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THE

CANADIAN

NATURALIST AND GEOLOGIST.

VOL. IV. AUGUST, 1859. No. 4.

ARTICLE XVIII.—*On the Natural History of the Gulf of St. Lawrence.* By ROBERT BELL, jr.

(Continued from our last Number.)

RADIATA.

Ophiocoma bellis.—Abundant at Ste. Anne adhering to the roots of *Agarum Turneri.**

Astrophyton scutotum.—This beautiful species does not seem to be very rare in the Gulf. I was informed by a person at Green Island, who possessed a specimen, that about a dozen of them were found clinging to a chain which had been submerged for some time, at a short distance from the island. A fine specimen from the Gulf in the collection of the Survey is about 16 inches in diameter, and I saw a fresh specimen in the hands of some fishermen who had, however, already disposed of it, which was nearly as large.

Cribella oculata.—Near Ste. Anne, I found two fine specimens of this species which had just been thrown up by the waves.

Solaster papposa.—Rather small specimens dredged at Marcouin in about 30 fathoms.

* An Alga with large perforated fronds.

Uraster, ——— ?—The species described by Principal Dawson on page 159 of this volume, and which may be *Asteracanthion Forbesi*, is by far the most abundant starfish on our coast. This is a well marked species and its characters are very constant. Amongst multitudes of them, I have never seen one which had either fewer or more than six rays, although an occasional individual was otherwise deformed. When alive their colour is deep purple above and light straw-colour beneath.

U. rubens.—Very abundant near low tide at Les Islets.

Echinarchinus Atlanticus.—Very abundant on smooth or muddy bottoms along the whole coast, from Rimouski downwards, and often found in stomachs of cod and haddock.

Echinus granularis.—Extremely abundant along the whole coast.

Cucumaria corumarius.—Sea Cucumbers, which seem to be identical with this species, were found alive very frequently at low tide about Ste. Anne, and for some miles farther up the coast; but they may have come from the Laminarian zone, as specimens were afterwards dredged in 12 fathoms at the same place.

Psolus (*?*)—A species of this genus is abundant in many places on the coast between Metis and St. Clair. When the black skin covering the scaly arrangement is removed, the whole of the body is of a bright vermillion colour. They seem to differ from *P. phantopus* of Linnæus, but may be only a variety of that species.

Montreal, 14th May, 1859.

CATALOGUE OF COLEOPTERA COLLECTED BY MR. ROBERT BELL, 1858.

Cicindela longilabris, Say.—Green Island Seigniory, between Metis and Lake Matapedia, and Ste. Anne.

" *vulgaris*, Say.—Ste. Anne, Ruisseau de la Grande Vallée, and between Metis and the mouth of the Matapedia.

" *duodecimguttata*, Dej.—Metis River, between Metis and the Matapedia, and Ste. Anne.

" *Baltimorensis*, Herbst. (*repanda*, Say).—Rimouski, Metis River, and Capuchin.

Brachinus, (not determined).—Abundant at Metis River.

Cymindis reflexa, Lec. (*marginata*, Kirby).—Rivière du Loup, Rimouski, Metis, and Matanne.

Calathus gregarius, Say.—St. Simon, from the mouth of the Marcouin to the Shick Shock Mountains, 14 miles up that river, and Mount Commis on the Metis.

Platynus sinuatus, Dej.—Point Levi, St. Simon, and Marcouin River.

" *extensicollis*, Say.—Metis River.

" *meldnarius*, Dej.—Point Levi opposite Quebec.

" *tenuis*, Say.—Berthier and Ste. Anne.

" *cupripenne*, Say.—Point Levi, St. Simon, and Ste. Anne.

" *retractus*, Lec.—Berthier, Rivière du Loup, and Ste. Anne.

" *picipennis*, Kirby, (*lenum*, Lec.)—Berthier, Marcouin River, and between Metis and the Matapedia.

" *lutulentus*, Lec.—Point Levi.

" *placidus*, Say.—Berthier, Matanne, and Ruisseau de la Grande Vallée.

Fœcilus lucublandus, Say.—Very abundant at Point Levi, Berthier, Rivière du Loup, Green Island Village, St. Simon and Metis.

Pterostichus erythropus, Dej.—Point Levi.

" *patruelis*, Dej.—Green Island Seigniory.

" *mandibularis*, Kirby.—Between the mouth of the Marcouin and the Shick Shock Mountains.

" *caudicalis*, Say.—Berthier and Green Island Seigniory.

" *corvinus*, Lec.—Point Levi.

" *orinomum*, Leach. (*vitreus*, Esch.)—Abundant from Rivière du Loup to Ste. Anne, and Mount Commis on the Metis.

" *Luczotii*, Dej. (var. præc. ?)—Metis and Ste. Anne.

" *adjunctus*, Lec.—Rivière du Loup to Ste. Anne.

Amara libera, Lec.—Rivière du Loup.

" *pallipes*, Kirby, (*depressa*. Lec.)—Rimouski.

" *impuncticollis*, Say.—Berthier and Ste. Anne.

" *fallax*, Lec.—Green Island Seigniory and Matanne.

" *interstitialis*, Dej.—Rimouski and Matanne.

Anisodactylus Harrisii, Lec. (*agricola*, fide Harris).—Point Levi and Berthier.

Harpalus viridiæneus, Beauv.—Very abundant at Green Island Seigniory, between Metis Lake and the Matapedia, Matanne, and Ste. Anne.

" *pleuriticus*, Kirby.—Abundant from Berthier to Rimouski.

" *megacephalus*, Lec.—Rivière du Loup.

" *rufimanus*, Lec.—St. Anne.

Chlænius sericeus, Say.—Point Levi, Berthier, and St. Simon.

" *chlorophanus*, Dej.—Metis River.

" *tricolor*, Dej.—Berthier.

Cychrus (*Sphæroderus*) *Brevoortii*, Lec.—Rivière du Loup, St. Simon, Mount Commis, 20 miles up Metis River, Ste. Anne, and Marcouin River.

Carabus serratus, Say.—Rivière du Loup to Matanne, and between Metis and the Matapedia River.

" *Lapilayi*, Lec.—Rivière du Loup and Green Island Seigniory.

Calosoma calidum, Fabr.—L'Islet, Rimouski, Metis, Matanne, and Ste. Anne.
Elaphrus californicus, Mann. *var. punctatissimus*, Lec.—St. Simon.
Patrobus longicornis, Say.—Berthier, Metis, and mouth of the Matapedia.
" *angicollis*, Randall.—Metis River.
Bembidium dilatatum, Lec.—Metis River.
" *lucidum*, Lec.—Point Levi.
Dytiscus confluens, Say. (*O. oligbukii*, Kirby.)—Mouth of Metis River.
Agabus striatus (?), Say.—Rivière du Loup, Green Island Seigniory, and Ste. Anne.
Necrophorus velutinus, Fabr.—Metis River.
Silpha lapponica, Herbst.—Very abundant at Ste. Anne.
Staphylinus villosus, Grav.—Rimouski, Metis, Matanne, and Ste. Anne.
Omosita colon, Fab.—In vast numbers in fields manured with Capelin.
Pediacus planus, Lec.—Between Metis and the Matapedia.
Byrrhus picipes, Kirby.—Ste. Anne.
Platycerus depressus, Lec.—Ste. Anne.
Aphodius fossor, (" absolutely the same as the European," Leconte, in lit.) —Rivière du Loup and Ste. Anne.
" *fimetarius*, Fabr.—Abundant from Metis to the Matapedia.
" *N. sp.* (?).—Metis.
Lachnosterna fusca, Fröhlich.—Point Levi and Rivière du Loup.
Dichelonycha subvittata, Lec.—Ste. Anne.
Ancylochira maculiventris, Say.—Metis River, and between Metis and the Matapedia.
Ellychnia corrusca, Dej.—Capuchin, Ste. Anne, and Ruisseau de la Grande Vallée.
Meloe rugipennis, Lec.—Between Metis and the mouth of the Matapedia.
Serropalpus substriatus, Hd.—Metis River.
Upis reticulata, Say.—Metis.
Tomicus (not named).—Between Metis and the Matapedia.
Physocnemum ligneum, Fabr.—Green Island Seigniory.
Monohammus confusor, Kirby.—Metis.
" *scutellatus*, Say.—Metis and Ste. Anne.
Chrysomela scalaris, Lec.—Metis.
Galleruca (not named).—Between Metis and the Matapedia.
Coccinella novemnotata, Fabr.—Rimouski and Metis.

NOTE.—The species in the above catalogue were most kindly determined for me by Dr. J. L. Leconte, and great confidence may therefore be placed in it. A considerable number of species besides the above were also collected by Mr. Bell, but were unfortunately destroyed on the journey to Phildelphia.

W. S. M. D'URBAN.

CATALOGUE OF LEPIDOPTERA COLLECTED BY MR. ROBERT BELL, 1858.

RHOPALOCERA.

Papilio Turnus, Linn.—Extremely abundant at Ste. Anne and along the coast from Cape Chatte to Martin River, from June 18th to the end of July, frequently assembling round muddy places in great numbers.

Colias philodice, Godart.—Abundant at Cape Chatte and Ste. Anne from June 10th to the middle of July. A few were observed between Metis and Lake Matapedia and at Campbellton, at the mouth of the River Ristigouche in August. It was very numerous at the mouth of the Matapedia on 27th August and was last seen on the Ristigouche on 1st September.

Pieris oleracea, Harris.—Observed at St. Simon on May 28th. Common at Ste. Anne from June 20th to the middle of July.

Limenitis arthemis, Drury.—One specimen was taken at Ste. Anne on July 10th, and another was observed on Marcouin River July 26th.

Cynthia cardui, Linn.—Two specimens only were met with; the first in the Seigniory of Grand Metis, August 16th. and the second near Dalhousie, N. B., August 25th.

Vanessa J. album, Boisduval.—Two specimens taken on the Patapedia River at its junction with the Awaganissis, September 12th.

" *antiopa*, Linn.—One specimen taken at Metis, and another near Rimouski, September 29th. It was not observed elsewhere.

Grapta progne. Fab.—Frequently met with from Rivière du Loup to Ste. Anne from May 18th to July 19th. Very abundant at Lake Matapedia August 17th, and all along the Ristigouche and Patapedia Rivers up to September 12th.

" *C. aureum*, Cramer (?).—One specimen taken at the mouth of the the Awaganissis Brook

Argynnis aphrodite, Fab.—First observed at Ste. Anne on the 20th June, and was very abundant there for the next month. It was also observed at the Marcouin River, between Metis and Lake Matapedia, at the mouth of the Matapedia, on the Ristigouche, and lastly, at the mouth of the Awaganissis September 12th.

" *Myrina*, Cramer.—Not uncommon at Ste. Anne about the end of June and beginning of July. It was also observed between Metis and Lake Matapedia August 16th.

" *Bellona*, Godart.—One specimen at the mouth of the Matapedia River August 27th.

Melitæa Tharos, Cramer.—A few specimens of this species were taken at Ste. Anne at the beginning of July.

Polyommatus pseudargiolus, Boisd.—Numerous at Rivière du Loup May 19th, and from thence to Chatte River June 18th.

Hesperia ————(?).—Numerous about Metis August 13th, and at Lake Matapedia August 17th.

HETEROCERA.

BOMBYCINA.

Orgyia ———— —Matapedia River August 20th.

Ctenucha Latreillana, Kirby.—In great abundance at Ste. Anne July 20th.

Phragmatobia fuliginosa, Linn.—Matan June 12th, not common.

NOCTUINA.

Mamestra ————.—Ste. Anne.

Plusia ————.—Common in Gaspé and on the Ristigouche.

GEOMETRINA.

Five species of undetermined genera.

PYRALIDINA.

Pyralis (?) ————.—Mouth of the Matapedia River.

Crambus ————.—Very abundant in meadows at Ste. Anne, and at the mouth of the Matapedia.

CATALOGUE OF PLANTS COLLECTED BY MR. ROBERT BELL, 1858.

Ranunculaceæ.

Anemone Pennsylvanica, Linn. In full flower August 12th, Metis.

Thalictrum Cornuti, Linn. In full flower July 16th, Ste. Anne.

Ranunculus repens, Linn. " " " "

" acris, Linn. " " " "

" (undetermined). No flower, September 1st, River Ristigouche.

Caltha palustris, Linn. In full flower June 5th, Rimouski.

Aquilegia Canadensis, Linn. In full flower May 16th, L'Islet.

Nymphæaceæ.

Nuphar advena, Ait., (a very small form). In full flower August, West end of Lake Metapedia.

Sarraceniaceæ.

Sarracenia purpurea, Linn. In full flower June, Ste. Anne.

Fumariaceæ.

Corydalis aurea, Pursh. In full flower August 30th, Ristigouche River.

Cruciferæ.

Sinapis arvensis, Linn. In full flower July 11th, Ste. Anne.

Violaceæ.

Viola cucullata, Ait. In full flower May 30th, St. Simon.

Cistaceæ.

Hudsonia tomentosa. Nutt. In full flower August 31st, River Ristigouche.

Parnassiaceæ.

Parnassia Carolinianum, Michx. In full flower August 30th.

Caryophyllaceæ.

Silene inflata, Smith. In full flower July 6th, Ste. Anne.

Mœhringia lateriflora, Linn. In full flower July 23rd, Portage between Martin and Marcouin rivers.

Spergula arvensis, (?) Linn. No flower Augnst 12th, Metis.

Oxalidaceæ.

Oxalis acetosella, Linn. Very abundant all up the River Marcouin.

" stricta, Linn. Going to seed August 30th, River Ristigouche.

Anacardiaceæ.

Rhus Toxicodendron, Linn. Fruit ripe August 31st, River Ristigouche.

Sapindaceæ.

Acer spicatum, Linn. Abundant everywhere on low land; just out of flower July 5th, Ste. Anne. In seed Sept. 11th, mouth of the Awaganissis brook.

" saccharinum, Wang., (Hard Maple). On rich soil only.

Leguminosæ.

Trifolium repens, Linn. Abundant round clearings, &c., throughout the district.

Desmodium Canadense, D. C. In full flower August 12th and 31st, River Ristigouche.

Vicia Cracca, Linn. In full flower July 11th, Ste. Anne.

Lathyrus palustris, Linn. In full flower, August 4th, mouth of the Marcouin.

Oxytropus Lamberti, (?) Pursh. In full flower August 31st, River Ristigouche.

Rosaceæ.

Prunus pumila, Linn. Fruit nearly ripe August 31st, River Ristigouche.

" Pennsylvanica, Linn. Abundant throughout the counties of Rimouski and Bonaventure.

" Virginiana, Linn. Fruit ripe Sept. 1st, River Ristigouche.

Agrimonia Eupatoria, Linn. In seed August 21st, Fifteen miles up the River Matapedia.

Potentilla Anserina, Linn. In full flower August 4th, mouth of the River Marcouin.

Fragaria Virginiana, Ehrhart. Grass land throughout the district. Fruit ripe beginning of July, at Ste. Anne.

Rubus triflorus, Rich. Fruit ripe July 12th, Ste. Anne; mouth of the Awaganissis.

" strigosus, Miche. Extremely abundant on burnt land and about fences throughout the district.

Rosa blanda, Ait. In blossom, July 5th and 20th at Ste. Anne, and August 12th at Metis.

Cratægus tomentosa, Linn. River Ristigouche.

Pyrus Americana, D. C. Moderately abundant throughout the district.

Onagraceæ.

Epilobium augustifolium, Linn. In full flower July, 16th Ste. Anne.

" coloratum, Muhl. In seed July, three miles up the River Marcouin.

Œnothera biennis, Linn. In full flower July 11th, Ste. Anne, and August 30th, mouth of the River Matapedia.

Circæa alpina, Linn. In flower July 31st, mouth of the River Marcouin.

Saxifragaceæ.

Mitella nuda, Linn. Seed ripe July, three miles up the River Marcouin.

Umbelliferæ.

Heracleum lanatum, Michx. In full flower July 16th, Ste. Anne.

Sium lineare, Mich. In full flower August 12th, Metis.

Cornaceæ.

Cornus Canadensis, Linn. In full flower July 5th, Ste. Anne.

" stolonifera, Michx. In full flower June, Ste. Anne.

Caprifoliaceæ.

Linnea borealis, Gronov. In full flower June, Ste. Anne, and abundant everywhere.

Lonicera ciliata, Muhl. In fruit July 30th, Marcouin river.

Diervilla trifida, Mænch. In full flower August 30th, River Ristigouche.

Sambucus Canadensis, Linn. Abundant on low land.

Viburnum opulus, Linn. In full flower July 16th, Ste. Anne.

Compositæ.

Eupatorium purpureum, Linn. In full flower Sept. 3rd, mouth of the River Patapedia.

" ageratoides, Linn. In full flower July 31st, mouth of the River Marcouin, and August 30th, River Ristigouche.

Aster miser, Linn., Ait. In full flower August 12th, Metis.

" simplex, (?) Willd. " " " " "

" longifolius, (?) Lam. " " " " "

Diplopappus umbellatus, Torr. and Gr. In full flower June 30th, mouth of the River Matapedia.

Solidago bicolor, Linn. Going out of flower August 30th, River Ristigouche.

" Canadensis, Linn. In full flower August 12th, Metis.

Achillea Millefolium, Linn. In full flower July 11th, St. Anne, and mouth of the Awaganissis, September.

Leucanthemum vulgare, Lam. In full flower July 4th, Ste. Anne, and August 30th, River Ristigouche.

Cirsium Muticum, Michx. In full flower August 30th, mouth of the River Matapedia.

" pumilum (?), Spreng. Out of flower August 30th, River Ristigouche.

Hieracium Canadense, Michx. In full flower August 30th, River Ristigouche.

Nabalus racemosus, Hook. ("variety with truncate and obcordate leaves," G. B.) August 30th, River Ristigouche.

Lobeliaceæ.

Lobelia Kalmii, Linn. In full flower August 30th, River Ristigouche.

Campanulaceæ.

Campanula rotundifolia, Linn. In full flower August 4th, mouth of the River Marcouin, and Aug. 30th River Ristigouche.

Ericaceæ.

*Vaccinium Pennsylvanicum, (?) Lam. In great profusion on hills which have been burnt over.

Chiogenes hispidula, Torr. and Gr. In great abundance throughout the district.

Andromeda polifolia, Linn. In full flower July 16th, Ste. Anne.

Pyrola rotundifolia, Linn. " " " " " "

Plantaginaceæ.

Plantago maritima, Linn. In full flower August 4th, mouth of the River Marcouin.

Primulaceæ.

Primula farinosa, Linn. Abundant all along the southern shore of the Gulf. In full flower end of May and June.

Lentibulaceæ.

Utricularia vulgaris (?) Linn. Metis.

Scrophulariaceæ.

Chelone glabra, Linn. In full flower August 12th, Metis.

Veronica Americana, Schweinitz. Nearly out of flower July 12th, Ste. Anne.

Pedicularis Canadensis, Linn. In full flower August 10th, Matanne.

Labiatæ.

Lycopus Virginicus, Linn., (a very coarse form). In flower August 30th, River Ristigouche.

Brunella vulgaris, Linn. In flower, July 11th. Ste. Anne.

Scutellaria nervosa, Pursh. In flower August 12th, Metis.

Borraginaceæ.

Mertensia maritima, (?) Don. In flower beginning of July, Ste. Anne.

Apocynaceæ.

Apocynum androsæmifolium, Linn. In full flower August, between Metis and Lake Matapedia.

Asclepiadaceæ.

Asclepias Cornuti, Decaisne. Abundant all along the Ristigouche.

Oleaceæ.

Fraxinus sambucifolia, Lam. (Black Ash). In valleys, and along the shores of the Lakes.

Polygonaceæ.

Rumex Acetosella, Linn. Coming into flower July 16th, Ste. Anne.

Urticaceæ.

Ulmus Americana, Linn., (Swamp Elm). Very abundant, and of large size, along the River Ristigouche.

Cupuliferæ.

Corylus rostrata, Ait., (Hazel nut). Marcouin River.

Betulaceæ.

Betula papyracea, Ait., (White Birch). The most abundant deciduous tree throughout the eastern peninsula, and reaching a large size.

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* This Blueberry is very useful to the Micmac Indians, who are said to preserve the fruit in dried cakes for winter use.

Betulaceæ.

Betula excelsa, Ait., (Yellow Birch). Most abundant round Lake Matapedia, and in the valleys of the Rivers Marcouin and Ristigouche; generally associated with Hard Maple on rich soil.

Alnus incana, Willd., (Alder.) Everywhere bordering the streams and rivers, forming dense thickets.

Salicaceæ.

Populus tremuloides, Michx. (Common Poplar). Abundant on high lands.

" balsamifera, Linn. (Balsam Poplar, Balm of Gilead.) Abundant on the borders of rivers and lakes.

(No Willows were collected).

Coniferæ.

