like the numerals attached to our modern "verses." They form the beginning of certain lines in every page, but are not placed at regular intervals. Sometimes the conspicuous capital is the first letter, not of a word, but of a syllable belonging to a word in the preceding line.

The Gospels of St. Mark, St. Luke, and St. John are each preceded by a table of *κεφάλαια* or subjects, written by the original hand, and numbered in the Greek way; and the numerals, with the *κεφάλαια* added, are repeated afterwards at the top of the pages of the Gospels. From the minuteness of the Greek, and the many contractions, it is not easy quickly to identify a particular passage, when it is desired to compare one with a printed copy of the Greek text. These *κεφάλαια* are then found to be of considerable use. The table of *κεφάλαια* for St. Matthew has been unfortunately lost or worn out; but the beginning of the Gospel itself was thus probably preserved intact. The ink of the original scribe has retained its colour throughout very fairly. On the margins are symbols and numerical abbreviations, for ecclesiastical purposes, corresponding with tables at the end; many of these are in a later hand and carelessly written; as also are memoranda of contents written at the top and bottom of several of the pages. The ink of these additions has become very faint.

The MS. before us appears to belong to what the critics style the Constantinopolitan recension. Thus it has in Mark V. at v. 1, *ἦλθον* for *ἦλθεν*; at v. 2, *ἐξελεύσονται αὐτοῖς*, not *ἐξελεύσονται αὐτοῦ*, and *ἀπέστησαν*, not *ὑπέστησαν*; in v. 5, *ὄρεσι καὶ ἐν τοῖς μνημασι*, not *μνημασι καὶ ἐν τοῖς ὄρεσι*, &c. It has the twenty-first chapter of St. John, and the sixteenth of St. Mark from v. 9 onwards; but originally it had not the first part of the eighth chapter of St. John. The passage is added, in another hand, in the margin. The whole of the space usually vacant at the top of the page is filled with this; also the right-hand margin and a portion of the bottom of the page. In the narrative of the cure of the impotent man in St. John we have another example of homoioteleuton. Verse twelve of the received text is left out, but by accident. It is copied by another hand in the margin, as an omission, four dots in the text indicating the place where it is to be inserted. The passage ends with the word *περιπατεῖ*; and it will be observed that v. 11 ended with the same word: hence the copyist's error. At the end of St. John is a *πίναξ ἀκριβῆς*, an "accurate table," showing apparently, in a technical and most abbreviated way, the beginnings and endings of the Gospels for the Sundays throughout the year in the Greek Church. Then follows a *Μηνολόγιον* or ecclesiastical Calendar naming the saint or saintly event commemorated each day of the month throughout the year, with the

proper *περιχοπαι* or lessons indicated by conventional abbreviations to which correspond similar signs on the margin, and at the top and bottom of the pages in the preceding MS. The Calendar begins with Sep 1, and the personage named for commemoration on that day is Saint Simeon Stylites. Both in the *πίναξ* and the *μυρολόγιον* the initial letters of numerous words seem to have been written in red ink which has now become very faint.

London experts assure us that the copy of the Four Gospels before us was written prior to 1200. We might easily conceive it to have been written a century earlier, so closely does it correspond in character with *fac-simile* specimens which I have seen of MSS. in the British Museum, said to be of the eleventh century. Not knowing its history, it is impossible to say with any definiteness whose hands may have turned over its pages. It is a chronological possibility that those of Thomas à Beckett may have done so. Or, a few years later, it may have been brought home from the Holy Land, bright and fresh, by some bibliophile pilgrim in the retinue of Hubert Fitz-Walter, Bishop of Salisbury, companion of Richard Cœur de Lion in the Third Crusade. More probably, however, some more recent English traveller, some tourist to Mount Athos—some Curzon, bent on exploring the neglected treasures of the twenty-one monasteries of the Holy Mountain—purchased it of a needy Abbot there, and brought it to England with other literary spoil. In 1833, Mr. Curzon (afterwards Lord de la Zouche) found numerous ancient MS. copies of the Gospels in the monasteries of Egypt, Syria, and the Ægean, and brought many of them with him to England. And since his visit, other travellers have gone over the same ground, and made similar forays. The latest discoverer of eminence in fields of this kind is Professor Tischendorf, of Leipsic, who first in 1844 lighted on a part, and in 1857 recovered the whole, of a MS. containing the Old Testament in Greek, and the entire New Testament, all written, it is confidently held, in the early half of the fourth century. The scene of Tischendorf's fortunate find was the Convent of St. Catherine on Mount Sinai. The MS. thus rescued is now known as the Codex Sinaiticus, and is in the possession of the Emperor of Russia, who has had copies of it made in *fac-simile*, and in ordinary Greek type. In 1833, such relics of bygone centuries were not universally appreciated among the monasteries of the East. This is Curzon's description of a sight which met his eye in the dilapidated

library of Pantocratoras on Mount Athos: "By the dim light which streamed through the opening of an iron door in the wall of the ruined tower, I saw above a hundred ancient manuscripts lying among the rubbish which had fallen from the upper floor, which was ruinous, and had in great part given way. Some of these manuscripts," the writer says, "seemed quite entire—fine large folios; but the monks said they were unapproachable, for that floor also on which they lay was unsafe, the beams below being rotten from the wet and rain which came in through the roof. Here was a trap ready set and baited for a bibliographical antiquary. I peeped at the old manuscripts, looked particularly at one or two that were lying in the middle of the floor, and could hardly resist the temptation. I advanced cautiously along the boards, keeping close to the wall, whilst every now and then a dull cracking noise warned me of my danger, but I tried each board by stamping upon it with my foot before I ventured my weight upon it. At last, when I dared go no farther, I made them bring me a long stick, with which I fished two or three fine manuscripts, and poked them along towards the door. When I had safely landed them, I examined them more at my ease, but found that the rain had washed the outer leaves quite clean; the pages were stuck tight together into a solid mass, and when I attempted to open them they broke short off in square bits like a biscuit. One fine volume, a large folio in double columns, of most venerable antiquity, particularly grieved me. I do not know how many more manuscripts there might be under the piles of rubbish. Perhaps some of them might still be legible, but without assistance and time I could not clean out the ruins that had fallen from above, and I was unable to save even a scrap from this general tomb of a whole race of books." In other quarters Mr. Curzon was much more successful.

Although, as an authority, the manuscript which I have described adds nothing to the critical apparatus of the New Testament, I have ventured to have stamped upon the morocco case in which I have placed it, the words *CODEX TORONTONENSIS*, because, as I suppose, there is no other example of an early manuscript copy of the Four Gospels in the original Greek, in Toronto.

(3.) Lastly, for the sake of including a genuine specimen of a portion of the Scriptures in Hebrew, as well as in Latin and Greek, I add and describe now a roll of the Book of Esther, beautifully and

boldly written, without points, on five sheets of asses' skin, beautifully prepared, so as to present a white enamelled surface. Its length is $9\frac{1}{2}$ feet, and its breadth $11\frac{1}{4}$ inches. Its matter is arranged, not exactly in columns, but, in eighteen large pages or "doors" as they were called from their shape. One end of the MS. is lined with green silk and provided with ribbons of the same colour; but the central wooden cylinder, with the projecting umbilicus or boss at either end, is wanting. It is a document of some antiquity, and has doubtless been unrolled by the hands of eminent rabbis, and often read by them in synagogues on the Continent of Europe, in the ears of attentive assemblages of old and young. It may be added that the Book of Esther is sometimes called the Megillah or *ROLL par excellence*. It was sometimes prepared in this separate form, for special use at the Feast of Purim, when it is annually read through.



SYNOPSIS OF THE FLORA OF THE VALLEY OF
THE ST. LAWRENCE AND GREAT LAKES,
WITH DESCRIPTIONS OF THE RARER PLANTS.

BY JOHN MACOUN, M.A., *Botanist to the Geological Survey.*

AND

JOHN GIBSON, B.A., F.G.S., F.B.S.E.

(Continued from page 66.)

SISYMBRIUM, L. Hedge Mustard.

S. officinale, Scopoli. Official Hedge Mustard.

Naturalized from Europe. Waste places, roadsides, and in the vicinity of barn-yards. Common at Belleville and Owen Sound (Macoun). Waste places everywhere, London, Ont. (Saunders). Common near Prescott (Billings). Vicinity of Montreal (Brunet). Roadsides, Hamilton, Ont. (Logie). Malden, Ont. (MacLagan). Waste places, Bayfield, County Huron, Ont. (Gibson).