Pinus resinosa, Ait., (Red Pine). Abundant, but of small size, along the upper part of the River Patapedia.

" strobus, Linn., (White Pine). Abundant everywhere.

Abies balsamea, Marshall, (Balsam Fir). Very abundant.

" nigra, Poir., (Black Spruce). Principal and in many places the sole tree covering the hilly country of the eastern peninsula.

" Alba, Michx., (White or "Sea Spruce" of the Indians). The commonest tree along the coast and rivers.

Larix Americana, Michx., (Tamarack). Rather scarce, but occurring in every variety of situation throughout the district.

Thuja occidentalis, Linn., (White Cedar). Very abundant in the vallies of all the rivers, reaching a large diameter, but no great height.

Taxus baccata, Linn., var. Canadensis, (Ground Hemlock). Abundant amongst trees on low ground.

Alismaceæ.

Sagittaria variabilis, Engelm. In full flower August 15th, Metis.

Orchidaceæ.

Platanthera flava, Gray. In full flower September 1st, River Ristigouche.

" psycodes, Gray. In full flower August 17th, West end of Lake Matapedia.

Spiranthes decipiens (?) Hooker. Coming into flower July 30th, Marcouin river.

Corallorhiza Macræi, Gray. Going to seed July 31st, Three miles up the River Marcouin.

Iridaceæ.

Iris versicolor, Linn. In full flower July 4th, Ste. Anne.

Sisyrinchium Bermudiana, Linn., (variety mucronatum, Gray). In flower July 16th, Little St. Anne.

Smilaceæ.

Trillium erectum, Linn., (very large). Fruit ripe July 31st, Three miles up the Marcouin river.

Liliaceæ.

Smilacina stellata, Desf. In full flower June, Ste. Anne.
" bifolia, Ker. In seed, but not ripe, July 20th, Marcouin river.
Clintonia borealis, Raf. Throughout the district.

Melanthaceæ.

Streptopus roseus, Michx. In full flower June, Ste. Anne.
Tofielda glutinosa, Willd. Seed ripe August 30th, River Ristigouche.

Cyperaceæ.

Eriophorum vaginatum, Linn. Ste. Anne.

Gramineæ.

Phleum pratense, Linn., (Timothy). Very abundant everywhere.
Calamagrostis Canadensis, Beauv. Shick Shock Mountains.
Elymus Canadensis, Linn. River Ristigouche.
Avena striata, Michx. (Trisetum purpurascens, Torr.) Shick Shock Mountains.

Equisetaceæ.

Equisetum pratense, Ehrh. Metis.

Filices.

Asplenium Felix-fœmina, R. Br. Mouth of the Awaganissis brook.
Aspidium spinulosum, Swartz. " " " "
Osmunda regalis, Linn. Round Metis Lake, &c.
Botrychium Virginicum, Swartz. Fertile fronds ripe July 28th, River Marcouin.

Lycopodiaceæ.

Lycopodium lucidulum, Michx. In fruit Sept. 1st, River Ristigouche.
" dendroideum, Michx. " " " "
" clavatum, Linn., " " " "
" complanatum, Linn. " " " "

Musci.

Polytrichum commune, Linn.
Hypnum splendens, Hedw.
" Schreberi, Willd.
" Crista-Castrensis, L.
" reptile, Michx.
} Collected on the River Marcouin.

Lichenes.

Peltigera aphthosa (?) Hoffen, infert.
Sticta pulmonaria, Ach.
} River Marcouin.

Note.—In drawing up the above Catalogue of Plants, collected by Mr. Robert Bell, in the counties of Rimouski, Gaspé and Bonaventure, in the eastern peninsula of Lower Canada, I derived much assistance from George Barnston, Esq., of the Hon. Hudson's Bay Company, who obligingly determined for me all those species about which I was in doubt. The list, from unavoidable circumstances, is not so extensive as could be wished, but it will be found to contain some very interesting species.

It is remarkable that no Oak, White Ash, Basswood, Soft Maple, Beech, Butternut, and Hemlock Fir, were observed in this district.

W. S. M. D'Urban

Montreal, 14th May, 1859.

ARTICLE XIX.—*Observations on the Natural History of the Valley of the River Rouge, and surrounding Townships in the Counties of Argenteuil and Ottawa.* By W. S. M. D'URBAN.

On the 13th May, 1858, I left Montreal for Grenville on the Ottawa, to accompany a Geological Surveying party, under the immediate direction of Sir W. E. Logan, Provincial Geologist, with whom I remained in the field until the middle of October. Having received instructions to collect specimens, and make observations in Natural History, as far as possible without interfering with the primary objects of the expedition, I did so, and the following notes are the results of my labours. They include lists of the *Mammalia*, *Birds*, *Reptiles*, *Fish*, *Insects*, *Mollusks* and *Plants*, observed in the Townships of Grenville, Chatham, Wentworth, Harrington, Montcalm, Arundel, De Salaberry and Grandison, in the County of Argenteuil, and some unsurveyed parts of the County of Ottawa. With the exception of the immediate neighbourhood of the town of Grenville, which stands on the Chazy Limestone, the whole country traversed lies on the Laurentian formation, and these lists, confessedly imperfect, however, from the limited means at my command, may be considered as a fair illustration of the Fauna and Flora, of a part of the Laurentian region of Canada. There is no correct map of the above named Townships yet published, excepting a portion including the first four, which are accurately laid down in the "Plan, showing the distribution of the Crystalline Limestone of the Laurentian series in various townships between Grenville and Rawdon," published in the Report of the Geological Survey for 1853–56, but the general position of the remainder and the course of the Rouge may be seen by consulting the map prepared by Mr. Keefer, C.E., for the "Canada Directory," for 1857–8.

Our route lay, on leaving Grenville, in a north easterly direction through the Townships of Grenville, Harrington and Wentworth, till we reached a fine sheet of water, named, from the number of the islands on it, "Sixteen Island Lake." It is about eighteen miles in a straight line N. 13°E. from Grenville, and lies in the Townships of Wentworth and Montcalm. Here we were camped for several weeks, making numerous excursions through the neighbouring country. About the middle of June we commenced following a chain of

small lakes, which led us in a westerly direction from Balsam or Chain Lake, a mile to the north of Sixteen Island Lake, through the township of Montcalm, to a beautiful piece of water known as Bevin's Lake in direct communication with the Rouge by a stream of considerable size and upwards of two miles in length. At the beginning of July we began the ascent of the river Rouge, thoroughly exploring the country on either side as we ascended, as far as the Messrs. Hamilton Brothers' excellent farm, the first of three, each 25 miles apart, maintained to aid the lumbering operations conducted by the firm on this river. It is situated about fifty miles from the junction of the Rouge with the Ottawa, on a level tract, composed of drift and fluviatile deposits, showing several terraces rising one above the other, marking ancient channels of the river, and the splendid crops and cattle which we saw, bore unequivocal testimony to the fertility of the soil when properly cultivated. Here we camped on the 21st August, having however previously visited it on several occasions. I remained there till the first week in September, when I made an excursion of ten days' duration, to the Trembling Mountain, a fine range upwards of 2,000 feet in height, rising from the shores of a most beautiful Lake nearly seven miles in length, lying partly in the township of Grandison and about five miles from Hamilton's Farm, which is in the County of Ottawa. We were next occupied in the survey of the Lake of Three Mountains in the County of Ottawa, and the long chain of Lakes connected with it, the outlet to which is a narrow creek several miles in length, running into the Rouge about two miles below the farm. This engaged our attention until the 7th October, when we returned to the farm, and on the 11th I descended the Rouge, reaching Grenville the next day, but was employed for a week traversing the country backwards and forwards, between that town and Bevin's Lake, with the baggage of our party. My observations concluded with my return to Montreal on the 19th October.

VERTEBRATA.

MAMMALIA.

The Mammalia of this district are not numerous, the Algonquin or Two Mountain Indians settled on the Rouge having long ago killed or driven away all the larger animals, and the number of Lumbermen and Surveying parties going up and down the river

at different seasons of the year, contribute to render them scarce in its immediate neighbourhood. The following are all the species observed or concerning which I could obtain any information.

1. *Vespertilio subulatus*, Say, (Say's Bat).—One specimen was shot on the 8th August, in the day time, and on the 10th I saw several flying about in the hottest part of the afternoon, over the Rouge, and every now and then dashing into the water. Bats were numerous throughout the district, and as they varied considerably in size there were probably several species, but from the difficulty of obtaining specimens the present is the only one which I could determine. In the township of Harrington, Bats continued abroad at dusk as late as 17th October.

2. *Ursus Americanus*, Pallas, (Black Bear).—Although none were seen by us, Bears appear to be numerous in the district, more especially about the settlements in autumn, when they are very destructive to the settler's crops and pigs, and are occasionally taken in large iron spring-traps. They are rarely seen in the woods during the summer, but are sometimes killed by the Indians when found in their winter retreats. We however frequently met with recent traces of them, such as trees torn by their claws and stripped of the bark all round the trunks, marks of their teeth, fresh dung, &c., in the townships of Wentworth, Montcalm and Arundel, and on the 15th October I saw a settler greasing the axle-trees of his cart with the fat of one which had been killed a few days previously in the township of Chatham. Near Bark Lake in the 5th and 6th Ranges of Arundel, I observed the marks left by a Bear's teeth on the trunk of a cedar full five feet from the ground. The Indians always examine the bite of this animal on a tree, and imagine that if its teeth have penetrated to the wood it will not be killed that year, but should they have merely entered the bark, he will soon meet with his death.

3. *Mustela Martes*, Linn. (Pine Marten).—Does not appear to be very plentiful. I saw but one which had just been trapped October 10th, at Hamilton's Farm.

4. *M. Canadensis*, Schreber (Fisher).—Reported common about Hamilton's Farm, and I saw one which was shot there October 10th. They are caught in fall-traps made by cutting a square hole in the trunk of a hollow cedar, a few feet from the ground, in which the bait (a piece of fish, the head of a partridge, or part of a squirrel) attached to a trigger, supporting the but-end of a

heavy pole, is placed, this animal being so powerful that it easily tears to pieces the log-traps used for the next species.

5. *Putorius Vison*, Gmel (Mink).—Abundant throughout the district. Their "roads" run round the margin of every lake, and the "portage paths" of the Indians generally follow those these little animals form in their constant passage from one lake to another. It is surprising, considering the number of "log-traps" set for them in these paths over the whole country, the facility with which they are caught, and the eagerness with which they are sought after, that any escape. The skins sell for $2 each, and were formerly worth $2.50. The season for trapping them is the end of September and October. The traps are contructed by driving slabs, split out from a cedar tree, or small stakes into the ground in a circle, leaving a narrow entrance on one side, across which a fir-pole heavily weighted is placed, and so arranged as to fall and crush the animal when the bait inside the circle of sticks is disturbed. The top is covered over with a handful of branches, which prevents the Mink from reaching the bait except by the narrow entrance. As soon as taken, an opening having been made near the tail, the skin is stripped off inside out, and stretched till dry, on three splints of cedar-wood cut to fit accurately together on the principle of a boot-tree. When alarmed, this animal takes to the water, swimming and diving with great readiness, though it can continue but a short time under water. The young are born in June.

6. *Mephitis Chinga*, Tiediman, *Americana*, Sabine, (Skunk). Common about the settlements in Grenville, &c.

7. *Lutra Canadensis*, Sabine, (Otter).—Many seen in the lakes throughout the district. Living entirely on fresh fish which its extraordinary powers of diving enable it to obtain with facility, the Otter will not take any bait, but is captured by means of iron spring-traps without teeth, set at the water's edge in spots where it is in the habit of going in and out of the water. These landing places or "Otter-slides" are usually situated where the shore is pretty steep, and the well-beaten track is always very conspicuous. Unless the trap is firmly secured with a chain or very strong cord, this powerful animal frequently carries it off, but is generally soon drowned by it, and sinks to the bottom where it is not easily found. The skins I was informed are sold at from four to six dollars each.

8. *Vulpes fulvus*, Desm. (Red Fox).—None seen, but reported

common. At the Indian Village on the Rouge, 16th Lot, 7th Range, Arundel, several half-grown puppies were pointed out to us as the offspring of a fox and dog. They very much resembled the fox, and were remarkably gentle and docile in manner, being much petted by the kind-hearted Squaws.

9. *Castor fiber*, Linn. (Beaver).—Though ancient dams made by Beavers were frequently met with in the lakes we visited in Wentworth, Montcalm, Arundel, and De Salaberry, they appear to be nearly extinct in those townships. In a small lake near the Lake of Three Mountains, however, we found fresh branches of the yellow birch, the aromatic bark of which constitutes their winter food, showing the marks of their teeth. The Indians reported them as numerous about forty miles above Hamilton's Farm, and had many skins in proof of their assertion. I was informed that the price of these skins was from five to nine shillings per lb.

10. *Fiber Zibethicus*, Cuvier, (Muskrat).—Very numerous throughout the district. Their food consists of the roots of water-plants and the fresh-water mussels (*Unio complanatus* and *Anodonta*), of which they collect large quantities about their holes in clayey banks of the lakes and rivers, where they leave them in the sun till the shell opens, when they can easily extract the animal. At the beginning of October they commence constructing, on some sunken log or in a shallow place a few yards from the shore, their winter-nests, which are composed of the roots of *Equiseti* and other water-plants torn up from the bottom, and placed in a cirular heap, in the centre of which they form a cavity and pass the winter within it in a torpid state. The Indians trap great numbers at the end of September and beginning of October, and the skins turned inside out, are stretched on bent sticks.

11. *Arctomys Monax*, Linn. (Woodchuck).—Said to be common about the clearings in Grenville, and a specimen was given to me which had just been killed in the 6th Range of that township, May 14th.

12. *Tamias Listeri*, Ray, (Chipmunk).—A few only were seen in the woods of Montcalm, and about Hamilton's Farm.

13. *Sciurus Hudsonius*, Pennant, (Red Squirrel).—Very numerous in the woods throughout the district, and sometimes so tame as to run between our legs. The seeds of the white cedar (*Thuja occidentalis*) are its favourite food, and large heaps of the scales, stripped by it from the cones, may be seen in every

cedar-swamp. In September they feed much on the young seeds of the white pine, and it is somewhat amusing to see a Squirrel running up a tree with a green fir-cone as long as its body sticking out of its mouth, as a man would carry a cigar. They not unfrequently take to the water, crossing from one side of the river to the other, and are then easily captured.

14. *Hystrix dorsata*, Linn., *pilosus*, Catesby, (Porcupine).—I observed some bundles of quills of this animal in an Indian canoe coming down the river, so I suppose it occurs in the district, though we saw none.

15 *Lepus sylvaticus*, Bachman, *Americana*, Erxlebein, (Hare). Common in the woods though not often seen. On the 11th October, on our way down the Rouge, one was killed on a sand-bank, where it had been surprised by the rapid rise of the river during the night.

16. *Cervus alces*, Linn. (Moose).—Judging from the quantity of dried Moose-meat which the Indians coming down the Rouge had in their possession, this animal must be tolerably numerous above Hamilton's Farm, but none were seen in the district we passed through.

17. *C. Virginianus*, Gmel. (Common Deer).—Tracks frequently met with, and two deer were reported to have been seen near Sixteen Island Lake. The Indians say that this animal is very fond of the leaves of *Kalmia angustifolia*, from eating which they become intoxicated, and are then easily killed.

18. *C. tarandus*, Linn. (Caribou).—One was shot September 1st on Hamilton's Farm, while we were camped there, and was the only one seen by us. I however, observed traces of them on Trembling Mountain, the Gneiss rocks of which are clothed with abundance of its peculiar food, the Reindeer-moss (*Cladonia rangeferina*). The hoofs of this animal are remarkably large and flat, and it is thus enabled to pass easily over the deepest snow.

Besides the animals above enumerated, I may mention the Raccoon, *Procyon lotor*, which was spoken of by the Indians as being found in the district; a Wild Cat, (*Lynx Canadensis*) was supposed to have been heard at night in the township of Montcalm; a Flying Squirrel, (*Pteromys volucella?*) is said to occur, and near the Lake of Three Mountains I had a momentary view of a small *Arvicola* of some species.

AVES.

The following list of Birds is as complete as I could make it, under the circumstances, but doubtless many species are omitted, especially amongst the Warblers, their restlessness and the rapidity of their movements, together with the thickness of the foliage in the woods, rendering it difficult to recognise the species. Several Hawks, which I could not determine, were also seen besides those enumerated.

The migration of the smaller insectivorous birds was very remarkable, and for several days towards the end of May, at Sixteen Island Lake, there were literally thousands of Warblers of several species, on their passage northward, flitting about from tree to tree, and on 28th August at Hamilton's Farm great numbers were again seen on their return South, as is noticed below under the respective species. During the middle of summer, however, but very few Warblers, or indeed birds of any kind were to be seen, and those observed were generally in the neighbourhood of the clearings, perhaps because they were there more easily noticed than in the thick woods. At the beginning of September vast flocks of Ducks were often seen flying high in the air towards the south, but owing to the great depth and the rocky character of most of the lakes, the only species of *Natores*, which were at all numerous on them, were such as feed entirely on fish.

The Nomenclature and Arrangement are in accordance with Audubon's "Synopsis of the Birds of North America."

1. *Buteo* —— *?*—A Buzzard of some species was frequently seen throughout the district traversed, often hovering round our camps, attracted by the remains of fish, &c., lying about. As it always kept out of shot I was not able to determine the species.

2. *Pandion Haliætus*, Linn. (Osprey, or Fish Hawk).—On the 21st May I had the pleasure of visiting Lake St. Jean, a small piece of water upwards of a mile in length, situated in the eighth and ninth Ranges of the township of Montcalm and about one mile S.S.E. of Sixteen Island Lake. Here a pair of Ospreys had for many years held undisputed possession of their nest, which they had built on the summit of a large, dead, and isolated pine-tree, standing a short distance from the water, on a small rocky islet near the middle of the lake, and forming a most conspicuous object. There were no other trees on the island, which however was thickly clothed with tall birch and alder bushes. No better site could have been chosen for their nest, as the wary birds

could command a view from it of the whole lake, and observe the approach of every foe. Late in the evening I endeavoured to obtain the only bird to be seen near the nest, but it was so extremely shy, circling high in the air round the tree far out of shot, that after several ineffectual attempts, I gave it up, till early on the following morning when I again visited the spot. Both birds flew off the nest the moment they perceived my approach in the canoe, and their hurried, startled flight was very peculiar and unlike that of any other hawk I ever saw. Having hid myself in the bushes at the foot of the tree, I sent the canoe with the two men who had brought me there, to the end of the lake, and in a few minutes the male-bird, supposing we had all left the place, returned and pitched on a branch near the top of the pine. I instantly fired one barrel, but although apparently hard struck by the shot which knocked out many of his feathers, he flew off. A moment after the female pitched on the same branch, and having fired my remaining barrel loaded with a heavy charge of duck-shot, she dropped from the giddy height at which she was perched with a leg and wing broken, and otherwise much injured. I rushed to secure her, and though so severely wounded, her splendid golden eye never for an instant quailed, and she fought with desperation, rendering it a difficult matter to despatch her. The male-bird flew up the lake and never returned, and I fear he must have died from the effects of my shot. I had the old pine-tree cut down, as the only means of examining the nest, but was greatly disappointed when I found there were no eggs in it. In this secluded lake, shut in by hills thickly clothed with trees, in the gray of the early morning, rendered still more gloomy by a dense drizzling rain which was falling, it was a splendid sight to see the huge scathed pine plunge into the tranquil water, its rotten branches breaking up into a thousand pieces from the shock, dashing up a cloud of spray, and covering the glassy surface of the lake far around, with its fragments. The nest was very large, composed of sticks of considerable size, and lined with dead leaves. The bird which I shot measured nearly five feet across the extended wings. On dissecting it I found the eggs small (none being larger than a small marble), but numerous. The intestines were about the thickness of a goose-quill, and measured seven feet six inches in length. The heart and liver were very large. The head was so much bigger than the neck I had great difficulty in passing the skin over the skull. There was one small intestinal worm in the stomach.

An Osprey was afterwards seen on several occasions, when ascending the Rouge, wheeling about high in the air, and a large nest probably of this bird, was seen on a dead pine on the shore of Trembling Lake. The numerous lakes full of large trout must afford this species abundance of food.

3. *Falco sparverius*, Linn. (American Sparrow Hawk).—One of this pretty species was observed by me at Sixteen Island Lake. When camped on Hamilton's Farm on the Rouge in August, they were very numerous, generally pitching on the burnt pine-trees round the clearing. They were mostly birds of the season. The stomach of an old male I shot on the 28th August, was filled with Grasshoppers, Black Field-Crickets and Coleoptera, all broken up into small fragments. The last seen by me was on the 7th October.

4. *Astur palumbarius*, Linn. (Goshawk).—Several of this large hawk were observed round the clearings of Hamilton's Farm, at the end of August and beginning of September.

5. *A. fuscus*, Gmel. (Sharp-shinned Hawk).—One specimen was seen near Gate Lake in the 6th Range of Wentworth, May 16th; none were observed again till we reached the large farm where the two last species occurred. This was also very numerous there at the end of August, delighting to pitch on the dead pines which thickly stud some parts of the clearings.

6. *Circus cyaneus*, Linn. (Marsh Harrier).—An immature bird of this species was frequently seen at the end of August and in September, about the clearing just mentioned, which being the only one for 25 miles on either side, offers great attractions for most of the hawks which delight in open places, their usual prey generally inhabiting such situations.

7. *Syrnium nebulosum*, Linn. (Barred Owl).—On the 5th September I observed one of this Owl in the woods not far from Trembling Lake, in the township of Grandison.

8. *Otus brachyotus*, Linn. (Short-eared Owl).—I saw a specimen which had just been shot on the 9th October near the house on Hamilton's Farm. I was informed that this species is not uncommon there in the fields after harvest.

9. *Bubo Virginianus*, Gmel. (Great Horned Owl).—Numerous throughout the district and frequently seen.

10. *Chordeiles Virginianus*, Briss. (Night Hawk).—A single individual was observed by me flying about after dusk on the 21st and 26th August, at Hamilton's Farm.

11. *Chœtura pelasgia*, Linn. (Spine-tailed Swift).—Numerous about Grenville, May 13th, and was rather abundant throughout the district during the summer. The last seen by me was on the 25th August at Hamilton's Farm.

12. *Hirundo purpurea*, Linn. (Purple Martin).—Common at Grenville May 13th, but not afterwards met with.

13. *H. bicolor*, Vieill. (White-bellied Swallow).—Abundant at Grenville May 13th. Large flocks were seen flying over the water at Sixteen Island and St. Jean Lakes, May 18th, 22nd and 24th, apparently on their way northwards. One or two were noticed about the middle of August below Hamilton's Farm but none were seen after 25th August.

14. *H. fulva*, Vieill. (Republican or Cliff-Swallow).—Many were noticed about clearings in the townships of Grenville and Harrington, May 14th and 15th; also at Sixteen Island Lake May 24th. None were met with afterwards till reaching Hamilton's Farm, where the last was seen on 21st. August.

15. *Hirundo rustica*, Linn. (Barn Swallow).—Common about clearings and settlers' houses in the townships of Grenville and Harrington May 14th and 15th. Also about the French Canadian Settlement in Wentworth June 4th. It was very numerous nesting in the barns on Hamilton's Farm July 15th, but they were all gone by the middle of August. This species is never met with except in the immediate vicinity of clearings.

16. *Muscicapa tyrannus*, Linn. (Tyrant Fly-catcher).—Observed near Bevin's Lake and on the Rouge, near the Indian Village, 6th Lot, 7th Range, Arundel Numerous about Hamilton's Farm, 25th August, many of them being young birds.

17. *M. acadica*, Gmel. (Small Green-crested Fly-catcher).—A small Fly-catcher apparently this species was observed by me July 1st, on a clearing near Bevin's Lake, Montcalm, and another at Hamilton's Farm August 25th.

18. *Sylvicola coronata*, Lath. (Yellow-crowned Wood Warbler.)—Very numerous about Sixteen Island and St. Jean Lakes Wentworth, May 19th to 24th, after which I did not again notice it till 28th August when it became very numerous about Hamilton's farm, most of them being young birds. The last seen by me was on September 9th, when camped on an island in Trembling Lake.

19. *S. virens*, Lath. (Black-throated Green Wood Warbler).—In numbers with the preceding and following species about Sixteen Island Lake May 24th, but was not again observed by me.

20. *S. Blackburniæ*, Lath. (Blackburnian Warbler).—This beautiful warbler was numerous about Sixteen Island and St. Jean Lakes, in company with the two foregoing species, May 22nd and 24th. I had great difficulty in obtaining specimens, owing to its extremely active habits. The skin of one shot by myself, has been compared by Dr. Dawson with specimens in his possession from Nova Scotia, with which it perfectly agrees, and there cannot therefore be a doubt about the species, though said to be rare in the States.

21. *S. æstiva*, Gmel. (Yellow-poll Wood Warbler).—Observed in the Township of Grenville May 24th, and a few individuals seen about Hamilton's farm August 23rd and 25th.

22. *S. Canadensis*, Linn. (Black-throated Blue Wood Warbler).—First observed at Hamilton's farm August 28th, and abundant during the first week in September there, and at Trembling Lake. About sunrise on the 23rd September, being camped on the Lake of Three Mountains, and the morning cold and frosty, two of this pretty warbler in company with a Wood Thrush, flitted round our camp-fire as though envying the warmth it afforded us, and this was the last date at which I observed it.

23. *S. maculosa?* Lath. (Black-and-Yellow Warbler).—On the 20th July when at the mouth of the Devil's River, in the first Range of the township of De Salaberry, I observed a warbler which I took to be this species.

24. *Certhia familiaris*, Linn. (Brown Tree-creeper).—When I arrived at Gate Lake in the sixth range of Wentworth, on 17th May, a pair of this bird were building their nest with fragments of decayed wood, moss and spider's webs, behind a piece of bark on a dead tree, about six feet from the ground. It is distributed through the whole district, and on the 28th August at Hamilton's Farm was very numerous, flitting from tree to tree in company with *Sylvicola coronata*, *S. Canadensis*, *Parus atricapillus*, *Regulus satrapa*, and *Sitta Canadensis*, *&c.*, which were then migrating south.

25. *Troglodytes hyemalis*, Vieill. (Winter Wren).—Seen occasionally during the whole summer and up to 26th September, at numerous localities throughout the district.

26. *Parus atricapillus*, Linn. (Black-cap Tit).—None of this species were observed till 17th August, when camped about a mile below Hamilton's Farm, and it was not numerous until the 28th, when great numbers made their appearance, and I occasionally observed them in the woods up to the end of September.

27. *Regulus satrapa*, Lich. (American Golden-crested Kinglet).—First observed on 28th August, on which day great numbers were seen in company with several species of warblers, &c. as before mentioned.

28. *Sialia Wilsoni*, Swains. (Common Blue Bird).—One specimen only observed, 14th October, Township of Grenville.

29. *Turdus migratorius*, Linn. (Robin).—Numerous about all clearings throughout the district up to 15th October. A pair had a nest and young, in a tall Elm at the Indian village, Arundel, July 16.

30. *T. mustilinus*, Gmel. (Wood Thrush).—Not uncommon throughout the district up to the end of September.

31. *Seiurus aurocapillus*, Lath. (Golden-crowned Wood-Wagtail).—Very numerous everywhere throughout the district, especially on the borders of lakes.

32. *Alauda alpestris*, Linn. (Shore Lark).—Large flocks were seen at the end of September feeding on the oat stubble at Hamilton's Farm.

33. *Emberiza socialis*, Wils. (Chipping Bunting).—Numerous at Gate Lake May 16th, and not uncommon about all clearings visited by us up to 18th October.

34. *Niphœa hyemalis*, Linn. (Common Snow-bird).—Numerous about clearings and occasionally observed in the woods throughout the district up to 18th October.

35. *Fringilla melodia*, Wils. (Song Sparrow).—About clearings, but not very numerous, throughout the district. I saw young birds nearly full fledged at Grenville on 5th June.

36. *F. Pennsylvanica*, Lath. (White-throated Sparrow).—Very common in the woods throughout the district. On the 15th of August I found a nest of this species on the ground amongst "Ground Hemlock" or Yew. It was composed of bits of decayed wood, and lined with dry grass. It contained two young birds nearly full fledged, one of which was considerably larger than the other. Large flocks, composed principally of birds of the year, assembled in September about the edges of the fields on Hamilton's Farm, feeding on the scattered oats amongst the stubble, and seeking refuge in the bushes when alarmed. Many were so young they were even then hardly full fledged, and became an easy prey to the numerous hawks about the farm.

37. *Erythrospiza purpurea*, Gmel. (Purple Finch).—Heard singing near Balsam or Chain Lake in the Township of Montcalm,

June 14th. Large flocks seen about Hamilton's Farm July 15th.

38. *Coccoborus ludovicianus*, Linn. (Rose-breasted Grosbeak).—Numerous, feeding amongst wheat stubble on the clearings about Gate Lake, May 16th and 17th.

39. *Agelaius phœniceus*, Linn. (Red-winged Starling).—Common in the Township of Grenville May 13th and 15th. Abundant in marshy places about Sugar-bush and Bevin's Lakes in the Township of Montcalm, June and July. Only one observed near Hamilton's Farm.

40. *Icterus Baltimorus*, Linn. (Baltimore Oriole).—Said to have been heard singing June 14th at Chain Lake Montcalm but not seen

41. *Quiscalus versicolor*, Vieill. (Purple Crow-Blackbird).—Observed at Grenville May 14th, but not afterwards noticed.

42. *Corvus Americanus*, Aud. (Common Crow).—Common throughout the district and in large flocks round Hamilton's Farm.

43. *Garrulus cristatus*, Linn. (Blue Jay).—Abundant everywhere, but extremely numerous round Hamilton's Farm in August, flying about in flocks of thirty or forty, and constantly mobbing the small hawks so numerous at that place.

44. *G. Canadensis*, Linn. (Canada Jay, "Carrion-Bird," "Moose-bird").—Abundant; seen only in the woods in summer, but approaches the settlements in Grenville in October. They generally visited our camps in pairs, and were very tame and audacious, their manner of flight resembling that of the Great Shrike, (*Lanius borealis*). This species has a most disagreeable sneaking appearance when seen hopping from branch to branch waiting for a favourable opportunity to make off with a piece of pork. The young are nearly full-grown by the middle of July, and then exactly resemble the figure of *G. Brachyrynchus* in Richardson's "Fauna Boreali Americana."

45. *Vireo olivaceus*, Linn. (Red-eyed Greenlet).—Common throughout the district up to 25th August.

46. *Bombycilla Carolinensis*, Briss. (Cedar Bird, "Cherry-bird").—Not numerous, and only about clearings.

47. *Sitta Canadensis*, Linn. (Red-bellied Nuthatch).—Occassionally seen throughout the district during the summer. First observed May 26th, last seen September the 20th. It was very numerous at Hamilton's Farm on the 28th August for a short time.

48. *Trochilus colubris*, Linn. (Ruby-throated Humming-bird).

—On 27th May when lying on the ground, on an island in Sixteen Island Lake, cleaning photographic plates, a splendid male humming-bird hovered for some minutes within a yard of my face. This was the first date at which I observed it, and it was afterwards occasionally seen up to the 12th August.

49. *Alcedo alcyon*, Linn. (Belted Kingfisher).—Very abundant the whole way up the River Rouge, breeding in holes in the high and precipitous sand-cliffs, which skirt the river in many parts. The young birds were almost full-grown about the middle of July. The last noticed was on the 11th October. It is but rarely seen on the Lakes, though so numerous on the river.

50. *Picus pileatus*, Linn. (Pileated Woodpecker, "Log cock"). —Rather rare in this district. A fine female was shot on Sixteen Island Lake May 27th, and on dissecting it I found the eggs of small size. The stomach and crop were stuffed full of large black wood-ants, and *Elateridous* larvæ. Another was seen on the Rouge August 8th. This fine Woodpecker when seen hopping up the trunk of a tree might easily be mistaken for some animal, its movements being so unlike those of a bird.

51. *P. villosus*, Linn. (Hairy Woodpecker).—Numerous in the woods of the Township of Grenville, Harrington and Wentworth in spring.

52. *P. pubescens*, Linn. (Downy Woodpecker).—Occurred occasionally throughout the district.

53. *P. varius*, Linn. (Yellow-bellied Woodpecker) I shot a fine male, May 27th at Sixteen Island Lake, and saw one or two September 12th and 13th at Trembling Lake.

54. *P. arcticus*, Swains. (Arctic Three-toed Woodpecker).—Observed one specimen in the Township of Harrington, October 15th.

55. *P. auratus*, Linn. (Golden-winged Woodpecker).—None seen till we reached Hamilton's Farm, where it was not uncommon at the end of August, and beginning of September, many being birds of the year. The skin of the neck of this Woodpecker, unlike that of the other species, passes easily over the skull when skinned.

56. *Coccyzus erythropthalamus*, Wils. (Black-billed Cuckoo). Camp on Sugar-bush Lake, 3rd Range Montcalm, June 25th, and Indian Village, Arundel, July 16th.

57. *Ectopistes migratoria*, Linn. (Passenger Pigeon).—A few observed in the woods throughout the district during the spring

and summer, a flock seen at Hamilton's Farm September 3rd, and a solitary specimen remained feeding on the fields there till October 7th.

58. *Tetrao umbellus*, Linn. (Ruffed Grouse, "Partridge").—Abundant in the woods throughout the district, but especially on the Rouge, and the numerous covies met with afforded our party many a hearty meal. In May their crops were stuffed with the heads of *Trillium*, *Ferns*, &c., and large, spotted Slugs (*Tebennophorus caroliniensis*). In July they feed on the berries of the Fly Honey suckle (*Lonicera ciliata*), Dwarf Raspberry, (*Rubus triflorus*), Clintonia (*C. borealis*) &c. In August on the fruits of the Blackberry (*Rubus villosus*), and creeping Snow-berry (*Chiogenes hispidula*), with which their crops were literally crammed, and also on a Lepidopterous larva which feeds in great numbers on the soft maple (*Acer rubrum*). ; The males were heard drumming till the end of June. The young were half-grown about the middle of July,and remained in covies till the end of August, about which time they are full grown, and begin to separate. With the aid of a dog these birds are very readily obtained, for as soon as the dog begins to bark they fly up into the trees and are there easily shot, as they remain quite still, apparently trusting for concealment to their colour which so nearly resembles in tint the bark of a tree. I frequently saw them strutting about amongst the bushes within a few yards of me, and they will occasionally remain in a tree for a second shot if missed at the first discharge. Young birds often have worms several inches long amongst the intestines,

59. *Fulica Americana*, Gmel. (American Coot).—A pair seen September 14th in a small lake near the Lake of Three Mountains.

60. *Totanus macularius*, Wils. (Spotted Sandpiper).—Several pairs were seen on Sixteen Island Lake in May. It was very common the whole way up the Rouge to Hamilton's Farm, and was frequently observed in the numerous small lakes of the district. The last was seen on the 10th October.

61. *T. solitarius*, Wils. (Solitary Sandpiper).—First seen on the Rouge August 12th, when a pair were shot. Several were observed up to 13th September.

62. *T. vociferus*, Wils. (Tell-tale Tatler).—A solitary specimen seen on Trembling Lake, September 11th.

63. *Microptera Americana*, Aud. (Wood cock).—Said to have been heard in the swamps about Hamilton's Farm September 2nd, but none were seen.

64. *Ardea nycticorax*, Linn. (Night Heron).—A pair seen flying over head when camped near Gate Lake May 17th.

65. *A. lentiginosa*, Swains. (Bittern, "Indian Hen.")—An *Ardea*, supposed to be this species, was frequently seen at Bevin's Lake in July.

66. *Anas obscura*, Gmel. (Black Duck).—Frequently seen on Sixteen Island Lake at the end of May, and a nest was found there at the beginning of June containing ten eggs. A female with a large brood was seen on Bevin's Lake June 25th, and numerous other broods were met with up the Rouge, and in the small lakes on either side in July, at the end of which month many of the young birds could fly strongly. Whenever we gave chase to a Black Duck and her young, the latter would separate in all directions and dive as soon as the canoe came too close, but the old bird flapped along the water as though unable to rise, until the little ducks had concealed themselves in the bushes along the shore, then she would get up, and fly back over our heads. We found the half grown "flappers" which were shot, very delicate eating.

67. *A. sponsa*, Linn. (Bush Duck).—One seen on Bevin's Lake October 16th.

68. *A. discors*, Linn. (Blue-winged Teal).—One observed on Trembling Lake September 11th.

69. *Fuligula marila*, Linn. (Scaup Duck).—I saw some Ducks which resembled this species on Sixteen Island Lake May 20th.

70. *F. clangula*, Linn. (Golden-eyed Duck).—Frequently seen on Sixteen Island Lake in May. A young one nearly full grown, was shot on the Devil's River July 20th.

71. *Mergus serrator*, Linn. (Red-breasted Merganser).—Often observed on the Lakes in Wentworth and Montcalm in May and June. A young bird was shot on the Rouge, August 5th. They became very numerous on the Rouge and in all the lakes about the first week in September, and continued so till the middle of October. Many were shot and eaten but were very fishy in flavor. When at Trembling Lake on 10th September, several immature individuals of this species alighted on the water within ten yards of our canoe.

72. *Mergus cucullatus*, Linn. (Hooded Merganser).—An immature merganser resembling the young of this species was shot on the Lake of Three Mountains September 23rd, and another was seen two day's after.

73. *Larus argentatus*, Brunnich. (Herring Gull).—A large Gull, supposed to be this species, was frequently seen at the end of May on Sixteen Island Lake.

74. *Colymbus glacialis*, Linn. (Great Northern Diver, "Loon"). This fine bird was seen in almost every lake visited by us, even including the remarkable one about a quarter of a mile long, on the top of "Silver Mountain" on the Rouge, about five miles above the "Huckleberry Rapids," Lot 40th., Range 2nd., De Salaberry. It is never seen in the Rouge, though so numerous in the lakes. All observed were very shy and rarely approached within shot. They are however frequently killed by the Indians who make handsome tobacco pouches and purses from the skin of the neck of the male. One immature specimen nearly as large as an old bird was shot October 5th.

75. *Podiceps Carolinensis?* Lath. (Pied-billed Dobchick, or Grebe).—A Grebe which I took to be this species, was observed by me on Chain Lake, Montcalm, June 14th.

The Rice-Bunting, or "Bob-o-link" (*Dolichonyx orizivora*), and the Red-headed Woodpecker (*Picus erythrocephalus*) were observed about Point Fortune, opposite Carillon on the Ottawa, but were not met with in the woods.

REPTILIA.

It is not improbable that the following list includes nearly all the Reptiles which occur in the district.

1. *Chelydra serpentina*, Schw. *Emysaurus serpentina*, Linn. (Snapping Turtle or Tortoise).—In October I was given a shell of this species by G. W. Allbright, Esq., P.L.S., who obtained it during the past summer up the Devil's River, a tributary of the Rouge, having its origin in Trembling Lake, and running through the Townships of Grandison and De Salaberry. The carapace measures a foot in length, and nine inches in breadth, and shows the mark of a burning brand applied to the shell to make the poor animal put out its head. I was not fortunate enough to see any living specimens, but Turtles are reported to be frequently met with in the lakes of the district, and to reach a large size.

2. *Glyptemys insculpta*, Agassiz. *Emys insculpta*, Le Conte. (Sculptured Tortoise).—When camped near Mr. Thompson's house in the 15th Lot, 3rd Range, Arundel, I was shown the shell of a specimen obtained on a small sandy island in the Rouge opposite the clearing, where they are said to be not uncommon, and I was informed that sixty-eight eggs, of which I saw one, were found in

the sand there. I also obtained a fragment of a shell of this species at the mouth of the Devil's River.

3. *Eutainia sirtalis*, Baird & Girard. *Tropidonotus sirtalis*, Holbrook. (Garter or Striped Snake).—We met with no snakes till we reached the chute on the Rouge called "Huckle-berry Rapids," and sometimes "Black-lead Falls," from the quantity of Graphite in the Crystalline Limestone there, in the 30th Lot 2nd Range De Salaberry. Here this species was quite numerous amongst the Limestone rocks in open places, at the end of July and beginning of August, and at Hamilton's Farm August 31st, I saw one plunging about in the river, having apparently accidentally fallen in from off the steep bank, but it reached the shore and escaped amongst the herbage before I could secure it. In my way down to Grenville on 12th October, I saw great numbers lying crushed on the road through the Townships of Harrington and Grenville. No other Ophidian Reptile was seen, but reports of a "Water Snake," said to inhabit the lakes, came to my knowledge.

4. *Rana Catesbiana*, Shaw, *pipiens*, Holbrook. (Bull Frog).—Abounds in every lake and pond throughout the district, and the curious tadpoles of this species were to be seen during the whole season.

5. *R. nigricans*, Agassiz. (see Agassiz, "Lake Superior" p. 879).—Abundant at Sixteen Island, Chain, and Sugar-bush Lakes, Montcalm, at the end of May and June.

6. *R. pipiens*, Gmel., *halecina*, Holbrook et aliorum. (Leopard Frog) Abundant in Sugar-bush Lake, Montcalm, in June.

7. *Hyla versicolor*? Le Conte. (Tree Frog).—"Tree Frogs" probably of this species were said to have been heard about Sixteen Island Lake at the end of May. None were obtained.