S. Sophia, L. Flaxweed.

Introduced from Europe. Waste places. Borders of fences near Quebec (Brunet). Montreal (MacLagan, Mrs. Percival). East Street, Prescott (Billings).

S. canescens, Nutt. Sickie-pod. Tansy Mustard.

Indigenous. Dry, rocky ground. Montreal, St. Helen's Island (MacLagan). Little Current, Georgian Bay (Macoun). Whisky Island, Lake Huron (Dr. Bell). North shore of Lake Superior (Agassiz). Saskatchewan plains (Bourgeau). Fort Edmonton, on the Saskatchewan; Mosquito Prairie, near Fort St. John, Peace River; Telegraph Trail, Upper British Columbia (Macoun). Arctic America (Hooker).

BRASSICA, Tourn. True Mustard.

B. sinapistrum, Boissier. Wild Mustard.

Introduced from Europe. Waste places, roadsides, and cultivated fields. West to Lake Superior (Macoun).

B. alba, Boissier. White Mustard.

Introduced from Europe. In cultivated grounds. New Brunswick (Dr. Fowler). Vicinity of Quebec (Brunet).

B. nigra, Boissier. Black Mustard.

Introduced from Europe. In cultivated grounds, around barns and manure heaps. Around old barns in the Counties of Prince Edward and Hastings (Macoun). Gardens and waste places, Quebec (Brunet). New Brunswick (Dr. Fowler). Prescott (Provancher).

DRABA, L. Whitlow Grass.

D. alpina, L. Alpine Whitlow Grass.

Indigenous. Dwarf, 2'-4' high; rather rigid; scapes naked, mostly somewhat hirsute; leaves spatulate-obovate or spatulate-lanceolate, nearly veinless, more or less pilose, with branching hairs; petals yellow, more than twice the length of the calyx; silicles glabrous (in our specimens) or pubescent, somewhat corymboid, oblong-elliptical; styles very short.

Rocky coast of Labrador (Brunet). Shore of Sturgeon Lake, Dawson route (Macoun). Rocky Mountains, lat. 48° N. (Bourgeau). Melville Island, Arctic Sea coast, Kotzebue's Sound (Torr. & Gray). July.

D. Canadensis, Brunet. Canada Whitlow Grass.

Indigenous. "Légèrement pubescente à poils étoilés; tige fenilée, ordinairement simple; feuilles radicales aiguës, hancéolées, atténuées à la base, généralement entières quelquefois munies au sommet de deux dents latérales; feuilles caulinaires oblongues et dentées; fleurs blanches; en grappe simple; pétales échancrés au sommet plus longs que le calice; silicules ovales-elliptiques, longues de 4 à 5 douzièmes de pouce, rarement contournées; pédicelles inférieurs deux fois plus long que la silicule, pédicelles supérieurs plus courts."—Catalogue des Plantes Canadiennes, par L'Abbé Ovide Brunet, Quebec, 1865. Crevices of rocks, St. Joachim, Cap Tourmente, Quebec.

D. arabisans, Michx. Arabis-like Whitlow Grass.

Indigenous. Ledges of rock, river banks, and lake shores. North shore of Lake Superior (Agassiz and Pitcher). Rocky Mountains (Bourgeau). July.

D. incana, L. Var. *contorta*, Ehrh.

Indigenous. Coast of Labrador, on rocks (Brunet). Islands of the St. Lawrence (Torr. & Gray). Unalaska and Arctic America (Hooker). Cariboo, Labrador (Butler). Vicinity of Montreal (Provancher).

D. nemorosa, L.

Indigenous. Rocks and sandy grounds. On sands at the mouth of the Michipicotin River, July 26, 1869. This is undoubtedly the same *Draba* found by Agassiz at the same place some twenty-five years ago. Reported from Port Huron, and will therefore in all probability be found on the sandy plains of Sarnia, on the Canada side. This is probably the *D. muralis* reported from the vicinity of Montreal by Hooker, Fl. Bor.-Am. I. p. 56. Upper British Columbia and Peace River (Macoun).

D. Caroliniana, Walt. Var. *umbellata*, Torr. & Gray.

Indigenous. Dry calcareous soils. Ox Point and vicinity of Belleville, Hastings Co.; abundant at Ferry House, opposite Belleville; Grape Island, at the head of the Bay of Quinté, Ont. (Macoun). Amherstburg, Ont. (MacLagan).

D. verna, L. Whitlow-grass.

Probably introduced. Fields and hillsides in the vicinity of Quebec (Brunet). Cap Tourmente (Provancher).

COCHLEARIA, Tourn. Scurvy Grass.

C. officinalis, L. Official Scurvy Grass.

Indigenous. Rocks. Southern coast of Labrador (Brunet). Arctic America (Hooker). Silicles globose-ovate, half as long as the pedicels; radical leaves petioled, cordate, cauline ones ovate, toothed or angled.

C. tridactylites, DC.

Indigenous. Rocks. Ledges of rock. Labrador and Cape Charles (Brunet). Labrador (Herb. Banks). Silicles globose-ovate; cauline leaves with a single tooth on each side, as if 3-lobed.

Alyssum calycinum.

Brock's Monument, Ontario (Judge Clinton).

VESICARIA, Lam. Bladder Pod.

V. arctica, Richardson. Northern Bladder Pod.

Indigenous. Rocks. Canescent, with a stellate pubescence; stem 5'—8' high, simple or somewhat branched above; radical leaves spatulate, crowded, entire, or with a single notch on each side, obtuse; cauline ones few, linear; style slender, about half the length of the globose silicle; silicles glabrous, or minutely pubescent. Seeds 4—6 in each cell, roundish, without a margin. Island of Anticosti (Mr. Shepard, Torr. & Gray). Plains of North Saskatchewan River (Bourgeau). West of the Assinaboine River (Macoun). In the latter locality was found the variety (*a*) of Torrey & Gray, "silicles minutely pubescent."

CAMELINA, Krautz. False Flax.

C. sativa, Krautz. False Flax.

Introduced from Europe. In cultivated fields. In a field at Lotbinière (Brunet). New Brunswick (Dr. Fowler). Vicinity of Prescott (Billings). Fields in the vicinity of Belleville; fields near Collingwood and Owen Sound, Ont. (Macoun). Cayuga, Ont. (MacLagan). Paris, Ont. (Buchan).

CAPSELLA, Vent. Shepherd's Purse.

C. Bursa-pastoris, Moench. Shepherd's Purse.

Introduced and naturalized from Europe. Waste place. Everywhere abundant from the mouth of St. Lawrence, through Quebec and Ontario, westward to the Pacific Ocean. Through the summer.

THLASPI, Tourn. Penny Cress.

T. arvense, L. Field Penny Cress, or Mithridate Mustard.

Naturalized from Europe. Waste places and cultivated fields. Anticosti Island, Salmon River, vicinity of Quebec (Brunet). Nicolet and Montreal (MacLagan). Rivière du Loup (Dr. Thomas). Streets of Prescott and Toronto (Macoun). Plains of the Saskatchewan (Bourgeau). Between Fort Garry and Winnipeg (Macoun). June, July.

T. alpestre, L.

Probably introduced. Vicinity of Quebec (Provancher).

LEPIDIUM, L. Pepperwort. Peppergrass.

L. Virginicum, L. Virginian Peppergrass.

Introduced from the South. Roadsides, railroads, and waste places. Roadsides, Cape Souté, Quebec (Brunet). New Brunswick (Dr. Fowler). Roadsides and fields near Belleville, Ont. (Macoun). Vicinity of London, Ont. (Saunders). Roadsides, Hamilton (Logie). Huron County, Ont. (Gibson). Mississagui River, Lake Huron (Prof. Bell). Owen Sound, Whisky Island, and Little Current (Dr. John Bell). We are doubtful whether this species was found on Lake Huron by the last two observers, as Prof. Macoun in the same locality detected only the *L. intermedium*, which, being the northern form, is certainly the indigenous one; *vide* Gray, 5th edition. Citadel Hill, Montreal (Dr. Holmes). June to September.

L. intermedium, Gray. Peppergrass.

Indigenous. In fields and dry places. North of the Counties Hastings and Northumberland, Ont.; Picton, Prince Edward County, Ont.; Little Current, Georgian Bay; Fort Edmonton on the Saskatchewan; Fort Assinaboine on the Athabasca; Little Slave Lake; Dunvegan, Peace River (Macoun). Saskatchewan Plains (Bourgeau).

L. ruderale, L.

Indigenous and introduced. Roadsides and waste places. Roadsides, Hamilton, Ont., introduced (J. M. Buchan). West of the Little Saskatchewan, indigenous (Macoun). British America to the Pacific (Torr. & Gray).