8. *Bufo Americana*, Le Conte (American Toad).—Common throughout the district. When camped at the Indian Village on the Rouge, Lot 16, Range 7, Arundel, it was most extraordinary to watch the toads assembling at night round our fire, attracted by its light, and after staring at it with astonishment for a few minutes, suddenly jump into it and quickly scramble out again half roasted. On 31st July at "Huckleberry Rapids," vast numbers of little toads were hopping about in the bed of a small creek there.

9. *Plethodon erythronota*, Green. (Red-backed Salamander).—Abundant under the bark of dead logs &c., in the Townships of Wentworth and Montcalm in May.

10. *Spelerpes bilineata*, Green. (Two-lined Salamander).—Common under dead logs, &c., in moist places, in the Township of Montcalm at the end of May and June.

11. *Triton ?* (undetermined).—One specimen taken in Sixteen Island Lake June 2nd.

A "Lizard" was reported as inhabiting a small stream crossing the portage between Gut and Gate Lakes, Wentworth, but I failed to obtain specimens when I sought for it.

PISCES.

Owing to the extreme difficulty of transporting alcoholic specimens across the portages, I collected but a limited number of fish, and there are doubtless a great number of species, besides those enumerated, to be found in the innumerable lakes of the district. The Fauna of these lakes, from various causes, frequently varies very much, and a careful comparison of the fish inhabiting each, would furnish a most interesting field of enquiry, and would doubtless tend to throw much light on Geographical Distribution and the Variation of Species. This, however, could only be accomplished by a person having abundance of time at his command, and well furnished with the means of obtaining and transporting specimens. Another great obstacle in carrying out such an examination, would be the total absence in this country of any collection worth mentioning of North American Fish, with which the specimens collected could be compared, and the want of some good and complete work on the subject. These difficulties I have myself severely felt in prosecuting my researches for the present paper, and in determining the few specimens which I brought home I received much assistance from Prof. Dawson, the Principal of McGill College, to whom I am also indebted for the loan of various works on North American Zoology.

1. *Pimelodus cœnosus*, Richardson. (Cat-fish, "Barbeau").—Very abundant in a small lake, 11th Lot, 3rd Range, and Sugar-bush, Bevin's and Bark Lakes, Montcalm. All these lakes have muddy or sandy bottoms with sloping shores in most parts, and communicate without much fall with the Rouge. During the day-time this fish remains at the bottom slowly moving about, but in the evening rises at flies on the surface of the water. At dusk they may be caught with pork as a bait, and are also easily speared by torch-light. They are very tenacious of life, and I have known them live a whole night out of water, an interesting

fact connected with the reptilian character of the class of fish to which the genus belongs. Before being cooked they are thrown into the hot ashes of the fire for a few seconds, until the slimy skin peels off, after which they are fried with pork-grease and taste much like eels. When bathing in Sugar-bush Lake great numbers of small chub crowded round me, and a Cat-fish of some size nibbled at my leg.

2. *Perca flavescens*, Cuvier. (Yellow Perch).—This fish was numerous in the same lakes as the Cat-fish, and also in a lake about three miles east of Hamilton's Farm, communicating with the Devil's River. It did not reach any size nor did it take a bait very freely. In these beautiful lakes, with their clear water, it is most interesting to watch the habits of the various small fish congregatiug round the shores, amongst which the perch is conspicuous from its striped sides.

2. *Esox boreus*? Agassiz. (Pike). The specimen which I preserved was caught in the small lake previously mentioned in the 11th Lot, 3rd Range, Montcalm, and agrees very well with the destription of *E. Boreus* in Agassiz's "Lake Superior" p. 317, with the exception that the lateral line is very indistinct instead of being "very distinct." It does not agree with *E. lucius* as described by Yarrel, though it does in most particulars with the description of that species given by Richardson in "Fauna Boreali Americana." It had a small leech-like parasite adhering to its side. The average weight of those we caught was two pounds, and the length eighteen inches. The largest taken in Bevin's Lake, measured twenty-four inches in length, eight and a half inches round the body over the pectoral fins, and weighed four pounds. The mouth is very tender and tears very much when hooked, but they will bite freely even though struck and lost several times. They frequently jump over the bait if it is pulled too rapidly through the water. We used as bait fat-pork, squirrel, *leucisci*, pieces of trout, frogs, and the animals of *Anodonta*, all of which they took readily, often biting at Chub (*Leucisci*) even ten inches long. Before a thunder storm they rushed up to the bait, but would not bite at it. We also captured them in gill-nets made of pack-thread and set at night with stakes. They would bite through the fine gimp of our tackle if it got between their teeth and frequently escaped in that manner. It was amusing to see the shoals of small fish throw themselves desperately out of the water when one of these voracious pikes rushed amongst them. Pike were nume-

rous in the same lakes as the Cat-fish and Perch, and all the way up the Rouge as far as we ascended.

The three above species were almost always found together and there were never any trout in the lakes which they inhabited.

4. *Salmo fontinalis*, Mitchill. (Brook or Spotted Trout).—Abounds in nearly all the lakes and brooks through the district. One specimen only was taken in the River Rouge itself, and it is not found in those lakes in which the Cat-fish, Perch and Pike occur, nor in their outlets, though frequently abundant in the small streams flowing into them. In May, at Sixteen Island Lake, we found the best time to fish for trout was after sunset, when they approached the shores to feed in the shallow water. Those taken in this lake varied very much in color and markings, some specimens being entirely dark silvery lead-color with a few very small scarlet spots about the lateral line, whilst others were light yellowish brown, with large and numerous scarlet spots. Many were marked with large irregular black patches on the back and sides giving them a very peculiar appearance. They were much less brilliant in their tints here than in the small lakes and streams we afterwards visited. The largest specimen of the lead-colored variety, which was very numerous, measured fifteen and a half inches in length, and seven inches round the body behind the pectoral fins. The young fry banded with black and about an inch long, were very numerous May 19th, in a small stream running into the lake. After leaving Sixteen Island Lake in June, we found all the small lakes and streams between Balsam or Chain Lake and the one in the 11th Lot 3rd Range Montcalm, swarming with trout, which lay in shoals in the pools of the streams, and in the shallows at their entrance into the lakes, watching for any prey which the water might bring down. In such places the water was so clear, it was necessary to take great care in concealing oneself, as the least movement caused all the fish to dart away, and they would only bite when a puff of wind ruffled the surface of the water. In the cold deep lakes they took the bait very quietly and gently, and it was often difficult to tell when we had a bite, for as there was no current they could examine any object which looked tempting at their leisure, but in the rapid streams, foaming and tumbling over rocks and prostrate trees, they left their concealment beneath some projecting rock or fallen log at the moment the bait touched the water, and dashed at it with so much violence that they were frequently hooked in the body by rushing over it. They were

quite as voracious as the pike, and on one occasion I landed a small trout which had a "chub" sticking half out of its mouth having been too large for its captor to swallow entirely. In general the pool below each little fall on a brook was inhabited by a single trout, which in such places rarely exceeded six or seven inches in length and was usually much smaller. In summer when the small creeks running into the Rouge were almost dried up, it was wonderful how the trout, even of considerable size, contrived to conceal themselves, when disturbed, behind every little stick or stone in the water. Those we caught on the 8th September in a stream flowing into Trembling Lake were full of spawn of the size of duck shot, but the larger ones in the lake itself would not bite, on the 10th however, they began to bite again in the Lake of Three Mountains, and during the remainder of the month and first week of October we captured great numbers of fine trout in that lake and the numerous others connected with it. They lay in shoals amongst the *Equiseti* which grow thickly at the mouths of the creeks running from one lake to another. At this season of the year when the Mosquitoes, Black and Sand-flies have ceased to be troublesome, and the hills clothed with trees, in their autumnal hues, vie in richness of coloring with the splendid trout themselves lying struggling and gasping at the bottom of the canoe, nothing can be more delightful than a day's fishing in one of these retired lakes, whose calm and tranquil surface is undisturbed by anything save the dimples caused by the rising of the lazy fish, by the flocks of Mergansers as they hurriedly rise at our approach, or by the white breasts of the loons popping up here and there after a long sustained dive. Nothing however, could be less artistic than our mode of catching these beautiful fish, now at their prime, fat and full of strength from their summer's feast on the flies, and biting in a very different manner from those taken in spring when they are weak and languid after their long winter's fast. Our implements consisted of a fir pole, a few yards of whip-cord and a mackarel hook, with a lump of fat pork or a piece of a squirrel for a bait. We usually fished from a canoe, as the trees everywhere growing down to the water's edge rendered it impossible to throw our lines without entangling them in their branches, and it is somewhat nervous work when three persons fish from a small bark canoe, and the trout kicking and plunging on the lines causes the frail craft to roll from side to side in anything but an agreeable manner. Their coloring varied very much, some were like those

of Sixteen Island Lake, silvery lead-color with small red spots, others very light salmon-color, a little darker on the back, with the scarlet spots very distinct, whilst others again were pale olive brown with salmon-colored bellies. One beautiful specimen was very deep salmon-color on the belly, pale silvery blue on the sides, with large and brilliant scarlet spots, and the back almost black spotted with yellow, the tail purplish with a submarginal band of lake and margined with white. The ventral and pectoral fins of all were salmon-colored with a broad streak of white on the outer margin. The males were generally much brighter that the females, and were of a brilliant orange color on the belly instead of pale salmon-color; the cartilaginous projection on the lower jaw was much grown over the mouth as is usual in the breeding season. The females, which were at least two to one of the males, were full of spawn. The average size of the trout in these lakes was from twelve to twenty inches in length, and from six and a half to nine and a half inches in girth, the heaviest weighing about four pounds.

5. *Salmo*? (Grey Lake Trout).—This species, which I have been unable to determine, was first met with in May at Sixteen Island Lake where we caught several fine specimens of four or five pounds in weight, measuring twenty-three inches in length and ten inches in girth behind the pectoral fins. At that time they took our bait in a very sluggish manner and afforded no sport whatever, giving merely a dead pull when hooked. The flesh is pale buffish white and is not nearly so rich in flavor as that of the last species, which is deep salmon-color. They begin to bite much later in the autumn than the Spotted Trout or about the middle of October, and were not so abundant as that species, being found only in the larger Lakes, viz. Sixteen Island, Trembling and Three Mountain Lakes.

6. *Coregonus*? (White-fish).—When at Bevin's Lake on 15th October I saw several specimens of a *Coregonus* which had been just taken with a net in that Lake. As I was unable to preserve specimens I cannot determine the species. There were none in the Lake when we were camped there in June and July, at least we took none in our net.

7. *Catastomus*. Two species of "Sucker" were said to have been taken in Sixteen Island Lake whilst I was absent, and were spoken of as the "Mullet" and "Black Sucker." One was also caught in Bevin's Lake in June, but unfortunately I did not see any specimens myself.

8. *Leuciscus?* A large fish, known as "the Carp," usually about seventeen inches in length, and about two pounds in weight, was abundant in all the lakes, and in the Rouge and Devil's River, readily taking pork, smaller *leu isci* or any kind of flesh. On the sides the scales have a beautiful bronze or golden lustre, and the basal half and margin of each is black. The fin rays are as follows: Br. 3. D. 9. C. 20. V. 8. P. 16. The anterior ray of the pectorals is very strong and thick. In many specimens the snout was armed with numerous small turbercles, but others were entirely destitute of them or possessed them in a rudimentary state only. On the 5th August I saw many heaps of small stones in shallow parts of the Rouge, said to be piled up by this fish to cover its spawn. They bite best about the middle of the day, and we found them good eating, at least when we could obtain no trout. This species may be *Cyprinus corporalis*, Mitchill, but does not agree satisfactorily with any fish I have seen described.

9. *Leuciscus pulchellus*, Storer. (Chub).—This was the most abundant fish in all the lakes and rivers throughout the district. Its usual length being between eight and ten inches. My specimens agree very well with *L. pulchellus* as described by Thompson in his "Natural History of Vermont," but there is considerable discrepancy between his description and that given by De Kay in his volume of the New York Fauna.

10. *Leuciscus frontalis*, Agassiz. Abundant in streams flowing into the small lake 11th Lot, 3rd Range, Montcalm. The specimens collected agree exactly with the figure and description of this species in Agassiz's "Lake Superior," with the exception that instead of *fourteen* they have *sixteen* rays in their pectoral fins.

11. *Leuciscus?* A small species with three bony tubercles on each side of the head in a line over the eye, was common in the same stream with the last. I cannot find it described though evidently a very distinct species.

All the Lakes swarmed with the young of various *Leucisci* which are called "Dace" and "Chub." Several species besides those above mentioned were met with in Trembling and Three Mountain Lakes, but as I had then no means of preserving specimens I cannot determine the species.

One small *Leuciscus* which I took in Chain Lake, Montcalm, had the abdomen immensely distended, and on opening it I found the whole cavity occupied by an intestinal worm. The fish itself was but two and a quarter inches in length, and the worm when

extended was fully three and a half inches long, and two lines in breadth. It was very flat with a deep groove down the middle and transversely striated. The intestines, &c., were very small and the worm was closely knotted and twisted together and intermingled with them.

(To be continued.)

ARTICLE XX.—*Contributions to Meteorology: from observations taken at St. Martin, Isle Jesus, Canada East.* By CHARLES SMALLWOOD, M.D., LL.D, Professor of Meteorology in the University of McGill College, Montreal.*

The following observations extend over the year 1858: The Geographical co-ordinaries of the Observatory are Latitude 45°32′, North, and Longitude 73°36′, West, from Greenwich. The cistern of the Barometer is 118 feet above the leved of the Sea, the Mean results are obtained from tri-daily observations taken at 6 a.m., 2 p.m., and 10 p.m., and the whole of the observations have been subjected to the usual corrections, depending on the constructions of the instruments and for temperature.

Barometic Pressure.—The highest reading of the Barometer during the year, was at 10 p.m., on the 22nd of January, and indicated 30.697 inches. The lowest reading for the same period occured at 2 p.m., on the 21st of March, and was 29 021 inches, giving a yearly range of 1.676 inches. The greatest monthly range was in January, and this holds good for a series of years, with the exception of last year, 1857, when December indicated the greatest monthly range. June of the present year indicated the lowest monthly range, 0.660 inches, although July for a series of years has indicated the least monthly range. This year July exceeded by 0.014 the lowest range of June. The mean barometic pressure for the year was 29.829, which exceeds by 0.071 inches the mean of last year, and shows an increase in pressure of the atmosphere compared with a series of years. The mean height of the barometer for the month of January was 29.907 inches; for February, 29,809; for March, 29.804; for April, 29.757; for May, 29.751 inches; for June, 29.771 inches; for July, 29.759 inches; for August, 29.789 inches; for September, 29.830 inches; for October, 29.982 inches; for November, 29.779 inches; for December, 30.015 inches. The mean monthly range of the baro-

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* From the Canadian Journal for July, 1859.

meter for the month of January was 1.627 inches; for February, 1.129 inches; for March, 1.340 inches; for April, 0.947 inches; for May, 1.039 inches for June, 0.660 inches; for July, 0.674 inches; for August, 0.714 inches; for September, 1.221 inches; for October, 1.032 inches; for November, 0.856 inches; and for December, 1.241 inches.

The greatest range within twenty-four hours, with a rising column, occurred on the 21st January, and was 0.730 inches; and the greatest range, with a falling column, was on the 10th of January, and indicated 0.903 inches. The most sudden variation, with a rising column, occured on the 18th of June, and from 3 p.m. to 3.20 p.m. (*Twenty minutes*) indicated a rise of 0.075 inches. The *Symmetrical wave of November* exhibited but little fluctuation, the final trough terminated at 6 a.m. on the 30th day.

Temperature of the Atmosphere.—The mean temperature for the year was 40°.04 Fahrenheit, which shows a decrease in temperature of 0°.53 compared with the temperature of 1857, and indicates 1°.520 less than the mean temperature for a series of years. The lowest observed temperature was on the 13th of February, and indicated 30°.2 below zero. The highest temperature occured on the 7th of July, and was 99°.3. giving a yearly range or climatic difference of 129°8. *February* was the coldest *February* on record here, and indicated 14°05 colder than the mean of last February, 1857. The highest degree of temperature for the month was 39°.4, and the lowest 30°.2 below zero. The most sudden decrease of temperature occurred on the 18th of June, and indicated in twenty minutes a decrease of 17°.1; the thermometer standing at 3 p.m. at 93°8, and at 3.20 p.m. 76°.7 The mean temperature of the air for the month of January was 13°.76; for February, 7°.56; for March, 23°52; for April, 39°.06; for May, 63°.02; for June, 67°.21; for July, 66°.50; for August, 66°.12; for September, 59°.13; for October, 46°48; for November, 26°78; and for December, 12°.37. July which has for a series of years indicated the greatest *mean* temperature showed this year 0°.71 less than the *mean* temperature of June. This was owing to the low temperature accompanying the excessive rain of the month of July.

Humidity.—The relative mean humidity of the atmosphere for the year (saturation being 1,000) was 0.778. July indicated 0.074 of moisture more than the *mean* of a series of years. The mean humidity for the month of January was .786; for February,

.703; for March, 789; for April, .717; for May, .764; for June, .756; for July, .818; for August, .818; for September, .804; for October, .792; for November, .809; and for December, .787. Complete saturation occurred in July, and is the only instance on record here of such an occurrence.

Rain fell on 111 days, amounting to 50,035 inches on the surface. It was raining 521 hours, 33 minutes, and was accompanied by thunder and lightning on 20 days. This amount of rain exceeds by upwards of 7 inches the usual average amount compared with a series of years, and was owing to excessive rains in June and July.

A very heavy storm of rain occurred on the 10th of June, which lasted 28 hours and 48 minutes, and amounted to 6.175 inches. There fell in one hour (from 5 to 6 p.m.) 0.933 inches, and from 6 p.m. to 7.28 p.m. the amount of 1.333 inches. The river surrounding this Island rose 8 inches in height.

Another storm of heavy rain set in at 3 a.m. on the 12th day of July, and ceased at 12.40 p.m. of the 13th, and indicated a depth of rain on the surface of 6.374 inches; it was acompanied by a N.E. by E. wind. The river in the neighbourhood rose nearly 2 feet in perpendicular height, and the amount of rain which fell during this month was 12.214 inches, and is the most rainy *July* on record. The amount of rain which fell in the month of August was less than the usual mean quantity for that month.

Snow fell on 46 days, amounting to 58.96 inches in depth; it was snowing 281 hours, 30 minutes; this amount shows a decrease equal to 36.80 inches compared with the mean amount of a series of years. February and December were the months which showed the greatest amount of snow. The first snow of the season fell on the 4th of November, and the last snow of spring fell on the 21st April.

Evaporation.—The amount of evaporation from the surface of water, during the seven months which the observations are recorded (owing to the presence of frost) amounted to 18.730 inches, which is 1.515 inches less than the usual amount of last year. July indicated about 1 inch less than the usual amount; the amount of ice evaporated during the remaining months of the winter season showed about the usual average amount.

Wind.—The most prevalent wind during the year was the N.-E. by E. The next in frequency the W. by N., and the least

prevalent the S. The aggregate amount linear in miles run was 41,338.60 miles, which shows a decrease of 13,086.50 miles compared with last year, and a decrease of 11,723 03 miles compared with 1856., The yearly mean velocity was 4.613 miles per hour, which is 1.567 miles less than the mean annual velocity for 1857, The maximum velocity was 37.70 miles per hour. January was the most windy month, and September the calmest.

The greatest *Intensity of the Sun's Rays* was 117°, and the lowest point of *terrestrial radiation*, 31°.2 below zero.

The yearly amount of *Dew* was considerably below the usual mean amount compared with a series of years.

There were 56 days perfectly cloudless, which is 25 more than the cloudless days of 1857. There were 118 nights suitable for astronomical purposes.

The Aurora Borealis was visible at observation hours on 39 nights. *Lunar Haloes* were seen on 4 nights. The *Zodiacal Light* was very bright in February, but since then has exhibited no special appearance. *Parhelia* were visible on 2 days.

The Eclipse of the Moon was *visible* on the 27th February. The Eclipse of the Sun was *invisible* on the 15th March owing to cloudy weather.

The winter of 1857-58 fairly set in on the 22nd December 1857.

Ozone.—The amount of ozone during the year has shown an increase on the usual average. Observations are now being taken here, intended to shows the effects of the different coloured rays of light on the Ozonecometer, and also the effects of vegetation on the amount.

Atmospheric Electricity.—The tri-daily observations are still continued in this important branch of science, the amount indicated in frequency and tension is very near equal to the amount of last year, but is nevertheless rather below the usual average. The *Romershausen* apparatus seems pretty well adapted for the purpose of collecting atmospheric electricity, bnt is inferior to the large apparatus which is erected here, both as to collecting and retaining the electric charge.

The Song Sparrow (*Fringilla Melodia*) the harbinger of spring, first heard on the 10th March. Swallows (*Hirundo Rufa*) first seen the 15th April. Frogs (*Rana*) first heard the 15th April (this is about a week earlier than usual,) Shad (*Alosa*) first caught 29th May. Fire-flies (*Lampyris Corusca*) first seen the 18th of

June. Snow Birds (*Plectrophanes Nivalis*) first seen 26th October. Crows did not winter here this year. Wild Strawberries in flower 27th May, and matured 26th June. Gooseberry in leaf 9th May. Currant tree in leaf 21st May. Plum tree in blossom 26th May. Apple tree in leaf 3rd June.

The potatoe rot, which manifested itself but partially this year, commenced in this neighbourhood on the night of the 7th August.

St. Martin, Isle Jesus, 21st March, 1859.

ARTICLE XXI.—*The Oxford Museum.* By H. W. Acland, M.D. and John Ruskin, M.A. (Smith Elder & Co.)

[*From the Athenæum.*]

The University of Oxford has distinguished itself by a bold educational movement. Partly by external pressure, partly by internal pressure, partly by internal sympathetic force, "it has greatly advanced those pillars in the learned world which seemed immovable." In spite of the forebodings of many excellent persons who have a nervous dread of the unknown, the restorative effect of geology, chemistry, natural science, and languages less ancient than Greek and Latin, is beginning to be tried upon the constitution of the University. Oxford is changed for the better. The body for which Mr. Gladstone appears in Parliament is not that for which Sir Robert Inglis sat. The former gentleman does not represent the past so much as the present and the future. He is not the expression of Palæozoic Oxford—the Oxford of the insular self-existing period—but Oxford after the attrition of young and vigorous intellect—the Oxford of the later measures—demiurgic Oxford, within the compass of the telegraph and the railway, and distant only an hour and a half from the metropolis.

The time was in Oxford when to be conscious of German, or not to believe in the Ptolemaic system, was an offence against the Statues and against good manners. What undergraduate dared visit the libraries, though he was assessed for them, or ransack the MS. treasures of the Bodleian? Now and then an adventurous German lifted the veil of dust, and gained a brief sight of valuable long-buried Sanscrit or Syriac information. For what have not Germans dared? How have they not affrighted the *Dii majores* of primeval Oxford! *Nolo hanc universitatem Germanizari*, was the last famous denunciation of the old time—but like the last bard, that traditional Don has vanished. Few emblems of the

ancient time remain now in Oxford. The examinations have passed away or have other names. To be sure there are some old tests which are preserved, but only to denote the epoch—as the Trilobites indicate the Silurian era. There still are prison gratings to the College windows—strong bolts and locks to the ponderous College-gates,—the Vice-Chancellor is still environed by a procession of pokers,—still the porter keeps the gate, regardless of the signs of the times, "of foreign levy or domestic treason," intent only upon the hour of nine, the tolling of Great Tom and the periodicity of gate-fines. Otherwise, Oxford is changed. She no longer thinks fit to exert her right in suppressing an unimportant book or in raising a harmless Professor into an inconvenient notoriety,—she leaves heterodoxy to die a natural and obscure death, and addresses herself to her proper function of circulating positive and practical truth and becoming a central light to the towns of industrial England. We have noted with pleasure the gradual extinction of the ol town-and-gown feud,—the urbanity of the University in sallying forth as in earlier times from its walls,—and lastly, the proposal to convert the Radcliffe Library into a free library, where artizan readers shall be admitted by night—as in some good time coming we may hope to see them admitted within the walls of a National Library. The influx of a still more healthy element we have to record in the completion of a Museum for Science. This has long been felt a want in Oxford. A knowledge of words rather than of things was the great aim of the ancient time. Half of the pedantry of the place arose from the pride of classical lore and over-bookishness.

Ethics were better understood than Physics—Aristotle's 'Organon' than his 'Physica.' It does seem strange, as Dr. Acland well puts it, that "it has taken some centuries from the epoch of Roger Bacon, followed here by Boyle, Harvey, Linacre and Sydenham, besides nearly 200 years of unbroken publication of the Royal Society's Transactions, to persuade this great English University to engraft, as a substantive part of the education of her youth, any knowledge of the great material design of which the Supreme Master-Worker has made us a constituent part."

We have heard one university authority argue that the Ptolemaic system was more conducive to religion than the Copernican, and we learn that not long ago a Head of a college seriously alluded in a university sermon to the "mysterious convolutions of domestic furniture." That religion has nothing to fear, but everything to

hope and gain, from the increase of scientific light, is only beginning to be gradually understood at Oxford, as elsewhere. It is pleasant to observe, at the time when Cambridge is inviting Prof. Owen to deliver a lecture on Comparative Anatomy, so interesting a phenomenon as the completion of a Scientific Museum in Oxford. Its ultimate success, no doubt, will depend more upon the ability and energy of the Professors and its practical and liberal character than upon the beauty and symmetry of its stones. Yet the outward visible fact makes us hopeful of the inward spiritual grace. Taking into account the influence which such a Museum may have in training future clergymen in principles of sanitary science, and modernizing future legislators and country gentlemen, the importance of the fact cannot be over-estimated. Still more, if, as we hope, working men are to be admitted to the Lectures of the Museum :—for why should not Oxford offer advantages to all, like Edinburgh or Glasgow?—and what may we not hope from our highest University when we remember that a Watt, a Ferguson and a Livingstone have been produced from the Scotch school of science?

The Oxford Museum consists of Schools of Chemistry, Natural Philosophy and Anatomy,—and is provided with suitable appendages in the shape of Lecture-rooms, laboratories, a library and reading-rooms. The large sum of 30,000*l*, was voted by the University for the object; and after public competition, the Gothic design of Messrs. Dean & Woodward was chosen as being on the whole most suitable for the purposes of the foundation. The sum voted allowed no margin for ornament, and barely provided the shell of the building.—What was wanting, however, the munificence of many persons, illustrious from position or learning, has supplied. Her Majesty set a noble example by offering to give five of the statues with which it was proposed to adorn the corbel of the arcade. Mr. Ruskin gave 300*l*. for the decoration of the windows;—Dr. Acland, one of the earliest promoters of the building, followed by eminent scientific men, gave shafts or capitals—money for inscriptions or sculptures, as their taste inclined :—the under-graduates and bachelors gave statues;—and even Cambridge Professors forgot their ancient rivalry, and contributed what was wanted. Not the least pleasant feature is to note among the contributors the names of some of the workmen who have been allowed to carry out their own designs. Conspicuous as contributors and workmen are a family called O'Shea, who have beau-

tified the capitals with devices fresh and original. Thus, by a pleasant co-operation, the building has grown up a noble monument of skill and endeavour and social goodwill. We trust it may entirely fulfil the intention of its promoters. It does not yet fulfil all that we should like to see carried out in a great national building, nor reach the grandeur of a Pantheon or a Glyptothek, it expresses and embraces the modern element in its material. Sculptors, architects, workmen, University men have done their best with the sum they had at their command. The building is such a building as Goethe supplied in the Wanderjahre—a great quadrangle surrounded by an open arcade. Every part is significative, and it only differs from the Goethean conception in this, that it does not open on a flower-garden, but on an avenue of trees. Occupying the great quadrangular space in the centre is a museum, which is roofed with glass, and resting upon solid cast-iron columns lengthening out into aisles. Along the spandrils of these aisles twine and interwine in wrought ironwork, leaves with flower and fruit of chesnut or lime or symacore or walnut or palm, —and in the capitals, or nestling in the trefoils of the girders, leaves of elm, of briar, of water-lilly, passion-flower, ivy or holly. The open arcade which runs round the quadrangle is the fairest and most architectural part of the building. It consists of two storeys—from the upper one the roof springs, so that both are open to the court. "In each of the arcades are seven piers, forming eight openings, and carrying eight discharging castles, within which are two lesser arches, resting on the pier, and at their junction with each other is a shaft with a capital and base." Taking the upper and lower floor the court is surrounded by 125 shafts. The number of shafts on the western or entrance side being distinct from the eastern side, which is incomplete.

The geological structure of the British rocks is prettily illustrated by the pillars. The Professor of Geology will tell us what to see:

["In the arrangement of the many valuable and curious examples of polishable stones which the liberality of our friends has enabled us to bring together, we have always desired to employ so much of system as to make these ornamental parts of the fabric really and obviously useful as a part of the exhibition of natural objects. Regarding the rocks as of aqueous or igneous origin and of unequal geological dates, we wished to exhibit these relations in our building by giving to each group an appropriate place.

It was found, after great efforts, possible to accomplish this to a considerable extent, but not quite so perfectly as was hoped. The principal reason is, that we could not obtain certain marbles known more than one hundred and fifty years since, to complete our series of mesozoic limestone."]

"If now you will stand in the centre of the great court, and turn your eyes to the west, '*solis ad occasum*' you will see, in the lower range of the shafts, six fine examples of granite and its twin brother syenite. First, on the left, Aberdeen grey granite, surmounted by the sculptured capital of Alismaceous plants; next, Aberdeen red granite, crowned by the Butomaceæ; then the largely porphyritic grey granite of Lamorna, with a capital of the date palm. On the other side of the entrance, stands my special column of syenite from Charnwood Forest, with the cocoa-palm for its crown; then the beautiful mottled granite of Cruachan, elaborated for us by the Marquis of Breadalbane, the capital being Pontederaceæ; and finally, the red granite of Ross in Mull, the gift of the Duke of Argyll, whose capital is Liliaceous."

Shafts of red or grey or mottled granite occupy the west side; on the north, calcareous rocks, the green marbles of Galway, or the red and black limestones of Cork. Turning to the east, as is proper, we face igneous rocks:—Killerton lava rock crowned with thorny Zamia—Inverara porphyry, with a capital of pine or fir —St. Leven's porphyry and black serpentine, bearing on its head a tuft of yew. On the south, "English and Welsh marbles, mostly of carboniferous limestone, but including what are less commonly seen, the breccia of Mendip and the gypsum of Chellaston." The upper corridor follows the same order with ninety-six shafts, which still want capitals. North and east are the granites of Aberdeen, Criffel, and Cornwall—the serpentines of Galway; on the south, fronting the coeval rocks of Ireland, carboniferous Devonian limestones; while on the west are "Nottinghamshire, Derbyshire, and Somersetshire marbles—specimens of Permian limestones—in the centre granites of Jersey and Cornwall—flanked by columns of slate and shafts of lias, blue and white—marbles of Purbeck, Stamford, and Buckingham." It is on the capitals of these pillars, illustrating the Flora of England, that the workmen have been allowed to work out their own designs, and in the execution of which the O'Shea family have greatly distinguished themselves. Without entirely endorsing Mr. Ruskin's organization of labour—of "men mailed and weaponed *cap-à-pie*"

—"men inheriting the instincts of their craft through many generations—informed and refined,—then classed according to their proud capacities in ordered companies, in which every man shall know his part and take it calmly,"—the capital of flowers satisfies us that we have workmen who, if properly trained and judiciously praised, may emulate what was done at Roslin or at Melrose, where

> No herb nor floweret glistened there
> But was carved in the cloister arches as fair.

[Professor Philips continues:—"Thus as far as possible the representation of plants, varied here and there by animals geographically and naturally associated with them, will be placed with so much of system as to help the memory, and will be sculptured with so much attention to the natural habit as to satisfy the botanist as well as the artist, neither of whom can expect the most skilful human hand to express in rough stone by means of hard steel all the delicacy and grace with which, by finer materials and by finer processes, the Great Artificer moulds the lilies of the field and the leaves of the forest. I need not remind you, that with this view of the utility and meaning of the arrangement of oor subjects, the architects, who have been very zealous in their efforts to make the whole successful, have been always able to combine what is due to the building as a work of art; nor am I aware that their opinion and ours have been in the least degree difficult to reconcile. We must not forget the sculptors, who have worked with singular zeal and ability. Finally, this is not a haphazard collection of pretty stones crowned by pretty flowers, but a selection of marbles and sculptures intended to illustrate points of some interest and importance in science and art. Upon the whole, you will probably not regret to have given so much time and attention to this matter. All that is told me confirms my own opinion, that it was well worth while to make this trial to combine grace with utility, and that the result will not be disappointment to those who have given us money for our work, and, what is more precious, their full confidence that we should use it with liberality and prudence."]

A series of sculptured portraits gives the crown to the building. These have been worthily entrusted to Mr. Thomas Woolner and Mr. Munro, who have entered on the work with zeal, and, we regret to learn, with self-sacrifice. Great Verulam, starry Galileo, Newton, Leibnitz, and Oerstead, have fallen to the lot of Mr.

Woolner; while the statues of Aristotle, Hippocrates, Cuvier, Davy, Watt, are either unassigned, or apportioned to Mr. Munro. Statues are still wanted of Archimedes, Euclid, Pliny, Copernicus, Franklin, Herschel, Lagrange, Laplace,—of Black, Dalton, Stephenson,—of Bell, Harvey, Hunter, Jussieu, and Sydenham,—and what to ancient Oxford Dons must be a sad shock, a statue of Priestley.

Anatomy occupies the north,—that is, the coolest side. To the south, where there is most light, is a large and airy domicile for Chemistry, and an open area for experiments,—while on the south-west are spacious lecture-rooms, and on the ground-floor a laboratory, modelled from the Abbot's kitchen, at Glastonbury. Our description of the museum is complete when we have mentioned the curator's house,—a beautiful example of Gothic, occupying the eastern angle.

Thus the Museum is, as Prof. Phillips describes it,—not "a haphazard collection of pretty stones crowned by pretty flowers," but a building at once apt and expressive.

The little volume which has served as our text consists of a Lecture delivered by Dr. Acland—two letters by Mr. Ruskin—and a letter of Prof. Phillips, the Curator, each giving his opinion on the wants or aim of the building. Mr. Ruskin, who here appears as the advocate of the practical, praises the beauty of the windows, hints at the healthiness of physical studies, and the probable influence of science upon the industry of the age. The general barrenness of the facade, is with him a subject of complaint and the want of ornament on the windows. He dissuades from the use of color at present. Sculpture finds great favour:—

"As the building stands at present, there is a discouraging aspect of parsimony about it. One sees that the architect has done the utmost he could with the means at his disposal, and that just at the point of reaching what was right, he has been stopped for want of funds. This is visible in almost every stone of the edifice. It separates it with broad distinctiveness from all the other buildings in the University. It may be seen at once that our other institutions, and all our colleges—though some of them simply designed—are yet *richly* built, never pinchingly. Pieces of princely costliness, every here and there, mingle among the simplicities or severities of the student's life. What practical need, for instance, have we at Christ-church of the beautiful fan-vaulting under which we ascend to dine? We might have as easily

achieved the eminence of our banquets under a plain vault. What need have the readers in the Bodleian of the ribbed traceries which decorate its external walls? Yet which of these readers would not think that learning was insulted by their removal? And are there any of the students of Balliol devoid of gratitude for the kindly munificence of the man who gave them the beautiful sculptured brackets of their oriel window, when three massy projecting stones would have answered the purpose just as well? In these and all other regarded and pleasant portions of our colleges, we find always wealthy and worthy completion of all appointed features, which I believe is not without strong, though untraced effect, on the minds of the younger scholars, giving them respect for the branches of learning which these buildings are intended to honour, and increasing, in a certain degree, that sense of the value of delicacy and accuracy which is the first condition of advance in those branches of learning themselves. Your Museum, if you now bring it to hurried completion will convey an impression directly the reverse of this. It will have the look of a place, not where a revered system of instruction is established, but where an unadvised experiment is being disadvantageously attempted. It is yet in your power to avoid this, and to make the edifice as noble in aspect as in function. Whatever chance there may be of failure in interior work, rich ornamentation may be given, without any chance of failure, to just that portion of the exterior which will give pleasure to every passer-by, and express the meaning of the building best to the eyes of strangers. There is, I repeat, no chance of serious failure in this external decoration, because your architect has at his command the aid of men, such as worked with the architects of past times. Not only has the art of Gothic sculpture in part remained, though that of Gothic colour has been long lost, but the unselfish—and I regret to say, in part self-sacrficing—zeal of two first-rate sculptors, Mr. Munro and Mr. Woolner, which has already given you a series of noble statues, is still at your disposal to head and systematize the efforts of inferior workmen."

The co-operation of architect and sculptor is a great desideratum:—

"I believe that the elevation of all arts in England to their true dignity, depends principally on our recovering that unity of purpose in sculptors and architects, which characterized the designers of all great Christian buildings. Sculpture, separated from archi-

tecture, always degenerates into effeminacies and conceits; architecture, stripped of sculpture, is at best a convenient arrangement of dead walls; associated, they not only adorn, but reciprocally exalt each other, and give to all the arts of the country in which they thus exist, a correspondent tone of majesty. But I would plead for the enrichment of this doorway by portrait sculpture, not so much even on any of these important grounds, as because it would be the first example in modern English architecture of the real value and right place of commemorative statues. We seem never to know at present where to put such statues. In the midst of the blighted trees of desolate squares, or at the crossing of confused streets, or balanced on the pinnacles of pillars, or riding across the tops of triumphal arches, or blocking up the aisles of cathedrals, in none of these positions, I think, does the portrait statue answer its purpose. It may be a question whether the erection of such statues is honorable to the erectors, but assuredly it is not honourable to the persons whom it pretends to commemorate; nor is it anywise matter of exultation to a man who has deserved well of his country, to reflect that his effigy may one day encumber a crossing, or disfigure a park gate. But there is no man of worth or heart, who would not feel it a high and priceless reward that his statue should be placed where it might remind the youth of England of what had been exemplary in his life, or useful in his labours, and might be regarded with no empty reverence, no fruitless pensiveness, but with the emulative, eager, unstinted passionateness of honour, which youth pays to the dead leaders of the cause it loves, or discoverers of the light by which it lives. To be buried under weight of marble, or with splendour of ceremonial, is still no more than burial; but to be remembered daily, with profitable tenderness, by the activest intelligences of the nation we have served, and to have power granted even to the shadows of the poor features, sunk into dust, still to warn, to animate, to command, as the father's brow rules and exalts the toil of his children. This is not burial, but immortality."

Mr. Ruskin thus sums up the design of the Gothic Revivalists. To make Art expressive rather than curious—fixed rather than portable—publicly beneficial rather than privately engrossed—to convey truthful information of form and promote intelligence among the workmen, has been attempted and carried out in the building. The University, we understand, has not been so parsimonious as Dr. Acland would have us believe, 60,000*l.*, and not 30,000*l.*, having been actually spent on this work. May it speed!

ARTICLE XXII.—*American Association for the Advancement of Science.*

This body held its annual meeting at Springfield, Mass., under the presidency of Dr. Alexander, during the week commencing August 3rd. There was a good attendance, and many interesting and important papers were read; the whole number registered being 108. On Tuesday the 9th, after having chosen Dr. Isaac Lea of Philadelphia to be president, and Dr. B. A. Gould, jr., of Boston, to be vice president for the next year, the association adjourned to meet at Newport, Rhode Island, on the 1st of August, 1860.

It is chiefly from the reports of the meeting published in the *Springfield Republican*, that we extract the following abstracts of several papers, which may prove interesting to our readers.

METEOROLOGY.

The first paper was by Professor Henry of the Smithsonian Institute, on Meteorology. He said that extensive operations had been made in Europe and in this country, by the British admiralty, the French government, the States of New York and Pennsylvania, and by the Smithsonian Institute. The Institute had purchased many hundred instruments which had been distributed over the country, but only a series of observations extending over many years could be of value. Prof. Coffin of Lafayette College had been especially employed by the Institution: he was abundantly qualified to execute the work. The labors performed had been immense, and an idea of what progress had been made would be given. There are 350 observers in the United States who make observations three times a day. To arrive at satisfactory results the observations must also be carried on at sea. This would be done eventually, especially if the public should demand it. It was a science which required time. It was impossible, he said, to make any advance in science if it had no hypothesis. We could collect facts, but to use them we must have a place. In studying nature, we soon learn to reject what is not true and preserve what is true.

He proceeded to give some general views of meteorology. The general idea of the motion of the atmosphere was from Hadley. The moving power in meteoric changes was the sun. It was originally supposed that the currents of air flowed from the equator to the

poles, but that could not be true; on account of the convergence of the meridians, there was not room for the air at the poles. There were middle systems, of intermediate currents of air. But these points were not fully established. There were exceptions in the general action which could be determined in their general bearings only by long observation.

One cause of the fitful disturbances of the atmosphere was the conversion of water into vapor. During a single shower an amount of water fell upon the Smithsonian Institute building equal to 20,000 horse-power an hour; that is to say the heat necessary to evaporate it would be equal to that required for working an engine of twenty thousand horse-power one hour. Another cause of disturbance was the motion of the earth itself upon its axis. In illustration, diagrams were given showing that the currents of air moved in circles,—that the same quantity of air that moved north must come from the north, of course not in the same track. Observations made tended to show a series of currents completely around the earth, north and south of the equator, also in the temperate latitudes, and in the Arctic circles. The calms at the equator, it was shown, was caused by the upward currents of the air,—currents coming from the north and south and rising over the equator, under the influence of heat.