L. campestre, L. Field Peppergrass.

Naturalized from Europe. Cultivated grounds and old fields. Niagara Falls (Macoun). Vicinity of Hamilton, Ont. (J. M. Buchan).

CAKILE, Tourn. Sea-Rocket.

C. Americana, Nutt. American Sea Rocket.

Indigenous. Gravelly beaches of the sea and Great Lakes. Kamouraska and Anticosti (Brunet). New Brunswick (Dr. Fowler). Trois Pistoles (Macoun). Sea shore, Rivière du Loup (Dr. Thomas). Wellington beach, Lake Ontario; Prince Edward County (Macoun). Hamilton (Buchan). County Huron, on Lake Huron (Gibson). Cockburn Island and McLeod's Harbour (Dr. Bell). North shore of Lake Superior (Agassiz). West coast of Newfoundland (Dr. Bell).

RAPHANUS, L. Wild Radish.

R. Raphanistrum, L. Wild Radish. Jointed Charlock.

Introduced from Europe. Waste places. New Brunswick (Dr. Fowler). Barrie, Lake Simcoe, Ont. (Buchan). June to August.

CAPPARIDACEÆ.

POLANISIA, Raf. Polanisia.

P. graveolens, Raf. Heavy-scented Polanisia.

Indigenous. Gravelly beaches of lake shores. Border of Lake Ontario, Kingston, Ontario (Brunet). Burlington beach, common (Logie). Montreal,

Lake Ontario, and Malden, Ont. (MacLagan). St. Helen's Island, Montreal (Dr. Holmes). June to August.

VIOLACEÆ.

VIOLA, L. Violet Heart's-case.

V. lanceolata, L. Lance-leaved Violet.

Indigenous. Marshes, wet meadows, and shores of streams. New Brunswick (Dr. Fowler). Muskoka Lake, Ont. (F. Seymour). Sault Ste. Marie, Lake Superior, in rear of the village, July 9, 1869 (Macoun). May to July.

V. primulæfolia, L. Primrose-leaved Violet.

Indigenous. Damp soil and wet meadows. Rivière du Loup, not common (Dr. Thomas). May to July.

V. blanda, Willd. Sweet White Violet.

Indigenous. Wet woods, low grounds, and along streams. New Brunswick (Mathews). Isle aux Noix, Montreal; Kingston and Amherstburg, Ont. (MacLagan). Rich woods generally on limestone, Rivière du Loup (D'Urban). Prescott (Billings). Owen Sound; woods at Thunder Bay (Macoun). McLeod's Harbour and Cockburn Island (Dr. John Bell). Hamilton (Logie). London (Saunders). County Huron, Ont. (Gibson). Plains of the Saskatchewan (Bourgeau). Fort Edmonton; Fort Assinaboine on the Athabasca; Little Slave Lake (Macoun). Labrador (Butler). Upper British Columbia and Rocky Mountains, lat. 56° N. (Macoun).

V. renifolia, Gray. Kidney-leaved Violet.

Indigenous. Dry cedar swamps and rich woods. In cedar swamps, Castleton Village, Northumberland Co., Ont., May 24, 1860. Cedar swamps east of Belleville, 1861; low, rich woods, Brighton, Northumberland Co., Ont., 1865 (Macoun). This species is evidently common throughout Canada, but has hitherto been taken for a pubescent form of *V. blanda*. Fort St. James, Upper British Columbia, through the Rocky Mountains to St. John's, on Peace River, lat. 56° N.; woods at Methy Portage, lat. 56° N. (Macoun).

V. palustris, L. Marsh Violet.

Indigenous. Marshes. One mile west of Prince Arthur's Landing, Dawson route, Lake Superior, July 22, 1872 (Macoun). West coast of Newfoundland (Dr. Bell). From Vancouver Island throughout British Columbia to lat. 56° N.; Lake Athabasca and Methy Portage (Macoun).

V. Selkirkii, Pursh, Goldie, 1822. Great Spurred Violet.

Indigenous. Damp shady soil. Gate Lake, Wentworth Township, Quebec (D'Urban). Rivière du Loup (Thomas). Dartmouth River, Gaspé Peninsula; McLeod's Harbour, Lake Huron (Dr. Bell). Lake Superior (Robbins). Island of Montreal (Dr. Holmes). Walkerton and Owen Sound (Buchan).

V. cucullata, Aiton. Common Blue Violet.

Indigenous. Wet meadows and woods. Common throughout Ontario, Quebec, and the Maritime Provinces. Plains of the Saskatchewan River (Bourgeau). Little Slave Lake (Macoun). Arctic America (Torrey & Gray). West coast of Newfoundland (Dr. Bell).

V. cucullata, Ait. Var. *cordata*, Gray.

Indigenous. Dry, rocky hillsides. Dry hillsides covered with poplars (*P. tremuloides*), near Belleville (Macoun). Cemetery and open fields, near English's woods, London, Ont., not very common, labelled *V. villosa* (Saunders).

V. cucullata, Ait. Var. *palmata*, Gray.

Indigenous. Swamps and low grounds. Amherstburg, Ont. (Maclagan).

V. sagittata, Ait. Arrow-leaved Violet.

Indigenous. Dry, sandy and gravelly fields, woods, copses, and pastures, rare. Vicinity of Belleville, Ont.; Rice Lake plains, Ont.; near Toronto (Macoun). Galt, Ont. (Miss Crooks). Jones' Falls, Rideau Canal; Amherstburg, Ontario (Maclagan); Nun's Island, Berthier, Quebec (Dr. Holmes). Lorette, Stanfold (Provancher). May.

V. canina, L. Var. *sylvestris*, Regel. Dog Violet.

Indigenous. Borders of brooks, and damp shady woods. Common throughout Ontario, Quebec, and the Maritime Provinces. Saskatchewan Plains (Bourgeau). Edmonton on the Saskatchewan; Fort Assinaboine on the Athabasca, Little Slave Lake; Dunvegan on Peace River (Macoun). Labrador and British America, lat. 59° N. (Torr. & Gray). May.

V. rostrata, Pursh. Long-spurred Violet.

Indigenous. Rocky woods, and shaded hillsides. Smith's Falls, Kingston, Ont., and Chippewa, Ont. (Maclagan). Hastings and Northumberland Counties, rare (Macoun). Rare at Prescott, Ont. (Billings). Woods, Hamilton (Logie). Vicinity of London, common (Saunders). Owen Sound? (Dr. Bell). This species seems to be confined to Ontario. May.

V. striata, Ait. Pale Violet.

Indigenous. Rich open woods and low grounds. Common at London, Ont. (Saunders). Common near Hamilton, Ont. (Logie). Island of Montreal (Herb. McGill College). May to September.

V. Canadensis, L. Canada Violet.

Indigenous. Rich woods. Common from Newfoundland to Lake Superior. Grand Islands, Lake Huron (Prof. Bell). St. Joseph's Island, Lake Huron (Dr. Bell). Saskatchewan plains (Bourgeau). Fort Edmonton; Fort Assinaboine, on the Athabasca; Dunvegan, Peace River (Macoun). Hudson's Bay (Torr. & Gray). Woods, Upper British Columbia to lat. 56° N. (Macoun). May to August.

V. pubescens, Aiton. Downy Yellow Violet.

Indigenous. Rich woods. Common throughout Ontario and Quebec. Gore Bay and Vermont Harbour, Lake Huron (Dr. John Bell). Saskatchewan Plains (Bourgeau). May, June.

V. tricolor, L. Pansy. Heart's Ease.

Naturalized from Europe. Waste places. New Brunswick (Dr. Fowler). Spontaneous in some gardens, Belleville, Ont. (Macoun). The var. *arvensis*. DC. is reported from Lake Huron by Provancher. May to August.

CISTACEÆ.

HELIANTHEMUM, Tourn. Rock Rose.

H. Canadense, Michx. Frost-weed.

Indigenous. Dry, sandy, or gravelly soil. East of Belleville; very abundant on Rice Lake plains; St. James' Cemetery, Toronto; Point aux Pins, Lake Superior (Macoun). English's woods, common, London (Saunders). Galt, Ont., by Miss Crooks (Logie). Sandwich, Ont. (MacLagan). Sandy plains of the Rivière aux Sables, Co. Lambton, Ont. (Gibson). North shore of Lake Superior (Agassiz). Plains of the Saskatchewan (Bourgeau). Fort Francis, Dawson route (Macoun). June to August.

HUDSONIA, L. Hudsonia.