In regard to the meteorology of our own continent, it was shown that there were four circles,—two in the Atlantic, one of which the Gulf Stream complete its circle once in three years, one in the Southern Atlantic, one in the Northern Pacific, and one in the Southern Pacific. These are sub-divided into minor currents. It is found that the cold Arctic current setting south from the coast of Labrador, passes through the Gulf of St. Lawrence, while the ice which comes down sets eastward towards Europe. Between these there is produced the deposition of vapor or fog on the banks of Newfoundland.

He had been assured by Mr. Wise, the æronaut, that out of 200 ascensions, he had always been enabled to move east on reaching an upper stratum of air. He (Prof. H.) therefore did not think it impossible that an aerial voyage could be made to Europe. Success would greatly depend upon the ability to make the balloon air-tight. If kept in the upper strata, it might succeed, although it was not certain there was not a reverse current in mid ocean. In the lower strata there were irregularities which must be avoided. The balloon he considered as an important means of

meteorological observation; by it, electrical phenomena and the formation of clouds could be observed. The reason why the English meteorologists had failed to make any satisfactory observations, was because they lived on the western side of a great continent, with no opportunity to make observations west of them, while we lived on the eastern side of a great continent, with telegraph lines extending inland thousands of miles. The formation of hail, thunder gusts, tornadoes, and other phenomena, were explained in a clear manner, which was listened to with intense interest and frequent applause.

He gave an account of the method of observation pursued each day at the Smithsonian Institute. They have a map of the United States hung upon a board, with pins stuck through it at the points where the observers of the institute are stationed. The Institute has daily reports by telegraph from many of these points. Each morning an assistant hangs a cord on the pins to indicate the state of the weather—black if raining, green if snowing, brown if cloudy, and white if fair. All storms travel east, and thus they are enabled to predict with great certainty the condition of the weather twelve hours in advance.

Meteorology as connected with agriculture, was then considered. It was shown that the fertility of the soil of the United States was owing to the currents from the Mexican Gulf and the Pacific; and it was shown that the climate of the 100th meridian must forever be unfruitful, unless trees should be planted, which might modify it somewhat.

CORRELATION OF PHYSICAL AND CHEMICAL FORCES.

Professor Joseph Le Conte, of South Carolina, read one of the ablest papers of the session on the above subject. The fact that matter is constantly changing its form, and is also indestructable, it universally admitted. Both these axioms hold good with regard to force. "The same absolute of force exists in the universe at all times and forever. The mutual convertibility of the various forms of force, is called the correlation of forces; and the unvariability of the absolute amount in the midst of changes shows the conservation of force."

There are four planes of material existence, which may be regarded as being raised one above another. The first and lowest is the plane of elementary existence, the second the plane of chemical compounds or mineral kingdom, the third the plane of vegetable

existence, and the fourth animal existence. Now it is apparently impossible for any known force in nature to raise matter through all these grades at once. On the contrary, there is a special force adapted for the elevation of matter from each plane to the one above. It is the special function of chemical affinity to raise matter from plane one to plane two. All the changes too which take place upon plane two by the mutual reaction of bodies situated upon that plane, are under the guidance and control of this force. It is the special prerogative of the force of vegetable life, to lift matter from two to three, or from the condition of mineral to the higher condition of vegetable matter. All the changes which take place upon this plane, the laws of which constitute vegetable physiology, are under the guidance of this force. Finally the force of animal life, and that alone, enjoys the privilege of lifting matter still higher into the fourth plane, i. e. the plane of animal existence. No force in nature can lift from one to three, or from two to four. Plants cannot feed entirely upon elementary matter, nor can animals feed upon mineral matter. The reason of this will be seen in the sequel. Thus it seems that after matter is raised from the elementary to the mineral condition, it requires an additional force of another and peculiar kind to raise it into the vegetable kingdom, and again another accession of force to raise it into the animal kingdom. Thus these kingdoms are truly represented as successive planes raised one above the other thus: 1, elements; 2, mineral kingdom; 3, vegetable kingdom; 4, animal kingdom.

In the same manner as matter may be arranged in several distinct and graduated kingdoms, it seems to me the forces of nature may be properly divided into distinct groups arranged in a similar manner one above the other. These are the physical, the chemical and the vital forces. And as in the case of matter, so in the case of force it is impossible to pass directly from the lowest to the highest group without passing through the intermediate group. The conversion of physical into vital force seems impossible without passing through the intermediate condition of chemical force

The argument of Mr. Le Conte went over wide ground and discussed the de- composition and re-formation of tissues and cells in plants—the atomic changes—the conservative forces, showing that vital is only transferred to physical force. In conclusion he asked; "If this is so, is it not possible that physical forces may generate

organisms *de nevo?* Do not the views presented above support the doctrines of equivocal generation and the original creation of species by physical force? I answer that the question of the origination of species is left exactly where it was found and where it must always remain, viz., utterly beyond the limits of human science. But although we can never hope by the light of science to know how organism originated, still all that we do know of the laws of the organic and inorganic world seems to negative the idea that physical or chemical forces acting upon inorganic matter can produce them. It is true that vital force is transformed to physical force, but the necessary medium of this transformation is an organized fabric; the necessary condition of the existence of vital force is therefore the previous existence of an organism. As the existence of physical forces cannot even be conceived without the previous existence of matter as its necessary substratum, so the existence of vital force, is inconceivable without the previous existence of an organized structure as its necessary substratum. In the words of Dr. Carpenter: 'It is the speciality of the material substratum thus furnishing the medium or instrument of the metamorphosis, which establishes and must ever maintain a well marked boundary line between physical and vital forces. Starting with the abstract notion of force as emanating at once from the divine will, we might say that this force operating through inorganic matter, manifests itself as electricity, magnetism, light heat, chemical affinity and mechanical motion; but that when directed through organized structures, it effects the operations of growth, development and chemico-vital transformations."

FORMATION OF OCEANS AND CONTINENTS.

Prof. LE CONTE then gave his views in respect to the formation of continents and oceans. It was an attempt to prove the truth of the theory of Prof. Airy as to the laws governing bodies floating upon fluids, and considered as explaining the phenomena of continents, oceans, and volcanoes, upon the supposition that the inside of the earth is fluid and enclosed by a crust. Prof. Le Conte gave an elaborate explanation illustrated by diagrams of different bodies floating upon water, proving that the under surface of such bodies may be judged of as to their configuration by a simple inspection of their upper surface. "If there is a general rising or depression of the upper surface from the margin towards the middle, we may be absolutely sure

there is a general projection or hollowing of the under surface corresponding; in a word, the general outline of the two surfaces is similar." If the surface of the earth is raised by continents, a corresponding thickness or elevation must be found inside, a swelling inward of the crust; and if the outer surface is depressed as in ocean bottoms, there the inner surface is hollowed out, making the middle of the bottom much thinner than the edges. The speaker from the evidence adduced to prove these general ideas, assumed that the centre of the earth was fluid, that the crust floats upon its surface and is subject to the laws of floating bodies. The laws and conditions under which this crust cooled and its state when solidified were then scientifically explained at length, as tending to confirm the generally accepted theories as to the fluidity of the central mass.

This theory, the speaker remarked, would satisfactorily account for the distribution of volcanoes, if not for the phenomena. He admitted that volcanoes were the most difficult of explanation of all the igneous phenomena in nature, and although gases and vapours are probably one cause of the eruptions, yet he thought few physical geologists would admit the local pressure of gas as the only or even the chief cause. The great general cause, he thought, might be the reaction of the crust upon the interior fluid, and gave his reasons therefor. At any rate the disruption of the crust should take place in the thinnest part as the bottom of the sea, and the next place should be the next weakest part or the margins of the sea, and these are exactly the places where the volcanoes occur. Of 225 active volcanoes mentioned by Humboldt, 155 are situated upon islands in the ocean, and of the remaining 70 almost the whole are situated near the sea-shore, while but very few are found in the interior of continents. This paper as a whole was remarkably clear, logical and conclusive, and presented many points worthy of study.

GYPSUM AND MAGNESIAN ROCKS.

Mr. T. Sterry Hunt, of Montreal, showed that besides those gypsums formed by the alteration of beds of limestone, another class, by far the more important, comprehends those gypsums which have been deposited directly from water. Such may be produced during the evaporation of sea-water; but Mr. H. has recently shown that sulphate of magnesia is decomposed by solution of bicarbonate of lime, giving rise to gypsum, which is first deposited, and a

more soluble bicarbonate of magnesia, which by further evaporation is separated as hydrous carbonate, either alone or mingled with carbonate of lime. When these magnesian precipitates are gently heated under pressure they are changed into magnesite or dolomite. Thus are explained the magnesian rocks associated with gypsums and with rock salt. The action of solutions of bicarbonate of soda may in like manner separate the lime from sea-water and give rise to solution of bicarbonate of magnesia; in this way are formed the magnesian limestones which are not associated with gypsum. The intervention in this process of the waters of alkaline metalliferous springs will explain the metalliferous character of many magnesian rocks. The source of the bicarbonate of soda has been the decomposition of feldspathic rocks to form clays and clay slates. The action of this alkaline carbonate upon the lime and magnesia salts of the primitive sea has been the source of limestone and dolomites, as well as of the sea salt which we find in the ocean, at the same time that the intervention of the carbonic acid of the atmosphere which has been through the medium of the soda, fixed in the form of carbonate of lime, has served to purify the air and fit it for the support of higher orders of plants and animals. In this relation between the atmosphere, the argillaceous rocks, the limestones and the salt of the sea, we have a remarkable illustration of the balance of chemical forces in inorganic nature.

FORMATION OF SILICIOUS ROCKS.

Mr. STERRY HUNT then spoke of sediments resulting from the disintegration and chemical decomposition of quartzose, feldspathic and pyroxenic rocks. In these the coarser portions consist of quartz and of feldspar containing potash, while the finer clays have less silica but more alumina, and besides alkalies lime, magnesia and iron, which are rare in the coarser sediments. These latter being more pervious to water, the small portions of soda, lime and magnesia still remaining are removed by lixiviation, while the clays retain these bases. When these different sediments are altered and crystallized we shall have on the one hand granitic or trachytic, and on the other pyroxenic rocks, the two great types recognized in igneous rocks, all of which Mr. regards as derived from the alteration and fusion of sedimentary strata. To the gases and vapors evolved by the fusion of deeply buried strata are to be referred the phenomena of earthquakes

and volcanos. The latter although dependent on the heat of the earth's nucleus, are not directly connected with the central fire.

LITHOLOGY OF VERMONT.

Mr. C. H. HITCHCOCK read a paper upon the so-called talcose schists of Vermont. The geological surveys of the various states have made known the existence of a broad belt of rocks from Canada to Georgia, consisting of green schists denominated talcose, associated with gneiss. This implies the presence of the mineral talc, which contains a large per cent of magnesia. He would not affirm the conclusion at which he had arrived applied to the whole belt, but that probably the character of the whole was the same—aluminous instead of magnesian. Mr. Sterry Hunt of Montreal had analyzed some of these rocks in their northern extension into Canada, and decided that there was no magnesia present, and that talc was replaced by pyrophyilite or pholerite, and had proposed to call them *nacreous schists*, instead of talcose. The rock was originally clay slate. Mr. Hitchcock offered several analyses of these rocks in Vermont, which were made for him by Mr. G. G. Barker of Boston, whence he concluded that there was no magnesia present, but that they were hydrous silicates of alumina with feldspar. One of the specimens from Pownal, Vt., was interesting as affording the composition of dsysintribite and of parophite, a mineral found in certain rocks in Canada by Mr. Hunt.

An analysis of a sandstone belonging to the Oneida conglomerate was also given, which went to show that some of the talcose schists were formed from sandstone probably of that age.

THE FLORA OF JAPAN AND NORTHEASTERN AMERICA.

Prof. ASA GRAY, gave a theoretical explanation of the identity or similarity existing between the flora of Japan and that of the northeastern part of North America. In the beginning, the speaker said that many plants supposed heretofore to be found only in the northeastern part of North Ameria had lately been found indigenous to Japan, and instanced the poison ivy, the fox grape, choke cherry, sweet cicely and ginseng as examples. Among shrubby plants our poison dog-wood has a prototype in the varnish tree of Japan. Closely allied species generally occur in the same, or contiguous localities, but here are identical species found on opposite sides of the globe, and the question naturally arises, what bearing

have these facts on the theories of the original distribution of species? Three different views have been advanced to explain the distribution of the same plants on the globe. The first supposes them to have originated in many different localities where they now are found. This is the view entertained by Prof. Agassiz, and on this theory these peculiar plants must have originated in two distinct and widely separated districts. The second theory refers the origin of each species, to one place, but allows some of them to have been reproduced in other localities as exceptions to the general law. The third refers each species to one place only as its starting point, though not from one pair, necessarily, unless it be in the case of the higher plants. This was the theory adopted by the speaker, although the facts already given as to the plants found in Japan, at first seemed opposed to such an idea. In explanation of those facts, he said the similarity of climate between Japan and New England would not be sufficient. The plants of western Europe are not like those of Oregon and California, though the climate is. The idea that the seeds have been carried naturally from one country to the other is not satisfactory. He supposed the flora of this country to be older than the fauna; and that it dates back probably to the post-tertiary period. The evidence of this last he based principally on the alleged fact that fossilized specimens of our present flora have been found, and referred to about the time of the drift period; and he then explained at some length his views as to the effect produced on the vegetation by the changes in temperature during the glacial period. Whatever dispute there might be as to this last matter, the fact would not be denied that our present flora appeared soon after that period. In the diluvial epoch the temperature in this latitude must have been much warmer than it now is; the temperate flora of the present day, then also in existence, must have extended much further north, perhaps nearly up to the Artic circle, and probably spread across from one continent to the other. Want of time prevented him from giving his views as to why he adopted the third theory of the origin and distribution of plants rather than the others; he simply wished to-day to give his views in explanation of facts seemingly opposed to it.

DEVONIAN AND CARBONIFEROUS FLORA OF BRITISH AMERICA.

Prof. Dawson of Montreal gave a summary of results which he had obtained from the study of the land plants preserved in

the Devonian rocks of Gaspé,—the Gaspé sandstones of Sir W. E. Logan's survey. The most remarkable of these remains is a Lycopodiaceous plant, for which he had instituted the new genus *Psilophyton;* it is so preserved in the Gaspé sandstones as to exhibit all its parts in a remarkably perfect manner. Many so-called Devonian fucoids are merely fragments of this plant. The Devonian flora of Canada also includes a conifer named by Prof. D. *Prototaxites Logani*, a *Lepidodendron*, *Nœggerathia*, and *Knorria*, with some other plants not determined. In the collection of Dr. Jackson of Boston, and at Portland, Prof. D., had seen specimens indicating that a similiar flora exists in rocks probably Devonian at Perry, Maine.

The remainder of the paper was occupied with the results of an extensive series of Microscopic observations on the Coal of Nova Scotia, prepared by new methods. A number of beautifully preserved vegetable tissues were described, and the following general conclusions stated. 1st. The mass of the coal is of gymnospermous or cryptogamous origin, principally from sigillaria and calamites, and accumulated by growth *in situ*. 2d. The rate of accumulation of coal must have been very slow. The sigillaria were allied in structure to cycads and conifers, and it is chiefly their bark and woody axes that occur in the coal. In a vertical foot of coal we may have the bark of a hundred successive generations of trees. The climate of the coal-producing eras was equable and moist as in the islands of the southern hemisphere at the present day. The coal forests were dense and covered large plains; as the trees fell they gradually decayed, and a dense vegetation soon covered the whole mass. The growth of sigillaria was more rapid than that of trees of the present day of like size, but their structure proves that they did not spring up in a month or two as some have supposed.

DEVONIAN GRANITES AND TACONIC ROCKS.

Prof. Hitchcock of Amherst then read a short paper giving an account of a deposit of fossiliferous limestone beneath granite and mica slate in Derby, Vt. He wished to call attention to this locality, as he had found something new to him, and leading to different conclusions than those commonly held. This deposit occurs near Lake Memphremagog. He showed by diagrams the granite overlying the limestone, and what was singular, the former dipped down into the latter in veins and there terminated. He

called on Sir William Logan of Montreal for his views on the subject.

The latter said that on the Canada side of the boundary line this limestone had been traced from Memphremagog lake near Derby, to the Gulf of St. Lawrence in Gaspé, a distance of 500 miles. It was well stored with fossils at several places, and appeared to be partly Upper Silurian and partly Devonian. One of the localities of fossils was Memphremagog lake, when the fossils appeared to be allied to Devonian forms. In this neighbourhood there are masses of granite. Bebee's plain bordering on the lake presents an area of thirty-six square miles of granite from which emanate dykes cutting and dislocating the calcareous strata. From this it is evident the granite is newer than the limestone, and therefore may well be found occasionally to overlie it. The granite he considered to be of the same age as that so widely extended in New Hampshire and Maine; it had been traced to New Brunswick, and at Bathurst was found to underlie the coal formation. Its age would thus be Devonian On the west side of the Green Mountain range there was a calcareous area related to the limestones of Rutland, which, from a section he had lately made eastward from Lake Champlain in the neighbourhood of Burlington, he considered to be of the same age as that at Memphremagog.

Mr. J. P. Lesley of Philadelphia, said that since Sir William Logan had informed them, that he had lately been making some investigations in Vermont, he would probably be able to state some opinion in regard to the Taconic rocks.

Sir William Logan replied that having been referred to the black slate outside of Sharp-Shins near Burlington, as an instance of Taconic slates, these he had found lying conformably beneath the magnesian limestones of the same point, and at Apple-tree Point on the outside of this he had found, among similar slates, *Triarthrus Beckii*, a fossil known to belong to the shales of the Lower Silurian series. The magnesian limestone and the black shales beneath, he had traced in the same relation almost without a break, to the Canada boundary. From Quebec he had traced black shales and magnesian limestone, in the same relation to the same point on the boundary line. At Quebec both the shales and the limestone were characterized by rock-marked fossils. The fossils of the shales were those of the Utica slate and Hudson River Group, and he had no doubt that the slates of Sharp-Shins were of the same age.

ON THE LAURENTIAN LIMESTONES.

Sir William Logan exhibited to the section, a map on which was delineated in detail on the scale of an inch to a mile, the distribution of some of the bands of crystaline limestone interstratified with the gneiss of the Laurentian series of rocks on the north side of the Ottawa River, about forty miles above Montreal. This he explained was a continuation of similar work shown at the Montreal meeting of the association. By his recent exploration, two additional bands of limestone had been ascertained to underlie the lowest of those previously examined, the whole of the strata associated with these lower three, including the limestones, being supposed to be about 15000 feet thick. These three bands are separated from one another by gneiss, a large portion of which is porphyroid or coarse-grained, the feldspar being almost wholly orthoclase, whereas, as was stated at the Montreal meeting, calcareous bands above them are largely associated with labradorite. Intercalated with the coarse and massive orthoclase gneiss, were frequent beds, which may be characterized as mica slate, and approaching the calcareous bands are beds of hornblende rock, and quartz rock, these latter, and sometimes bands of nearly pure white orthoclase, when immediately near the limestone or interstratified with it, being very often thickly studded with pink garnets, one of the beds of white and nearly pure quartz rock, which was traced for a mile and a-half, presented a thickness of 1000 feet. No instance of clay slates was met with.

These ttrata are exceedingly corrugated, and the outcrop of the limestone presents a multitude of sharp turns resulting from small plications subordinate to more important synclinal and anticlinal forms, the axes of which appear to run nearly north and south. Some of these axes have now been traced up the Rouge, a tributary of the Ottawa, for a distance of fifty miles in a straight line.

Although the Laurentian series has hitherto been considered azoic, a search for fossils in them has not been neglected. Such search is naturally connected with great difficulties. Any organic remains which may have been entombed in these limestones, would, if they retained their calcareous character, be almost certainly obliterated by crystalization, and it would only be through their replacement by a different mineral substance that there would be a chance of some of the forms being preserved. No such instances had been observed on the investigations of the Rouge and its

vicinity, but from another locality in the Laurentian formation, Mr. John McMullin, one of the explorers of the Geological Survey had obtained specimens well worthy of attention. They consisted of parallel or apparently concentric layers resembling those of the coral *Stromatocerium*, except that they anastomoze at various parts, the layers consist of crystaline pyroxene, while the interstices are filled with crystalized carbonate of lime. These specimens had recalled to recollection others which had been obtained from Dr. Wilson of Perth some years ago, and had not then been regarded with sufficient attention. In these similar forms are composed of green serpentine, concretionary while the interstices are filled with white dolomite. If it be supposed that both are the result of mere unaided mineral arrangement, it would seem strange that identical forms should result from such different minerals in places so far apart. If the specimens had been obtained from the altered rocks of the Lower Silurian series, there would have been little hesitation in pronouncing them to be fossils. The resemblance of these forms to *Stromatocerium* from the Birds-eye limestone, when the coral has been replaced by concretionary silica is very striking. In the pyroxenic specimens, the pyroxene and the carbonate of lime being both white, the forms although weathered into strong relief on the surface, are not perceptible in fresh fractures until the fragments are subjected to an acid, the application of which shows the structure running throughou thet mass. Several specimens of these supposed fossils were exhibited to the Section.

ART. XXIII.—*Description of a new Genus of Brachiopoda, and on the Genus Cyrtodonta.* By E. BILLINGS.

(From Report of Geological Survey, 1858 and '59, unpublished.)

Genus CAMERELLA, Billings.

Generic characters.—Family Rhynconellidæ; ventral valve, with a small triangular chamber beneath the beak, supported by a short mesial septum as in *Pentamerus*. Dorsal valve, with a single mesial septum and two short lamellæ for the support of the oral appendages, as in *Rhynconella*.

CAMERELLA VOLBORTHII, Billings.

Description.—Small, nearly globular; ventral valve, with a broad mesial sinus which deeply indents the opposite valve, but

becomes obsolete at about half the distance to the beak; a corresponding elevation on the dorsal valve. On each side of the mesial sinus and elevation there are three short plications; there also three on the elevation of the dorsal valve, and two in the sinus of the ventral valve; beak of ventral valve short, incurved at the point, but elevated above and not in contact with the umbo of the dorsal valve; the beak of the latter strongly incurved. Length, five lines; width, four lines and a half; depth of both valves, four lines.

Locality and formation.—Black River Limestone, Pauquette's Rapids.

CAMERELLA PANDERI, Billings.

Description.—In this species some of the specimens are nearly circular, in others the length is one-fourth greater than the width; both valves evenly convex; a broad, obscure sinus in the front of the ventral valve, which extends one-fourth the distance to the beak; a corresponding elevation in the dorsal valve. The front of each valve is also marked with several very obscure indentations, of which the sinus has one or two, and the mesial elevation of the dorsal valve two or three. Beak of ventral valve short, incurved, but not in contact with the umbo of the other valve. Beak of dorsal valve strongly incurved. Length, four or five lines; width, equal to or a little less than the length.

Locality and formation.—Black River Limestone, Pauquette's Rapids.

CAMERELLA LONGIROSTRA, Billings.

Description.—This little species has much the form of *C. Panderi*, except that the beak of the ventral valve is very much elongated and erect, or only slightly curved at the point. There are no plications in the front of the valves, but only a single smooth-rounded mesial fold and sinus. Length of ventral valve, four lines and a half, width three lines; length of dorsal valve, three lines and a half; length of beak of ventral valve, one line. These measurements refer to a single specimen, the only perfect one collected. It may be hereafter ascertained that the species is much longer.

Locality and formation.—Chazy, Mingan Islands. Collected by Sir W. E. Logan.

Genus CYRTODONTA, Billings.

In this genus, including its sub-genus *Vanuxemia*, the number of teeth is variable. There are from two to eight anterior, and from two to four posterior teeth. When I described the genus I figured several species with three anterior teeth, and stated that *C. rugosa* appeared to have four, while *V. Bayfieldii* was represented with seven. It would appear also that Professor Hall has observed a species with five, as he has stated in a recent publication that the genus has three, four or five anterior teeth. During the present year, Mr. Bell, of the Geological Survey, has collected many specimens, apparently of several species, which exhibited two, three, four, six and in one apparently eight anterior teeth. It is quite clear, therefore, that the number is variable, as stated by me in my description of the sub-genus. In consequence of these discoveries, the only distinctive character of the sub-genus *Vanuxemia* is the terminal position of the beaks, and it may be necessary to suppress it altogether.

MISCELLANEOUS.

Lower Carboniferous Coal-Measures of British America. A paper by Principal Dawson giving an account of the present state of knowledge respecting these interesting beds and their fossils, was read before the Geological Society of London, at its meeting of April 28th. The following is from Abstracts of Proceedings of the Society.

"Deposits indicating the existence of the Coal-flora and its associated freshwater fauna at the beginning of the Carboniferous period, are well developed in Nova Scotia and New Brunswick, with a clearness and fullness of detail capable of throwing much light on the dawn of the terrestrial conditions of the Coal-period, and on the relations of these lower beds to the true coal measures. This lower series comprises shales and sandstones (destitute of marine remains, but containing fossil plants, fishes, entomostraca worm-tracks, ripple and rain marks, sun cracks, reptilian footprints, and erect trees) and great overlying marine limestones and gypsums. These are distinct from the true coal-measures by their position, mineral character, and fossil remains. In the western part of Nova Scotia (Horton, Windsor, &c.) the true (or Upper and Middle) Coal-measures are not developed; and here the Lower Carboniferous marine deposits attain their greatest

thickness. The lower coal-measures (or Lower Carboniferous freshwater or estuarine deposits) have here a thickness of about 600 feet. These beds are traceable as far as the Shubenacadie and Stewiacke Rivers. They outcrop also on the south side of the Cobequid Mountains, where the marine portion is very thin, owing perhaps to the fact of these mountains having been land in the coal-period.

Along the northern side of the Cobequid Range, the upper and middle coal-measures and the marine portion of the Lower Carboniferous series are of great thickness. The lower beds are absent here, though brought up on the northern side of the coaltrough of Cumberland, where in New Brunswick (Petitcodiac River, &c.), they are remarkable for their highly bituminous composition, their well-preserved fish-remains, and the almost entire absence of plants. To the north, at the Bay of Chaleurs, the great calcareous conglomerate, with sandstone and shale, 2766 feet thick, described by Logan, and containing a few plant-remains, probably represent the Lower Coal-measures of Nova Scotia. In eastern Nova Scotia and Cape Breton the Middle Coal measures are found at Caribou Cove and elsewhere; the marine limestones and gypsums, and the underlying sandstones and shales, are seen at Plaister Cove; also at Right's River, and St. Mary's River.

In Nova Scotia these older coal-measures, as compared with the true coal-measures, are more calcareous, more rich in remains of fishes, and have fewer vegetable remains, and indications of terrestrial surfaces. They occur generally along the margins of the coal-areas, near their old shores; and, as might be expected under such circumstances, they are associated with or replaced by beds of conglomerate derived from the neighbouring highlands of Devonian or Silurian rocks. When the conglomerates are absent, alternations of sandstones with sandy and calcareous shales occur, with frequent changes in character of the organic remains. The general aspect being that of muddy estuarine deposits, accumulated very slowly, and discoloured by decaying organic substances. The supply of sediment, and the growth and preservation of vegetable matter, appear to have been generally on a smaller scale in this early carboniferous period than subsequently. In those districts where the true coal-measures are least developed the lower series is most important; showing that the physical and vital conditions of the Coal-measures originated as early as those of the Moun-

tain-limestone; and that locally these conditions may have been contemporaneous throughout the whole period; but that in some localities the estuary and swamp deposits first formed were completely submerged and covered by oceanic deposits, whilst in others early marine beds were elevated and subjected to the conditions of gradual subsidence and vegetable growth indicated in the great coal-measures of the South Joggins, Pictou, and Sidney.

In Nova Scotia the Lower Coal-measures are characterized by a great preponderance of *Lepidodendra* (especially *L. elegans*) and *Poacites*, with few ferns or *Sigillariæ*. The middle Coal-measures are rich in *Sigillariæ* and Ferns, as well as *Lepidodendra*. The Upper Coal-measures especially abound in Conifers, Calamites, and Ferns. *Palæoniscus*, *Gyrolepis* or *Acrolepis*, *Centrodus*, *Rhizodus*, and *Ctenacanthus* are the chief fossil fishes of this Lower Carboniferous series. Unio-like shells are nearly the only remains of Molluscs.

Donations to the Library of the Natural History Society of Montreal. 1858 *and* 1859.

Translated Report of a recent Meeting of a Philosophical Society in Germany; by Mr. Gordon.

Description of New Fossils from Coal Measures of Missouri and Kansas; by T. Shumard and G. C. Swallow.

Pamphlet on Grape Culture in Missouri; by G. C. Swallow, Esq.

A set of Presidents' Anniversary Addresses, delivered before the Geological Society of London from 1846 to 1857 (the years 1847 and 1851 excepted); from Dr. Gibb, London.

Proceedings of the Essex (U. S.) Institute, Vol. II., Part I., 1856 to 1857; from the Institute.

Reply to the Statement of the Trustees of the Dudley University, U. S.; from Benjamin Aythorp Gould, Jr.

Relations des Jésuits; from the Government of Canada.

The Journal of Education; The Canada Official Gazette; Journals of Legislative Assembly; Medical Chronicle; The Statutes of Canada.

Donations to the Museum of the Natural History Society of Montreal. 1858 *and* 1859.

Large Egg; from Mr. Ewing.

Specimen of a Neuropterous Insect; by Charles Sharpley, Esq.

The following from Alex. Bell, of Euphemia, through Edward Little, of Newburg, C. W. :—

1. A Wart taken from the root of a soft-maple tree (*Acer. dasycarpum*) fully 26 feet from the living trunk, the root to which it was attached not exceeding one inch in diameter at its junction in either end. 1856.

2. An Arrow nearly one yard in length, one of a full quiver of fifty from Upper California, now in possession of a gentleman who, after being pierced with two of them, despatched the Indian and brought the bow and arrow home. The quiver is made of tanned deerskin, with the hair on. The arrow is made of two different kinds of wood and spliced very neatly; it is also barbed with three feathers. The stone head is remarkably sharp and neatly made.

3. An Oak Deer-bleat, given to the donor by the Indian Shauriabee in 1846, and stated by him to be his own manufacture.

4. A Stone Arrow-head 1½ inches long, found ten feet under ground on Lot 21, Euphemia, C. W., shewing a striking analogy between the Californian and Canadian weapon.

5. An Oval Stone Hatchet about 4 inches long by 2½ broad, ¾ inch thick, well polished and perforated across its breadth, the aperture half an inch in width. The stone is a very jasperry slate, transversely marked with natural lines. This instrument was obtained in 1854 below the surface of the ground on the margin of the River Sydenham, Lot 12, First Concession, Brooke, C. W.

6. A Horse's Tooth. (For particulars see page 317 of the *Naturalist* for August, 1858.)

7. A piece of fossiliferous limestone from Newburg, C. W.

A true specimen of *Datura Wrightii Metallides;* from William Lunn, Esq.

Snout of a Sword-fish; from Captain Lafontaine.

A Thermometer; from Dr. Gibb, London.

Two portions of Strata from bed of the St. Lawrence; from Captain Dutton.

Two specimens of *Coronula Diadema* from whales in the Gulf of St. Lawrence; from Principal Dawson.

Twenty-one Chinese Tiles; from Dr. Gibb, London.

Box of Ores; from —— Wilgress, Esq.

A Box of Specimens from Pompeii; from Dr. W. Jones.

A Belt-plate of the Royal 60th Regiment; from ditto.

The Rattle of a Rattlesnake; from ditto.

Bamboo or Cane-stick, with curious knotted head (from the Mauritius); from ditto.

Fossil Plants from Devonian Rocks of Gaspé; from Principal Dawson, President of the Society.

Antelope Furcifer, from the plains of the Saskatchewan; from Geo. Barnston, Esq.

Tetrao Richardsoni, male and female, from the Rocky Mountains, lat. 65 degrees N.; from ditto.

Embryo Salmon; from James Ferrier, Jr., Esq.

A Concretion from the Caen stone used in the construction of the new English Cathedral; from Mr. Hutchinson, builder.

A Systematic List of Coleoptera found in the Vicinity of Montreal. By W. S. M. D'URBAIN.

The following list, being the result of hardly two seasons' collecting, contains only a small portion of the *Coleoptera* to be found in the neighbourhood of Montreal, but is nevertheless offered as a contribution to the Entomology of Canada, in the belief that it will be useful in ascertaining the geographical distribution of the species enumerated, nearly all of which have been determined by the eminent coleopterist, Dr. J. L. Leconte of Philadelphia, to whom I here beg to return my sincere thanks for his kindness in naming a large number of specimens for me.

GEODEPHAGA.

1. Family *Cicindelidæ*, Kirby.

1. Cicindela, *Linn.* (See Trans. Amer. Phil. Soc., Vol. XI., new series, p. 27.)
   C. sexguttata, *Fabr.* Common, May and June.
   C. purpurea, *Oliv.* Extremely abundant on sandy places from April to August; several remarkable varieties occur.
   C. vulgaris, *Say.* (obliquata, *Dej.*) Very abundant, with the preceding species.
   C. duodecim-guttata, *Dej.* (proteus, *Kirby.*) In the same places, but not so numerous as the two last species, May.
   C. Baltimorensis, *Herbst.* (repanda, *Dej.*) Rather scarce, May to July.

2. Fam. *Carabidæ*, Leach.

1. Sub-fam. *Brachinides*, Westw.

1. Lebia, *Latr.*
   L. tricolor, *Say.* One specimen taken on the Mountain in October.
   L. fuscata, *Dej.* Rare, by sweeping herbage on the Mountain in June.
   L. axillaris, *Dej.* Rare, by sweeping herbage on the Mountain in June.
   L. viridis, *Say.* Rare, on the Mountain in October.
   L. pumila, *Dej.* Abundant on flowers of *Solidago* in August.
2. Cymindis, *Latr.* (Tarus, *Clairville.*)
   C. pilosa, *Say.* Rare, under bark of dead stumps on the Mountain.
   C. reflexa, *Lec.* (marginata, *Kirby?*) Common under stones, bark of dead stumps, &c., on the Mountain, May.

3. Brachinus, *Weber.*
   (*Several species, not determined.*) Common, under stones.

2. Sub-fam. *Scaritides*, Westw.

4. Dyschirius, *Bon.* (See Proc. Acad. Nat. Sci. Phila., Vol. IX. p. 75.)
   D. globulosus, *Putz.* Under stones on the Mountain, May.

3. Sub-fam. *Harpalides*, Westw.

5. Patrobus, *Dej.*
   P. longicornis, *Say.* Under stones, Montreal and Belœil Mountains, May and June.
6. Platynus, *Bon.* (Agonum and Anchomenus, *Bon.*) (See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 40.)
   P. sinuatus, *Dej.* Abundant under bark of stumps, swamp near Mile-end road, September.
   P. melanarius, *Dej.* Under stones, sides of the Mountain, May.
   P. Harrisii, *Lec.* One specimen taken under a stone N.E. side of the Mountain, April.
   P. atratus, *Lec.* One specimen taken with the last species.
   P. cupripennis, *Say.* Abundant under stones, &c., everywhere.
   P. obsoletus, *Say.* Very numerous in the old Museum of the Nat. Hist. Soc., Little St. James St., May to August, 1857; flies to light at night.
   P. stigmosus, *Lec.* Not common, under stones.
7. Pœcilus, *Bon.* (See Journ. Acad. Nat. Sci. Phila., Vol. II. new series, p. 253.)
   P. lucublandus, *Dej.* Extremely abundant under stones every where, especially in early spring.
8. Pterostichus, *Bon.* Feronia, *Latr.* (See Journ. Acad. Nat. Sci. Phila., Vol. II., new series, p. 234.)
   P. mutus, *Say.* Abundant under stones, Montreal and Belœil Mountains, May and October.
   P. erythropus, *Dej.* Under stones on the Mountain, May.
   P. adjunctus, *Lec.* Under stones, sides of the Mountain, May.
   P. mandibularis? *Kirby.* Under stones, sides of the Mountain.
9. Amara, *Latr.* (See Proc. Acad. Nat. Sci. Phila., Vol. VII., p. 346.)
   A. angustata, *Say.* One specimen taken by sweeping herbage, sides of the Mountain, June.
   A. impuncticollis, *Say.* Under stones.
   A. interstitialis, *Dej.* (inæqualis, *Kirby.*) Not uncommon in spring.
   A. obesa, *Say.* Not common, under stones.
10. Agonoderus, *Dej.*
   A. pallipes, *Dej.* Not uncommon under stones on the Mountain slopes.
11. Anisodactylus, *Dej.*
   A. Baltimorensis, *Say.* Common under stones, &c., Montreal and Laprairie.
   A. Harrisii, *Lec.* (agricola, *fide Harris.*) Not common, under stones.

12. Harpalus, *Latr.*
    H. Pensylvanicus, *Geer.* (bicolor, *Fabr.*) Abundant under stones. In vast numbers at dusk running over the fields near Laprairie, in September.
    H. viridiæneus, *Beauv.* Abundant under stones, Montreal and Sorel.
    H. herbivagus, Say. In great abundance under stones, &c., Montreal, Laprairie, Belœil Mountain, and Sorel, April to October.
13. Bradycellus, *Erich.* (Geobænus, *Lec.*)
    B. rupestris, *Say.* (Trechus flavipes, *Kirby.*) Common under stones, sides of the Mountain, and at Sorel under dry cowdung.
14. Stenolophus, *Dej.*
    S. conjunctus, *Say.* By sweeping herbage on the Mountain in June; common under stones, Belœil Mountain, in May.
    S. inops, *Lec.* One specimen taken under a stone, Belœil Mountain, May.
15. Chlænius, *Bon.* (See Proc. Acad Nat. Sci. Phila., Vol. VIII. p. 25.)
    C. sericeus, *Forst.* Extremely abundant under stones everywhere.
    C. chlorophanus, *Dej.* Common under stones, shores of islands above Lachine.
    C. tricolor, *Dej.* Abundant under stones.
    C. Pensylvanicus, *Say.* (vicinus, *Dej.*) Not so common as the last species.
    C. circumcinctus, *Say.* Rare.
    C. impunctifrons, *Say.* Rare, Belœil Mountain.
    C. tomentosus, *Say.* Logan's farm, June.

4. Sub-fam. *Carabides*, Westw.

16. Carabus, *Linn.*
    C. serratus, *Say.* Under stones; most numerous at Sorel.
17. Calasoma, *Weber.*
    C. calidum, *Fabr.* Very abundant everywhere.
18. Elaphrus, *Fabr.*
    E. Californicus, *Mann.* (var. punctatissimus, *Lec.*) Rare.

5. Sub-fam. *Bembidiides*, Westw.

(See Proc. Acad. Nat. Sci. Phila., Vol. IX., p. 2.)

19. Bembidium, *Latr.* (Ochthedromus, *Lec.*)
    B. lucidum, *Lec.* Abundant under stones and in damp yards, May and June.
    B. patruelis, *Dej.* Taken by sweeping herbage, Logan's farm, June.
    B. versicolor, *Lec.* (variegatum, *Kirby.*) Taken by sweeping, Logan's farm, June.
    B. rupestre, *Dej.* One specimen taken in the yard of the old Nat. Hist. Soc. Museum, Little St. James Street, June 1857.
20. Tachys, *Knoch.*
    T. inornatus, *Say.* Numerous under bark of a dead pine on the Mountain, May; and Mile-end road, September, 1857.

HYDRADEPHAGA.

1. Fam. *Dytiscidæ*, Leach.

1. Sub-fam. *Dytiscinæ*.

1. Dytiscus, *Linn.*
   D. fasciventris, *Say.* (Carolinus, *Aubé.*) Rare, ditches on the Lachine Railway, April.
2. Acilius, Leach.
   A. fraternus, *Harris.* Extremely numerous in small pools on the sandy common between St. Catherine and Sherbrooke Streets May.

2. Sub-fam. *Colymbetinæ*.

3. Colymbetes, *Clairville.*
   C. triseriatus, *Kirby.* One specimen taken in a pond near Mile-end toll-bar, May 7th, 1857.
   C. binotatus, *Harris.* In a pond on the common at Laprairie, May 13th, 1857.
4. Ilybius, *Erichs.*
   I. biguttulus, *Germ.* In a small pool in a field at the head of St. Denis Street, August 27, 1857.
5. Agabus, *Leach.*
   A. striatus? *Say.* In ponds, June.
   A. (*not named.*) In a running stream on the common between St. Catherine and Sherbrooke Streets, May 7th, 1857.
6. Laccophilus, *Leach.*
   L. maculosus, *Say.* Abundant in streams and ponds, Montreal and St. Hilaire.

3. Sub-fam. *Hydroporinæ*.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII., p. 290.)

7. Hydroporus, *Clairville.*
   H. similis, *Kirby.* Numerous in a pond at the head of St. Denis Street, April 1857.
   H. modestus, *Aubé.* In small ponds between St. Catherine and Sherbrooke Streets West, beginning of May.
   H. nanus, *Aubé.* Very abundant in ponds between St. Catherine and Sherbrooke Streets West, and at St. Hilaire, May.

Sub-fam. *Haliplinæ*.