H. tomentosa, Nutt. Downy Hudsonia.

Indigenous. Sandy shores of the Great Lakes and St. Lawrence. Anticosti, St. Laurent, Quebec (Brunet). New Brunswick (Dr. Fowler). Montreal Island, Point aux Pins, and sandy islands of Lake Superior (Macoun). Lake Champlain to Slave Lake (Torr. & Gray). 15-mile Point, Rainy Lake, and Lake of the Woods (Macoun).

LECHEA, L. Pinweed.

L. Major, Michx. Greater Pinweed.

Indigenous. Dry woods and sterile soil. Rare at London, Ont. (Saunders). In dry woods, Canada (Torr. & Gray).

L. thymifolia, Pursh.

On sands on the sea coast. Kent Co., New Brunswick (Dr. Fowler).

L. minor, Lamarck. Lesser Pinweed.

Indigenous. Dry sandy fields and open woods. West of Brockville, Ont. (Billings). Three Rivers, Quebec, and Sandwich, Ont. (MacLagan). Rice Lake Plains; Heely Falls, County Northumberland; rare in the vicinity of Belleville, Ont., sandy woods, Gull Lake, County Addington; St. Nora's Lake, 8½ miles north of Lindsay, Ont.; St. James' Cemetery, Toronto, (Macoun). Not common, London (Saunders). Vicinity of Hamilton (Buchan). Rivière aux Sables, Co. Lambton, Ont. (Gibson). Sturgeon Lake, Dawson Route (Macoun).

DROSERACEÆ.

DROSERA, L. Sundew.

D. rotundifolia, L. Round-leaved Sundew.

Indigenous. Sphagnum swamps and wet bogs. Cedar swamps, Quebec (Brunet). Bogs, Rivière du Loup (Dr. Thomas). Labrador (Butler). New Brunswick (Mathews). Near Prescott Junction (Billings). Partridge Lake, Hooper's Lake, County Hastings and Northumberland; Owen Sound; Fishing Islands, Lake Huron; north-east coast of Lake Superior (Macoun). Westminster Pond, London, Ont. (Saunders). Vicinity of Paris and Ancaster, Ont. (Logie). Lake Burwell, County Lambton (Gibson). Cockburn Island, Lake Huron (Dr. Bell). Nicolet and Montreal (MacLagan). Plains of the Saskatchewan (Bourgeau). West coast of Newfoundland (Dr. Bell).

D. longifolia, L. Spatulate-leaved Sundew.

Indigenous. Sphagnous swamps, borders of lakes and ponds. New Brunswick (Dr. Fowler). Cedar swamps, Batiscan, Quebec (Brunet). Indian Village, on the River Rouge, also at Lake of the Two Mountains (D'Urban). Bogs and swamps, North Hastings, Ont.; peat bog, Kennebec, County Addington; shore of Lake Huron, at Oliphant (Macoun). Westminster Pond, London (Saunders). North shore of Lake Superior (Agassiz).

D. linearis, Goldie. Linear-leaved Sundew. Slender Sundew.

Indigenous. Marshes. Lake Simcoe, Ont. (Goldie). Chicken Bay, and at Oliphant, Lake Huron (Macoun). MacLeod's Harbour and Cockburn Island (Dr. Bell). Lake Superior (Provancher).

HYPERICACEÆ.

HYPERICUM, L. St. John's-wort.

H. pyramidatum, Ait. Great St. John's-wort.

Indigenous. River bottoms and low lands. River Lachine, Montreal (Brunet). Roadsides near Madoc, Hastings County; Rice Lake plains (Macoun). Vicinity of London, not common (Saunders). Fullarton, Ont. (J. M. Buchan). Bayfield River, County Huron, Ont. (Gibson). Plains of the Saskatchewan (Bourgeau).

H. Kalmianum, L. Kalm's St. John's-wort.

Indigenous. Wet rocks and low grounds. Falls of Niagara (Douglas). Shores of Lake Isaac, Bruce Peninsula, Lake Huron; Red and Chicken Bays, Lake Huron; and Oliphant, Lake Huron (Macoun). Shores of Whisky, Mississaugui, and Cockburn Islands, Lake Huron (Dr. Bell). Hamilton (Logie). Huron Co., Lake Huron (Gibson).

H. ellipticum, Hooker. Elliptical-leaved St. John's-wort.

Indigenous. Low grounds and shady banks of streams and lakes. New Brunswick (J. G. Mathews). Pastures and meadows, Quebec (Brunet). Kingston and Chippawa, Ont. (MacLagan). Counties of Hastings and Northumberland; Gull River, Victoria County; shore of Lake Huron, at Oliphant; Pie Island, Thunder Bay, and Sault Ste. Marie (Macoun). Goulais Point, Lake Superior (R. Bell). Hamilton? (Logie). Rare at London (Saunders).

H. perforatum, L. Common St. John's-wort.

Introduced from Europe. Roadsides, fields and pastures. New Brunswick (Mathews). Pastures and meadows, Quebec (Brunet). Kingston and Chippawa, Ont. (MacLagan). Northumberland and Hastings Counties, Toronto, and Owen Sound (Macoun). Prescott, common (Billings). Common at London (Saunders). Hamilton (Logie). Counties Lambton and Huron (Gibson).

H. corymbosum, Muhl. Corymbed Hypericum.

Indigenous. Low, rich grounds. Near Quebec, and Island of Orleans (Brunet). Nicolet and Belœil; Niagara, Thorold, and Malden (MacLagan). Scarce in Northumberland County; Red Bay, Lake Huron, abundant, and at Oliphant and Fishing Islands, Lake Huron (Macoun). Prescott (Billings). London (Saunders). Hamilton (Logie). Co. Huron, Ont. (Gibson). Island of Montreal (Herb. McGill College).

H. mutilum, L. Diminutive-flowered Mutilus.

Indigenous. Low grounds and river banks. New Brunswick (Dr. Fowler). In Quebec (Brunet). Prescott, Ont. (Billings). Bruce Peninsula, Lake Huron, and north shore of Lake Superior (Macoun). Common at London (Saunders). Western Canada (Maclagan). Sault Ste. Marie (Prof. Bell). Hamilton (Buchan). Mississagui, and St. Joseph's Islands, Lake Huron (Dr. Bell). Island of Montreal (Herb. McGill College).

H. Sarothra, Michx.

Indigenous. Sandy fields and roadsides. Canada (Torrey & Gray; Provancher).

H. Canadense, L. Canada St. John's-wort.

Indigenous. Wet ground and sandy soil. New Brunswick, Kent Co. (Dr. Fowler). Quebec (Brunet). Near Prescott (Billings). Wet, sandy fields, Belleville; head of the Bay of Quinté; Fishing Islands, Lake Huron (Macoun). Sandwich, Ont. (Maclagan). Mississagui River, Lake Huron (Dr. Bell). Loon Portage, Dawson route (Macoun). Newfoundland (Torrey & Gray).

H. Canadense, L. Var. major, Gray.

Indigenous. Head of Bay of Quinté, Ont. Lake Superior (Robbins).

ELODES, Adans. Marsh St. John's-wort.

E. Virginica, Nutt. Marsh St. John's-wort.

Indigenous. Swamps and marshes. New Brunswick (Mathews). Quebec, Charlesburg, &c. (Brunet). Three Rivers, Montreal; Kingston, Chippawa, and Malden (Maclagan). Common in Central and Western Canada. Kamistiquia River, Lake Superior; Red Bay and Oliphant, Lake Huron (Macoun). Islands of Lake Huron (Dr. Bell).

CARYOPHYLLACEÆ.

SAPONARIA, L. Soapwort.

S. officinalis, L. Bouncing Bet.

Naturalized from Europe. Waste places. Abundant through Hastings, Northumberland, and Prince Edward Counties (Macoun). Vicinity of London (Saunders). Hamilton (Logie). Owen Sound (Macoun).

VACCARIA, Medik. Cow-herb.

V. vulgaris, Medik. Common Cow-herb.

Introduced. Scarcely naturalized. Cultivated fields and gardens at Belleville and Owen Sound. Fort Francis, Dawson route (Macoun).

SILENE, L. Catchfly.

S. inflata, Smith. Bladder Campions.

Introduced. Vicinity of Belleville, very scarce. Quebec (Mrs. Percival). Vicinity of Prescott, rare (Billings). Hamilton City (Logie). Loretto, Montreal, and Tamiscouta (Dr. Maclagan). Rivière du Loup, common (Dr. Thomas). Kent Co., New Brunswick (Dr. Fowler).

S. antirrhina, L. Snap-dragon Catchfly.

Indigenous. Dry, rocky or gravelly soil and sandy plains. Extends from the Atlantic to the Pacific, and from Florida, on the south, to North-eastern Ontario, on the north. Prescott, rare (Billings). Galt (Miss Crooks). Hamilton (Buchan). Huron County, Ont. (Gibson). Kingston Mills, Niagara, and Malden, Ont. (Dr. MacLagan). Central Canada, abundant; Thunder Bay and Kaministiquia River; Sturgeon Lake, Dawson route; Fort Edmonton and North Saskatchewan; Vancouver Island (Macoun). Saskatchewan plains (Bourgeau). Mississauga Island, Lake Huron (Dr. Bell).

S. noctiflora, L. Night-flowering Catchfly.

Introduced from Europe. Cultivated grounds and waste places. Abundant in Ontario, Indian Village, Arundel (D'Urban). Kent County, New Brunswick (Dr. Fowler). Canoe Route, Dawson Road (Macoun). Bruce Mines, Lake Huron (Dr. Bell).

S. acaulis, L. Moss Campion.

Indigenous. Rocky places. Labrador coast (Brunet). Rocky Mountains, lat. 53° N. (Bourgeau). Cariboo Mountains (Macoun). Arctic America to the Pacific (Dr. James).

S. Armeria, L. Lobel's Catchfly. Garden Catchfly.

Introduced from Europe. Escaped from gardens. Kent Co., New Brunswick (Dr. Fowler). Spontaneous in a few gardens in Central Canada.

S. Virginica, L. Fire Pink. Catchfly.

Indigenous. Open woods. In Canada is apparently confined to the south-western portion of Ontario. Upper Canada (Hooker). Islands at Detroit River (MacLagan).

LYCHNIS, Tourn. Lychnis. Cockle.**L. Githago, Lam. Corn Cockle.**

Introduced from Europe. Cultivated land. Throughout the wheat-bearing region of Canada. Abundant at Fort Francis, Fort Garry, Fort Edmonton, Dunvegan on Peace River, and Vancouver Island.

L. vespertina, Smith. Evening Lychnis.

Introduced from Europe. Dry grassy fields. Township of Stanley, County of Huron, Ont. (Prof. Gibson).

ARENARIA, L. Sandwort.**A. serpyllifolia, L. Thyme-leaved Sandwort.**

Introduced, though at times apparently indigenous. Labrador (Brunet). Kent County, New Brunswick (Dr. Fowler). Sandy places by the sea, Rivière du Loup (Dr. Thomas). Woods and fields near Ottawa (Billings). London (Sauriers). Hamilton (Buchan). Huron County, Ontario (Gibson). Owen Sound (Macoun). Central Canada.

A. stricta, Michx.

Indigenous. Rocky, gravelly, and sandy soil. Near London, Ont. (Sauriers). Huron County (Gibson). North shore of Lake Superior (Agassiz).

Common in Central Canada (Macoun). McLeod's Harbour, Cockburn Island, Lake Huron (Dr. Bell). Saskatchewan plains (Bourgeau). Red Bay, Bruce Peninsula, Lake Huron; Pic River, north-east shore of Lake Superior; Lake of the Woods; Dunvegan, Peace River (Macoun). North to Arctic America (Hooker).

A. stricta, Michx. Var. *juniperina*.

Macoun and Gibson.

Arenaria groenlandica.

Hillsides, Baie des Rochers, Labrador (Butler).

A. lateriflora, L. Broad-leaved Sandwort.

Indigenous. Gravelly shores and damp, shady places. Labrador and Restigouche (Brunet). Kent County, New Brunswick (Dr. Fowler). Nicolet, Kingston, Chippewa (MacLagan). Rivière du Loup (Dr. Thomas). Central Canada (Macoun). Eastern shore of Lake Huron (Gibson). From N. lat. 40° to the Arctic Circle (Torr. & Gray). Saskatchewan valley (Bourgeau). Dunvegan, Peace River (Macoun). Montreal Island (Herb. McGill College). West coast of Newfoundland (Dr. Bell).

A. peplodes, L. Sea-side Sandwort.

Indigenous. Sands of the sea-shore. Coast of Labrador (Brunet). Kent Co., New Brunswick (Dr. Fowler). Sea-shore, Rivière du Loup (Dr. Thomas). Atlantic coast, from N. lat. 40° to Labrador and the Arctic Circle (Torr. & Gray). West coast of Newfoundland (Dr. Bell).

A. verna, L. Var. *hirta*, Fenzl.

Indigenous. Carpsitose, 2'-3' high, minutely hirsute; leaves subulate, 3-nerved, erect, obtuse or acutish; cyme erect, few or many flowered; sepals ovate, acute, strongly 3-nerved, mostly exceeding the petals. Kotzebue's Sound (Beechey). Greenland and Behring Straits (S. Watson). Cape Charles, Labrador (Brunet). Amoor Bay, Labrador (Butler.)

STELLARIA, L. Chickweed.

S. media, Smith. Chickweed.

Introduced from Europe. Everywhere in damp, rich soils and old gardens. Little Slave Lake and Dunvegan. Peace River (Macoun). N. W. America, (Torr. & Gray). West coast of Newfoundland (Dr. Bell).

S. longifolia, Muhl. Long-leaved Chickweed.

Indigenous. Grassy places. Kent County, New Brunswick (Dr. Fowler). Prescott Junction and Ottawa (Billings). Vicinity of Hamilton (Logie). Chippewa and Malden, Ont. (MacLagan). Vicinity of London (Saunders). Near the Bayfield and Maitland Rivers, Ont. (Gibson). Common in Central Canada, Sault Ste. Marie, Rainy River, Little Slave Lake, Fort Assinaboine, on the Athabasca; Dunvegan, on Peace River (Macoun). From Virginia to Sub-Arctic America, and westward to Sitka and Oregon (Torr. & Gray). Saskatchewan plains (Bourgeau). St. Joseph's Island, Lake Huron (Dr. Bell). Lachine woods, Montreal (Herb. McGill College).

S. longipes, Goldie. Long-stalked Chickweed.

Indigenous. Rocky grounds. Vicinity of Quebec (Brunet). Restigouche County, New Brunswick (Dr. Fowler). Rocky ground, vicinity of Belleville,

Ont.; north shore of Lake Superior; Victoria Missions, Saskatchewan River; Fort Assinaboine, Athabasca River; Little Slave Lake; Dunvegan, Peace River; Fort St. James, British Columbia; Cariboo Mountains; Vancouver's Island (Macoun). From Maine to Wisconsin thence northward through Canada to the Arctic Sea, and westward to the Pacific coast; but in no locality seems to be very common. Labrador coast (Butler).

S. uliginosa, Murr. Swamp Chickweed.

Indigenous. Swamps and springs. Moosepath, New Brunswick (Mathews). Kent County, New Brunswick (Dr. Fowler). Rocky Mountains (Hooker). Unalaska (Chamisso).

S. crassifolia, Ehrh.

Indigenous. Marshy flats. Labrador, south coast (Butler).

S. gracilis, Richardson.

Indigenous. Perennial, growing in tufts. Stems glabrous, weak and branching, about eight inches high. Leaves lanceolate, spreading, succulent, upper ones slightly ciliate-margined. Peduncle solitary, axillary or terminal, one-flowered. Pedicel generally over an inch long, spreading. Petals two-parted, slightly longer than the scarious-margined, glabrous, acute sepals. In general appearance this species resembles wide-leaved varieties of *S. borealis*, but its mode of inflorescence is quite different in detail. Hudson's Bay, Cumberland House (Richardson). Pie Island, Thunder Bay, growing in tufts close to the water. July 15th, 1869.

S. borealis, Bigelow. Northern Starwort.

Indigenous. Cool bogs and swamps. New Hampshire and New York to Arctic America, thence west and south through Oregon and California to the Pacific coast (S. Watson, in King's Report). Kent County, New Brunswick (Dr. Fowler). Anticosti and River Saguenay (Brunet). Bevin's Lake, Montcalm, River Rouge (D'Urban). Mt. Johnson, Quebec (Dr. MacLagan). Lake Burwell, County Lambton, Ont. (Gibson). Saskatchewan plains (Bourgeau). St. Joseph's Island, Lake Huron (Dr. Bell). Arctic America (Hooker). Cold Swamps, Hastings County; Thunder Bay, Lake Superior; marshes at the mouth of the Kaministiquia; Little Slave Lake; Dunvegan, Peace River; Cariboo Mountains, and a form from Vancouver's Island (J. Macoun). June.

S. humifusa, Rottbøll.

Indigenous. Greenland to the Arctic Sea, and west to Sitka (Torr. & Gray). York County, New Brunswick (Dr. Fowler). Kamouraska (Dr. MacLagan). Greenland, Arctic Sea, and Sitka (Bougard).

CERASTIUM, L. Mouse-ear Chickweed.

C. vulgatum, L. Mouse-ear Chickweed.

Introduced. Waste places from Florida to Eastern Canada. Vicinity of Quebec (Brunet). Common among grass at Hamilton's Farm, River Rouge (D'Urban). Rivière du Loup (Dr. Thomas). In gardens at Kingston and at Fort William, Thunder Bay, Lake Superior. Lately reported from vicinity of Hamilton by J. M. Buchan, Esq.

C. viscosum, L. Larger Mouse-ear Chickweed.

This species is certainly indigenous in Ontario, being found in many cases at great distances from cultivated grounds. Gray seems to think it is indi-

genous to the Northern United States, and gives fields and copses as its habitats; whilst Chapman, in his Flora of the Southern States, cites only fields. It seems probable, therefore, that both in Canada and in the United States we have two forms, the one introduced, the other indigenous. Everywhere common at Prescott (Billings). Vicinity of Quebec (Brunet). Kent County, New Brunswick (Dr. Fowler). City of Hamilton (Logie). Near Goderich (J. Gibson). Kingston and Amherstburg (Dr. MacLagan). Common in Central Canada, Toronto, Owen Sound (J. Macoun). Bruce Mines, Lake Huron (Dr. Bell). Plains of the Saskatchewan (Bourgeau). West coast of Newfoundland (Dr. Bell). May to July.

C. nutans, Raf. Nodding Mouse-ear Chickweed.

Indigenous. Low moist grounds from Hudson's Bay to Louisiana, and west to Vancouver and Oregon. In Canada it seems to have been generally overlooked; very abundant in the vicinity of Belleville on wet limestone shingle; Prince Arthur's Landing; Big Lake, near Edmonton; Little Slave Lake and Vancouver Island (J. Macoun).

C. oblongifolium, Torr.

Indigenous. On rocky banks and hills. It seems to be confined, in its geographical range, to a comparatively small area. In the United States it is circumscribed by New York, Virginia, and Illinois; whilst in Canada it has only been reported from the vicinity of Amherstburg by Dr. MacLagan, and lately by J. M. Buchan, Esq., from the vicinity of Hamilton. April to June.

C. arvense, L. Field Chickweed.

Indigenous. On rocky banks, hills, and pastures, from Canada to Georgia and west to the Pacific; Rivière du Loup and Gaspé (Brunet). Mary Island, Islands in Detroit River (Dr. MacLagan). Vicinity of Hamilton (Buchan). Labrador (Butler). Kent Co., New Brunswick (Dr. Fowler). Rocky banks of the Moira, Trent, and Gull Rivers; sandy fields, Toronto; Point Aux Pins, entrance to Lake Superior; Dawson Route, Lake of the Woods; Plains west of Fort Garry; Edmonton, Saskatchewan River; Little Slave Lake; Dunvegan, Peace River; Fort St. James, New Caledonia, and Vancouver Island (J. Macoun). Plains of the Saskatchewan (Bourgeau).

C. alpinum, L. Alpine Chickweed.

Indigenous. "Perennial; silky, hirsute. Stems 4—6 inches high, few-flowered; leaves elliptical-ovate; peduncles more or less elongated; petals bifid at the point, twice the length of the scariously margined and hairy sepals" (Torrey & Gray). Capsule nearly twice as long as the calyx. In North America it extends from Greenland to the islands of Sitka and New Archangel on the west, and southward, on the authority of Brunet, as far as the coast of Labrador. Rocky Mountains (Bourgeau). Kotzebue's Sound and Unalaska (Beechey). Forteau Bay, Labrador (Butler).

SAGINA, L. Pearlwort.

L. procumbens, L. Procumbent Pearlwort.

Indigenous. Springy places and damp rocks. Kent County, New Brunswick (Dr. Fowler). West coast of Newfoundland (Dr. Bell).

S. nodosa, Fenzi.

Indigenous. Wet sandy soil and crevices of wet rocks. Upper Canada to the Arctic Sea and North-west coast. Coast of Maine, New Hampshire, also

Lake Superior and northward (Gray). North shore of Lake Superior (Agassiz). Island of St. Ignace; Agate Island; Michipicotin Island and along the North-east coast of Lake Superior (J. Macoun).

SPERGULARIA, Pers. Sand-Spurrey.

S. rubra, Presl. Var. *campestris*, Gray. Red Sandwort.

Indigenous. Sandy or generally dry soil, along the coast from New England to Virginia. Seldom Maritime (Gray). Halifax, Nova Scotia (Dr. Fowler). Hamilton, Ont. (Buchan).

S. Salina, Presl. Salt Sandwort.

Indigenous. Brackish lands, &c., along the coast from New England to Virginia and southward (Gray). St. John's, New Brunswick (C. F. Mathews). Kent County, New Brunswick (Dr. Fowler). Rivière du Loup; Labrador (Brunet).

S. media, Presl.

Indigenous. Salt marshes and sands. On the coast and in salt marshes and sands from Florida to Newfoundland. In Central British America from Lake Winnipeg to Bear Lake, and in the United States from Washington Territory to California. Found at a salt spring in Parley's Park, Wahsatch Mountains, Utah (S. Watson, in King's Expedition). Kent County, New Brunswick (Dr. Fowler).

SPERGULA, L. Spurrey.

S. arvensis, L. Corn Spurrey.

Introduced. Sandy fields from Maine to Florida. Fields and pastures, St. Joachim (Brunet). Kent County, New Brunswick (Dr. Fowler). St. John, Quebec (Maclagan). A most troublesome weed in New Brunswick (Fowler).

SCLERANTHUS, L. Knawel.

S. annuus, L. Annual Knawel.

Introduced from Europe. Waste places. Dry fields, New England and Middle States (A. Wood). Three Rivers, Quebec (Dr. Maclagan).

MOLLUGO, L. Indian Chickweed.

M. verticillata, L. Carpet-weed.

An immigrant from further south. Dry places throughout North America (Torr. & Gray). Borders of rivers near Montreal (Brunet). Island of Montreal (Holmes Herb., McGill College). Malden, Ont. (Dr. Maclagan).

PORTULACACEÆ.

PORTULACA, Tourn. Purslane.

P. oleracea, L. Common Purslane.

Introduced from Europe. Cultivated and waste grounds. Common in Central Canada (Macoun). Common in Western Ontario (Logie, Saunders, Maclagan, Gibson). Vicinity of Quebec (Brunet). Island of Montreal (Holmes Herb., McGill College). Near Fort Francis, Dawson Route (Macoun).

CLAYTONIA, L. Spring-beauty.

C. Virginica, L. Virginian Spring-beauty.

Indigenous. Moist, open woods. Frequent in Central Canada (Macoun). Abundant in Western Ontario (Logie, Saunders, Gibson). Kingston, Chippawa, St. Catharines, and Malden (Maclagan).

C. Caroliniana, Michx.

Indigenous. Rich woods. Common in Central Canada (Macoun). Prescott (Billings). Isle of Orleans; St. Anselme; Gaspé (Brunet). Abundant, River Rouge, Quebec, (D'Urban). New Brunswick (G. F. Mathews). Montreal, Three Rivers, Isle aux Noix, Kingston, Chippawa, Malden (Maclagan). Rivière du Loup (Dr. Thomas). Walkerton, and Owen Sound, Ont. (Buchan). New Brunswick, west to the Rocky Mountains (Hooker). West coast of Newfoundland (Dr. Bell).

MALVACEÆ.

MALVA, L. Mallow.

M. rotundifolia, L. Common Mallow.

Introduced from Europe. Waysides and cultivated grounds. Common in Central Canada (Macoun). Vicinity of London, Ont. (Saunders). Prescott (Billings). Gate of St. Louis, Quebec (Brunet). Vicinity of Hamilton (Logie). New Brunswick (Dr. Fowler). Kingston, Chippawa, Malden (Maclagan). Rivière du Loup (Dr. Thomas). Owen Sound, Ont. (Macoun). County Huron, Ont. (Gibson). Montreal Island (Dr. Holmes).

M. sylvestris, L. High Mallow.

Introduced. In gardens and waysides. Common in Central Canada (Macoun). Prescott, rare (Billings). New Brunswick (Dr. Fowler). Near Fort Francis, Dawson Route.

M. crispa, L. Curled Mallow.

Introduced. Sparingly escaped from old gardens. Gardens and waste places at Belleville, and Seymour (Macoun). New Brunswick (Dr. Fowler.)

M. moschata, L. Musk Mallow.

Introduced. Roadsides, escaped from gardens. Roadside on Rice Lake plains, and at Owen Sound, Ontario (Macoun). Island in Detroit River (Maclagan). Hamilton (Buchan).

ABUTILON, Tourn. Indian Mallow.

A. Avicennæ, Gaertn. Velvet-leaf.

Introduced. Waste places and potato fields. Frequent in Central Canada (Macoun). Vicinity of Dundas, Ont. (Logie).

HIBISCUS, L. Rose-Mallow.

H. Mosmentos, L. Swamp Rose-Mallow.

Indigenous. Brackish marshes along the coast and along rivers. An Island in Detroit River (Maclagan).

H. trionum, L. Bladder Ketmia. Flower-of-an-hour.

Introduced from Europe. Escaped from gardens. Spontaneous in a few gardens at Belleville, Ont. (Macoun). Malden, Ont. (MacLagan).

TILIACEÆ.

TILIA, L. Linden. Basswood.

T. Americana, L. Basswood.

Indigenous. Rich, moist woods. Common in Central Canada, and Owen Sound (Macoun). Common in Western Ontario (Logie, Saunders, Gibson). Prescott (Billings). Quebec (Brunet). River Rouge (D'Urban). New Brunswick (Dr. Fowler). St. Joseph's Island and Cockburn Island, Lake Huron (Dr. Bell). South side of Lake Superior (Prof. Bell). Lake of the Woods (Macoun). Saskatchewan plains (Bourgeau). Canada, lat. 52° (Hooker). The *T. Americana*, var. *pubescens*, reported from Quebec and Lake St. Clair by Douglas, is doubtless a more or less pubescent form of the above.

LINACEÆ.

LINUM, L. Flax.

L. Virginianum, L. Virginian Flax.

Indigenous. Dry woods. Vicinity of Hamilton (Judge Logie). Hills in Upper Canada (Torrey & Gray).

L. striatum, Walt.

Indigenous. Wet or boggy grounds. Shores of Lake Huron; Red Bay, Bruce Peninsula; Fishing Islands and Oliphant, Lake Huron (Macoun).

L. sulcatum, Riddell.

Indigenous. Dry soils. Rice Lake Plains and near Castleton, County Northumberland; Oak Hills, Hastings County, Ont. (Macoun).

L. usitatissimum, L. Common Flax.

Introduced from Europe. Cultivated ground and along the railway track. Common throughout Canada, especially along the railroad.

L. perenne, L. Perennial Flax.

Indigenous. Dry, gravelly soil. Perennial; glabrous; stems 1°—3°, branching above; branches virgate; leaves alternate, linear, acute, scattered; flowers supra-axillary and terminal, rather large; peduncles becoming elongated and nodding in fruit; sepals oval, with membranous margins, a little shorter than the globose capsule; petals free, somewhat retuse, blue 3—4 times the length of the calyx; styles five, capsules five-celled. Flowers throughout the summer. Indigenous at Marmora Lake, Peterborough County, Ont. (Macoun). Canada (Mrs. Percival, *vide* Hooker). Saskatchewan plains; Peace River Valley; west of the Rocky Mountains, Telegraph Trail (Macoun). To the Arctic Sea (Hooker).

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—JAN., 1870.
 Latitude—43° 39'4 North. Longitude—81° 17m. 33s. West. Elevation above Lake Ontario, 108 feet.

Day	Baromet. at temp. of 32°.			Temp. of the Air.			Excess of above Average.			Tension of Vapour.			Humidity of Air.			Direction of Wind.			Velocity of Wind.			Rain Inches	Snow Inches				
	6 A.M.	2 P.M.	10 P.M.	Mean.	0 A.M.	2 P.M.	10 P.M.	M.F.A.N.	A.M.	P.M.	M.	N.	A.M.	P.M.	M.	N.	0 A.M.	2 P.M.	10 P.M.	Resultant.	0 A.M.			2 P.M.	10 P.M.	Ico- sult.	M.F.A.N.
1	29.677	29.658	29.677	29.675	32.2	48.1	36.0	39.32	7.53	162	100	102	170	89	56	87	73	NW	NW	NW	N43W	19.7	24.0	5.2	16.10	10.35	
2	640	691	552	6013	37.4	49.2	43.0	43.57	3.52	139	154	169	169	62	51	60	60	NW	NW	N	N33W	10.0	8.0	6.2	6.18	8.31	
3	668	657	652	6588	38.0	65.2	43.0	45.50	1.82	170	183	193	183	72	42	60	61	NW	NW	S	S 8 W	2.0	10.5	4.4	3.98	6.51	
4	610	603	607	6255	38.6	63.6	48.8	45.80	2.40	217	168	234	204	88	41	75	60	E	E	S	N 83 W	9.0	13.0	2.0	3.59	10.66	
5	712	669	646	6255	40.2	44.9	43.4	42.56	6.47	221	255	276	245	98	65	92	90	E	E	E	N 73 E	11.5	16.0	9.0	11.59	12.10	
6	660	656	653	6245	45.0	50.4	50.6	52.25	3.63	294	300	265	294	88	66	72	76	E	E	N	N 81 W	6.6	10.0	6.0	5.56	8.32	
7	435	413	429	4203	45.8	65.8	60.1	50.85	0.87	—	—	—	—	—	—	—	—	S	S	N	N 77 E	5.0	6.2	3.2	6.39	7.27	
8	327	326	343	3688	40.9	55.8	62.2	53.40	4.07	352	387	265	325	98	58	67	80	N	N	W	N 73 W	6.4	15.6	11.0	5.04	8.94	
9	421	381	385	4032	47.4	48.5	43.0	49.21	3.42	268	263	231	257	82	77	92	82	N	N	S	S 46 W	2.2	4.0	1.8	1.75	3.27	
10	346	421	692	4033	40.9	45.6	44.6	44.37	6.68	215	260	225	241	96	85	77	84	N	N	NW	N 24 W	2.4	10.4	10.0	5.84	8.23	
11	727	768	728	7425	41.2	67.5	49.2	50.29	0.18	170	105	222	105	95	35	64	64	N	N	SW	N 67 W	15.0	7.4	12.0	7.77	10.17	
12	609	645	655	6418	43.8	47.4	45.0	46.15	4.68	260	272	218	241	91	83	71	73	N	N	W	N 70 W	3.8	7.4	6.6	2.74	7.08	
13	704	794	900	8048	42.3	63.9	44.1	46.78	4.32	202	182	166	192	74	41	68	61	N	N	W	N 48 W	10.0	10.0	3.2	4.67	15.46	
14	905	810	770	8295	36.8	61.7	49.2	48.56	2.88	—	—	—	—	—	—	—	—	W	W	S	S 40 W	2.0	3.8	2.2	2.50	4.12	
15	823	816	908	8670	45.0	41.6	43.0	43.04	8.74	180	218	234	224	60	94	81	81	E	E	N	N 65 E	8.0	13.0	6.0	4.88	8.47	
16	976	988	804	8318	45.2	61.6	47.0	47.64	4.67	165	179	167	167	61	80	64	60	E	E	N	N 74 E	4.0	21.0	16.0	4.82	8.43	
17	876	681	618	7067	46.1	60.4	51.0	50.86	1.02	285	365	332	331	91	80	89	89	N	N	E	N 81 W	9.6	6.0	4.0	3.24	7.12	
18	650	653	605	6740	62.4	66.7	56.6	60.13	7.32	418	471	300	385	88	71	68	73	N	N	N	N 80 E	1.6	0.0	3.8	0.98	4.65	
19	762	741	695	7202	62.4	60.8	65.7	60.57	0.40	303	366	348	325	77	60	78	64	N	N	E	N 78 E	8.4	10.0	1.0	4.05	6.78	
20	662	602	508	6785	63.0	60.6	63.6	67.00	3.47	349	444	411	409	89	84	100	88	E	E	N	N 78 E	3.8	16.0	8.0	4.83	7.81	
21	497	391	323	8843	60.2	73.0	61.0	63.28	0.42	—	—	—	—	—	—	—	—	W	W	SW	S 30 W	8.0	16.0	8.0	4.83	7.81	
22	805	804	765	84	68.6	65.8	45.2	62.60	1.60	451	234	126	262	92	63	42	61	E	E	SW	S 33 W	2.6	22.0	13.0	12.28	13.95	
23	932	942	880	9108	38.0	48.4	43.3	44.57	9.98	144	238	238	210	63	70	85	70	N	N	S	S 31 W	9.2	12.0	1.2	2.62	6.13	
24	886	731	694	7676	40.3	68.0	63.6	67.42	2.62	251	328	299	248	70	40	72	63	N	N	S	S 60 W	2.6	0.0	2.8	0.73	7.32	
25	693	746	743	7832	64.2	67.1	40.6	64.05	1.16	209	209	280	299	64	63	82	72	N	N	SW	S 65 E	9.2	12.0	2.6	1.43	7.56	
26	746	647	671	8443	45.9	60.7	60.0	65.72	1.85	201	248	307	256	64	47	83	63	N	N	SW	S 76 E	4.6	8.0	1.8	3.34	5.00	
27	650	480	497	6099	52.6	81.8	62.6	65.92	+10.02	328	276	374	332	83	20	66	60	N	N	SW	S 68 W	3.6	10.0	3.0	6.33	6.94	
28	625	464	483	4929	68.0	80.0	68.0	69.33	+13.11	—	—	—	—	—	—	—	—	W	W	N	N 68 W	2.4	14.8	6.0	6.43	7.42	
29	477	612	673	6573	60.9	61.1	62.8	68.17	+1.62	444	365	276	351	83	60	60	71	N	N	N	N 34 E	1.4	7.0	10.4	6.43	7.83	
30	788	765	688	7532	44.6	48.1	41.2	44.17	-11.90	164	172	164	163	66	60	68	64	N	N	E	N 78 E	12.0	10.5	6.0	8.97	9.83	
31	708	650	692	6589	40.6	64.8	61.8	67.33	+0.17	191	309	378	321	60	60	67	60	E	E	N	N 78 E	6.6	12.0	6.0	6.83	6.42	
29	6430	29	6310	29	6374	46.33	56.87	49.57	51.47	0.62	253	276	231	78	62	74	70	—	—	—	—	7.17	12.12	5.71	—	8.30	

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MAY, 1876.

COMPARATIVE TABLE FOR MAY.

YEAR.	TEMPERATURE.				RAIN.		SNOW.		WIND.	
	Mean above average.	Maxi. num.	Mini. num.	Range.	No. of days.	Inches.	No. of days.	Inches.	Direction.	Resultant Velocity.
1848	51.1	78.0	31.3	46.7	13	2.520	0	0.0	N 40 W	1.31
1849	48.0	72.2	27.9	44.3	16	5.115	0	0.0	N 51 E	1.97
1850	47.6	77.8	27.5	50.3	7	0.545	1	S	N 61 W	2.05
1851	51.3	78.3	28.0	45.3	12	2.950	1	0.5	N 32 W	1.99
1852	51.4	78.3	32.0	41.3	7	1.125	1	S	N 2 W	0.89
1853	50.9	78.4	32.2	46.2	17	4.420	1	0.0	East.	6.16
1854	52.2	71.4	25.2	46.2	11	1.630	0	0.0	N 1 W	0.40
1855	53.1	77.5	33.0	44.5	6	2.565	2	0.9	N 4 E	2.78
1856	50.5	74.8	31.2	51.0	14	1.580	1	0.2	N 23 W	3.99
1857	48.9	74.8	26.0	48.5	15	1.145	1	S	N 42 E	1.14
1858	48.9	79.6	31.0	38.5	17	6.367	0	0.0	N 52 W	2.66
1859	55.2	79.6	39.5	40.1	11	3.410	0	0.0	N 72 E	3.33
1860	55.5	74.5	32.5	42.0	12	3.380	0	0.0	N 26 E	1.69
1861	47.5	73.0	28.0	45.0	10	1.815	0	0.5	N 47 W	2.80
1862	52.2	78.5	32.4	46.1	8	1.427	0	0.0	N 56 W	2.80
1863	54.3	79.0	36.4	42.6	14	3.363	1	0.1	N 50 E	0.41
1864	54.5	79.0	32.2	46.8	18	4.070	0	0.0	N 7 E	1.86
1865	52.3	73.0	30.0	49.0	11	1.005	0	0.0	N 3 W	1.65
1866	48.3	73.4	33.4	40.0	13	2.820	0	0.0	N 46 W	5.48
1867	46.5	65.0	24.6	40.4	18	3.220	0	0.0	N 48 W	4.49
1868	51.5	73.0	33.2	39.8	16	7.670	1	S	N 51 W	8.65
1869	50.8	74.2	31.4	42.8	16	3.805	1	S	N 38 E	3.16
1870	56.3	81.2	38.8	42.4	10	1.150	0	0.0	N 20 W	2.38
1871	54.2	85.0	32.4	52.6	7	2.302	0	0.0	N 23 E	1.09
1872	51.9	78.8	32.0	46.8	14	1.914	0	0.0	N 52 W	2.25
1873	51.9	76.4	30.0	46.4	13	2.205	0	0.0	N 26 E	2.69
1874	52.5	86.0	25.3	60.7	8	1.492	0	0.0	N 49 W	2.64
1875	52.3	79.2	27.0	52.2	14	2.980	2	3.1	N 45 W	3.54
1876	51.6	81.9	30.4	51.5	13	3.230	0	0.0	N 22 W	1.41
Resultant to 1875.	51.69	76.55	30.87	45.68	11.92	3.132	0.15	0.39	N 16 W	1.70
Excess for 76.	0.22	5.35	0.47	6.82	1.08	0.098	0.15	0.30	...	1.87

NOTE.—The monthly means of the Barometer and Temperature include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 9 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest barometer 29.988 at 7 a.m. on 16th } Monthly range =
 Lowest barometer 29.271 at midnight on 21st } 0.717.
 { Maximum temperature 81°9 on 27th } Monthly range =
 { Minimum temperature 30°4 on 1st } 51°6.
 { Mean maximum temperature 60°42 } Mean daily range =
 { Mean minimum temperature 41°95 } 18°67.
 { Greatest daily range 34°6 from a.m. to p.m. of 27th.
 { Least daily range 7°4 from a.m. to p.m. of 14th.
 Warmest day 28th; mean temperature 69°33 } Difference = 30°01.
 Coldest day 1st; mean temperature 39°32 }
 Maximum { Solar 184°50 on 28th } Difference = 11°90.
 Radiation { Terrestrial 18°50 on 23rd }
 No Aurora observed.
 Possible to see Aurora on 17 night; impossible on 14 nights.
 Raining on 13 days; depth, 8.230 inches; duration of fall, 53.3 hours.
 Mean of cloudiness, 0.53.

WIND.

Resultant direction, N. 22° W.; resultant velocity, 1.41 miles.
 Mean velocity, 8.36 miles per hour.
 Maximum velocity, 29.0 miles, from 3 to 4 p.m. of 1st.
 Most windy day, 1st; mean velocity, 16.35 miles per hour.
 Least windy day, 9th; mean velocity, 3.27 miles per hour.
 Most windy hour, noon; mean velocity, 12.32 miles per hour.
 Least windy hour, 3 a.m.; mean velocity, 5.46 miles per hour.
 Fog on 6th, 8th and 20th.
 Dew recorded on 13 mornings.
 Ice on 1st, 2nd and 11th.
 Lightning on 13th, 17th, 20th, 21st and 28th.
 Thunder on 13th, 17th, 20th, 21st and 23th.
 Solar halos on 2nd, 11th and 14th.
 Lunar halos on 2nd and 4th.

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CONTENTS.

	PAGE
I. THE EASTERN ORIGIN OF THE CELTS. By JOHN CAMPBELL, M.A., Professor of Church History, Presbyterian College, Montreal.....	73
II. ON THE LEADING GEOLOGICAL AREAS OF CANADA. By E. J. CHAPMAN, Ph.D. Professor of Mineralogy and Geology in University College, Toronto.....	92
III. ALEXANDER GORDON, THE ANTIQUARY; A Supplementary Notice. By DANIEL WILSON, LL.D., Professor of History and English Literature, University College, Toronto.....	122
IV. LEAVES THEY HAVE TOUCHED; Being a Review of some Historical Autographs. (<i>Addenda</i> .) By HENRY SCADDING, D.D.	145
V. SYNOPSIS OF THE FLORA OF THE VALLEY OF THE ST. LAWRENCE AND GREAT LAKES; With Descriptions of the Rarer Plants. By JOHN MACOUN, M.A., Botanist to the Geological Survey, and JOHN GIBSON, B.A., F.G.S., F.B.S.E.	161

METEOROLOGY:

April Meteorological Table for Toronto, 1876.....	vii
Remarks on " " " ".....	viii
May Meteorological Table for Toronto, ".....	ix
Remarks on " " " ".....	x

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