8. Haliplus, *Latr.*
   H. immaculaticollis, *Harris.* Stream on Logan's farm, October.
9. Cnemidotus, *Illig.*
   C. duodecim-punctatus, *Say.* Very abundant in a stream on Logan's farm, October.

2. Fam. *Gyrinidæ*, Leach.

1. Gyrinus, *Geoff.*
   G. lateralis, *Aubé.* Pools on the common between St. Catherine and Sherbrooke Streets West, May.
   G. (*not determined.*) Pools on the common between St. Catherine and Sherbrooke Streets West, May.
   G. (*not named.*) Pools and streams, May to October.

2. Dineutes, *Brulle.*
   D. (*not determined.*) Abundant in the St. Lawrence, Lachine, &c.

PHILHYDRIDA.

Fam. *Helophoridæ*, Leach.

1. Helophorus, *Fabr.* (See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 357.)
   H. lacustris, *Lec.* In small pools, Montreal and Laprairie, May and August.
   H. lineatus, *Say.* In the streams on Logan's farm, October.

Fam. *Hydrophilidæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 356.)

1. Berosus, *Leach.*
   B. striatus, *Say.* Abundant in streams and ponds, Montreal and St. Hilaire, May.
   B. infuscatus, *Lec.* One specimen taken in a pool near Sherbrooke Street, May 4th, 1857.
2. Hydrophilus, *Geoff.*
   H. glaber, *Hbst.* Common in running streams, June to October.
3. Hydrocharis, *West.*
   H. obtusatis, *Say.* Not common, pools between St. Catherine and Sherbrooke Streets West, May.
4. Hydrobius, *Leach.*
   H. regularis, *Lec.* Ponds, Montreal and St. Hilaire, May.
5. Laccobius, *Erich.*
   L. agilis, *Randall.* Pools on the common between St. Catherine and Sherbrooke Streets West, end of May, 1857.

Fam. *Sphæridiidæ*, Leach.

1. Cercyon, *Leach.* (See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 374.)
   C. flavipes, *Lec.* In a decayed cabbage near McTavish House, May 11th, 1857.
   C. centrimaculatum, *Lec.* By sweeping grass, Logan's farm, August and October.

NECROPHAGA.

1. Fam. *Silphidæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. VI. p. 274.)

1. Necrophorus, *Fabr.*
   N. orbicollis, *Say.* Rare.
   N. velutinus, *Fabr.* Common.
2. Silpha, *Linn.*
   S. surinamensis, *Latr.* Abundant under dead animals.
   S. Lapponica, *Hbst.* Abundant under dead animals.
   S. marginalis, *Fabr.* Abundant under dead animals.
   S. Americana, *Linn.* Not common.
   S. inæqualis, *Fabr.* Rarely met with. Several pairs taken under a small dead snake in 1850.

BRACHELYTRA.

Fam. *Staphylinidæ*, Leach.

1. Sub-fam. *Aleocharinæ.*

1. Falagria, *Leach.*
   F. dissecta, *Erichs.* Abundant in cow-dung, Montreal and Sorel.
2. Homalota, *Mann.*
   (*Five undetermined species.*) Taken abundantly under stones, bark of trees, stumps, &c., and by sweeping grass.
3. Aleochara, *Grav.*
   A. bimaculata, *Grav.* In cow-dung, abundant.
   A. (*not determined.*) By sweeping grass, Logan's farm, June 1857.
4. Tachyporus, *Grav.*
   T. acaudus, *Say.* Swept from herbage on the Mountain, June.
   T. jocosus, *Say.* Under stones, June.

2. Sub-fam. *Tachininæ.*

5. Tachinus, *Grav.*
   T. ventriculus, *Say.* Abundant under bark of dead pines and under stones on the Mountain.
   T. (*not named.*) In cow-dung on the Mountain, September 1856.
6. Othius, *Leach.*
   O. (*not determined.*) Under bark of a maple stump on the Mountain, May 20th, 1857.

3. Sub-fam. *Staphylininæ.*

7. Heterothops, *Kirby.*
   H. (*not determined.*) August, 1856.
8. Xantholinus, *Dahl.*
   X. obsidianus, *Mels.* In cow-dung.
   X. cephalus, *Say.* Under bark of stumps. Montreal and Sorel.
9. Staphylinus, *Linn.* (Creophilus, *Kirby.*)
   S. villosus, *Grav.* Abundant under dead animals everywhere.
   S. cingulatis, *Grav.* Not very common, under dead animals.
   S. cinnamopterus, *Grav.* Rare under stones, in back yards, &c. in the city.
   S. violaceus, *Grav.* Abundant under stones and bark of decayed stumps on the Mountain.
10. Philonthius, *Leach.*
    P. æneus, *Grav.* Abundant under stones, sides of the Mountain.
    P. Harrisii, *Mels.* One specimen taken under a stone on the Mountain, May 19th, 1857.
    (*Several other species not determined.*)
11. Quedius, *Leach.*
    Q. (*not determined.*) Under stones, fields near Mile-end road, and in back yards.
12. Lathrobium, *Grav.*
    L. puncticolle, *Kirby.* In cow-dung.
    L. (*not named.*) Abundant under stones, Mile-end road, and at Laprairie, in May.

13. Cryptobium, *Mann.*
    C. pallipes, *Grav.* Under stones, Mile-end road, May 1857.

4. Sub-fam. *Steninæ.*

14. Lithocaris, *Erich.*
    L. confluens, *Say.* Common in cow-dung on the Mountain, Oct.
15. Sunius, *Leach.*
    S. discopunctatus, *Say.* Common under stones in fields near Mile-end road, May.
16. Pœderus, *Fabr.*
    P. littorarius, *Grav.* Common under stones in fields near Mile-end road, May.
17. Stenus, *Latr.*
    S. flavicornis, *Erich.* By sweeping herbage, sides of the Mountain June.

5. Sub-fam. *Oxytelinæ.*

18. Platystethus, *Mann.*
    P. Americanus, *Erich.* Abundant under dead animals, and by sweeping herbage, August.
19. Oxytelus, *Grav.*
    O. sculptus, *Grav.* One specimen taken under a stone, Simpson Street, April 1857.
    O. Pensylvanicus, *Erichs.* In cow-dung.

HELOCERA.

1. Fam. *Histeridæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. VI. p. 37.)

1. Platysoma, *Leach.*
    P. Lecontei, *Marseul.* Under bark of trees, Montreal and Belœil Mountains.
2. Hister, *Linn.*
    H. abbreviatus, *Fab.* Common under dead animals, and in horse-dung.
    H. perplexus, *Lec.* (?) Under stones, sides of the Mountain.
    H. Americanus, *Payk.* Under stones and in cow-dung, Montreal and Sorel, May.
3. Saprinus, *Erich.*
    S. assimilis, *Payk.* Under dead animals and in cow-dung.
    S. distinguendus, *Lec.* In cow-dung, Montreal and Sorel.

2. Fam. *Phalacridæ*, Schaum.

(See Proc. Acad. Nat. Sci. Phila., Vol. VIII. p. 15.)

1. Olibrus, *Erich.*
    O. apicalis, *Mels.* On thorn-blossoms and by sweeping grass, June.

3. Fam. *Nitidulidæ*, MacLeay.

1. Phenolia, *Erich.*
    P. grossa, *Fabr.* One specimen taken under bark of a dead stump on the Mountain, August 24th, 1856.
2. Omosita, *Erich.*
    O. colon, *Linn.* Numerous under dead animals, &c., June.

4. Fam. *Engidæ*, MacLeay.

1. Ips. *Herbst.*
   I. fasciatus, *Oliv.* Not very common.
   I. quadrisignatus, *Say.* Extremely abundant in decaying vegetable matter, and flying in May.

5. Fam. *Cucujidæ*, Westw.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 73.)

1. Læmophlæus, *Dej.*
   L. fasciatus, *Mels.* By sweeping grass on Logan's farm, August.
2. Silvanus, *Latr.*
   S. Surinamensis, *Linn.* Rare in houses.

6. Fam. *Cryptophagidæ*, Schaum.

1. Cryptophagus, *Herbst.*
   C. (*not determined.*) Under a dead rat in a cellar, Little St. James Street.
2. Atomaria, *Kirby.*
   A. (*not determined.*) Abundant by sweeping herbage on the Mountain, June.

7. Fam. *Lathridiidæ.*

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 299.)

1. Corticaria, *Marsham.*
   C. Americana, *Mann.* By sweeping grass, June.
2. Lathridius, *Illig.*
   L. reflexus, *Lec.* By sweeping grass, Logan's farm, October.

8. Fam. *Dermestidæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 106.)

1. Byturus, *Latr.*
   B. unicolor, *Say.* By sweeping herbage on the Mountain, June.
2. Dermestes, *Linn.*
   D. lardarius, *Linn.* Abundant in houses; very destructive to preserved specimens of natural history: also under bark of trees in autumn.
3. Attagenus, *Latr.*
   A. megatoma, *Fabr.* Abundant in houses, and very destructive to preserved specimens of natural history.

9. Fam. *Byrrhidæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 113.

1. Byrrhus, *Linn.*
   B. picipes, *Kirby.* Common.
   B. Americanus, *Lec.* Rare.
2. Cytilus, *Erich.*
   C. varius, *Fabr.* Rare, May.

LAMELLICORNES.

1. Fam. *Lucanidæ*, Leach.

1. Platycerus, *MacLeay.*
   P. depressus, *Lec.* Under bark of stumps on the Mountain.

2. Fam. *Geotrupidæ*, MacLeay.

1. Geotrupes, *Latr.*
   G. Blackburnii, *Fabr.* Very numerous about fresh horse-droppings at dusk.
   G. Egeriei, *Germ.* (Miarophagus, *Say.*) Woods on Belœil Mountain.
   G. excrementi, *Say?* In horse-dung on the Mountain.

3. Fam. *Scarabeidæ*, MacLeay.

1. Onthophagus, *Latr.*
   O. Hecate, *Pz.* Abundant in cow-dung, Montreal and Sorel.

4. Fam. *Aphodiidæ*, MacLeay.

1. Aphodius, *Illig.*
   A. fimetarius, *Fabr.* Very abundant in cow-dung everywhere.
   A. granarius. Under stones, and in great abundance in a decayed cabbage, May 1857; also in cow-dung at Sorel.
   A. curtus, *Hald.* In cow-dung.
   A. vittatus, *Lec.* In cow-dung, Montreal and Sorel.
   A. striatulus, *Say.* In horse-dung.
2. Euparia, *Lep.* and *Serv.*
   E. stercorator, *Hald.* One specimen taken under a stone on the Mountain, May.

5. Fam. *Trogidæ*, MacLeay.

(See Proc. Acad. Nat. Sci. Phila., Vol. VII. p. 211.)

1. Trox, *Fabr.*
   T. variolatus, *Mels.* On boarded pathways, May.
   T. æqualis, *Say.* April, Belœil Mountain.
2. Omorgus, *Erich.*
   O. punctatus, *Germ.* Rare, May.

6. Fam. *Dynastidæ*, MacLeay.

1. Xyloryctes, *Hope.*
   X. satyrus, *Fabr.* One specimen said to have been taken on the north-west side of the Mountain.
2. Ligyrus, *Burm.* (See Proc. Acad. Nat. Sci. Phila., Vol. VIII. p. 19.)
   L. relictus, *Say.* One specimen said to have been taken in Montreal, and another at Lachine, July.

7. Fam. *Melolonthidæ*, MacLeay.

(See Journ. Acad. Nat. Sci. Phila., Vol. III. sec. series, p. 235.)

1. Lachnosterna, *Hope.*
   L. fusca, *Frolich.* Very abundant flying about trees at dusk in May.
   L. cognata, *Burm.* Rare, May.
2. Serica, *MacLeay.*
   S. vespertina, *Schonh.* Under stones, sides of the Mountain, May.
   S. sericea, *Illig.* With the last species.
3. Hoplia, *Illig.*
   H. trifasciata, *Say.* (primaria, *Burm.*) On thorn-blossoms, &c., May and June.
   H. tristis, *Mels.* (*male of the preceding*). With the last species.

8. Fam. *Cetoniidæ*, MacLeay.

1. Trichius, *Fabr.*
   T. piger, *Fabr.* On blossoms of clover and on roses, June and July.
2. Osmoderma, *Lep.*
   O. eremicola, *Knoch.* Not very common, August.
   O. scabra, *Beauv.* Abundant on dead stumps, and crawling on the trunks of hard maples on the Mountain, August.

STERNOXI.

1. Fam. *Buprestidæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. IX. p. 7.)

1. Chrysobothris, *Esch.* (Odontomus, *Kirby.*)
   C. dentipes, *Germ.* Not common, July.
2. Dicerca, *Esch.*
   D. divaricata, *Say.* Abundant July to October, in dead trees.
3. Ancylocheira, *Esch.*
   A. maculiventris, *Say.* Common, July.
   A. striata, *Fabr.* Rare.
4. Melanophila, *Esch.*
   M. longipes, *Say.* Not common, June and July.
   M. fulvoguttata, *Harris.* Rare.
5. Agrilus, *Lap.*
   A. (*not determined.*) One specimen taken on the window of a house, July 17th, 1857.

2. Fam. *Eucnemidæ*, Westw.

1. Throscus, *Latr.*
   T. constrictor, *Say.* One specimen taken in a house near Montreal, October 1856.

3. Fam. *Elateridæ*, Leach.

1. Asaphes, *Lec.* (?) (Hemicrepidius, *Germ.*)
   A. memnonius, *Hbst.* Flies to light at night in July.
   A. decoloratus, *Lec.* Abundant sitting on the heads of umbelliferous plants, July.
2. Cratonychus, *Dej.*
   C. scrobicollis, *Lec.* Under bark of stumps, and under stones, on the Mountain, May.
   C. laticollis, *Erich.* On thorn-blossoms, June.
   C. communis, *Schonh.* Rare.
3. Adelocera, *Latr.*
   A. brevicornis, *Lec.* (?) Under bark of stumps on the Mountain, and swamps near Mile-end road, spring and autumn.
4. Elater, *Linn.*
   E. nigricollis, *Hrbst.* In rotten stumps on the Mountain.
5. Cryptohypnus, *Erich.*
   C. salacipes, *Germ.* Abundant under stones on the Mountain, May.
6. Monocrepidius, *Lec.*
   M. dorsalis, *Say.* Under stones on grass, Montreal and Laprairie.

7. Corymbites, *Latr.*
   C. splendens, *Ziegl.* Under bark of a dead pine-stump, Laprairie.
   C. inflatus, *Say.* Rare.
   C. appressifrons, *Say.* Abundant on the Mountain in May.
8. Agriotes, *Erich.*
   A. mancus, *Say.* Under stones, and by sweeping herbage on the Mountain, June.
9. Dolopius, *Erich.*
   D. stabilis, *Lec.* By sweeping herbage on the sides of the Mountain, June.
   D. pauper, *Lec.* With the last species.

MALACODERMATA.

1. Fam. *Lycidæ*, Lec.

1. Digrapha, *Newm.*
   D. reticulata, *Fabr.* On the Mountain, June.

2. Fam. *Lampyridæ*, Leach.

(Sec. Proc. Acad. Nat. Sci. Phila., Vol. V. p. 331.)

1. Ellychnia, *Lec.*
   E. corrusca, *Linn.* Very abundant from April to October.
2. Pygolampis, *Lec.*
   P. marginella, *Lec.* This is the commonest firefly on the Mountain at night in July.
3. Photuris, *Dej.*
   P. Pensylvanica, *Geer.* (versicolor, *Fabr.*) Abundant, islands above Lachine, St. Hilaire and Sorel, June and July.

3. Fam. *Telephoridæ*, Leach.

(See Proc. Acad. Nat. Sci. Phila., Vol. V. p. 338.)

1. Chauliognathus, *Hentz.*
   C. Pensylvanicus, *Geer.* (bimaculata, *Fabr.*) Very abundant on the flowers of *Solidago*, Nun's Island and St. Hilaire, August.
2. Telephorus, *Geoff.*
   T. Carolinus, *Fabr.* By sweeping herbage, June.
   T. bilineatus, *Say.* On thorn-blossoms, June.
3. Podabrus, *Fischer.*
   P. rugulosus, *Lec.* Abundant by sweeping herbage, June.

4. Fam. *Cleridæ*, Westw.

1. Trichodes, *Herbst.*
   T. Nuttalii, *Kirby.* On blossoms of *Solidago*, Belœil Mountain, August.

5. Fam. *Ptinidæ*, Leach.

1. Ptinus, *Linn.*
   P. fur, *Linn.* Common in old houses.

6. Fam. *Anobiidæ*, Westw.

1. Anobium, *Fabr.*
   A. foveatum, *Kirby.* In dead wood.

HETEROMERA.

1. *Trachelia*, Westw.

1. Fam. *Anthicidæ*.

(See Proc. Acad. Nat. Sci. Phila., Vol. VI. p. 91.)

1. Anthicus, *Payk.*
   A. (*not determined.*) By sweeping herbage on the Mountain, June.

2. Fam. *Meloidæ.*

(See Proc. Acad. Nat. Sci. Phila., Vol. VI. p. 328.

1. Meloe, *Linn.*
   M. rugipennis, *Lec.* Common.
1. Asclera, *Schmidt.* (See Proc. Acad. Nat. Sci. Phila, Vol. VII. p. 20.
   A. ruficollis, *Say.* Very abundant in blossoms of *Erythronium maculatum* on the Mountain, May 1857.

4. Fam. *Melandryidæ*, Leach.

1. Melandrya, *Fabr.*
   M. striata, *Say.* Under bark of dead stumps on the Mountain, June.
2. Hypulus? *Payk.*
   H. (*not determined.*) One specimen taken in the old Museum of the Natural History Society, in Little St. James Street, Aug. 1857.

2. *Atrachelia*, Westw.

1. Fam. *Cistelidæ*, Leach.

1. Mycetocharus, *Latr.*
   M. (*not determined.*) Rare, July.
2. Cistela, *Fab.*
C. sericea, *Say.* Abundant on blossoms of *Solidago* in August.

2. Fam. *Diaperidæ*, Stephens.

1. Diaperis, *Geoffr.*
   D. hydni, *Fabr.* Abundant in a species of *Boletus* on the Mountain in August and September.
2. Oplocephala, *Lap.*
   O. bicornis, *Oliv.* Abundant an a fungus on decaying stumps on the Mountain, August to October.
3. Bolitophagus, *Fabr.*
   B. cornutus, *Pz.* Abundant in *Boletus ignarius* on dead stumps on the Mountain, July.

3. Fam. *Tenebrionidæ*, Leach.

2. Tenebrio, *Linn.*
   T. molitor, *Linn.* Very common in old houses.
   T. tenebrioides, *Beauv.* Under bark of dead stumps on the Mountain.
2. Centronipus, *Dej.*
   C. calcaratus, *Fabr.* Under bark of dead stumps on the Mountain, October.
   C.? femoratus, *Fabr.* Common crawling on boarded paths, July and August.
3. Ipthinus, *Dej.*
   I. Pensylvanicus, *Geer.* Abundant under bark of dead trees, &c. on the Mountain and at St. Helen's Island.
4. Upis, *Fabr.*
   U. reticulatus, *Say.* Numerous under bark of dead trees on the Mountain and at Laprairie.

RYNCOPHORA.

1. Fam. *Bruchidæ*, Leach.

1. Cratoparis, *Dej.*
   C. lunatus, *Fabr.* Abundant in a fungus on stumps on the Mountain, August and September.

2. Fam. *Curculionidæ*, Leach.

1. Sitones, *Germ.*
   S. lepida, *Sch.* Abundant amongst grass.
2. Hylobius, *Germ.*
   H. pales, *Herbst.* Common, June.
3. Listroderes, *Sch.*
   L. (*not determined.*) One specimen taken flying, June 8th, 1857.
4. Balaninus, *Germ.*
   B. (*not determined.*) One specimen taken September 1856.
5. Cryptorhynchus, *Illiger.*
   C. luctuosus, *Sch.* Common on board-fences on the Mountain, May.
6. Conotrachelus, *Latr.*
   C. posticatus? *Sch.* By sweeping herbage on the Mountain, June.
7. Ceutorhynchus, *Schupp.*
   C. (*not named.*) Abundant in grass, June.
8. Sphenophorus, *Schonh.*
   S. (*not named.*) Common on sandy paths through fields, June and July.
9. Cossonus, *Clairv.*
   C. platalea, *Say.* Abundant under bark of dead stumps and trees on the Mountain.
10. Dryophthorus, *Schupp.*
    D. corticalis, *Say.* Under bark of stumps.

3. Fam. *Hylesinidæ*, Shuck.

1. Hylesinus, *Fabr.*
   H. aculeatus, *Say.* Taken by sweeping grass and in houses, July to October.

4. Fam. *Bostrichidæ*, Schaum.

1. Xylosterus, *Erichs.*
   X. (*not named.*) One specimen taken on a board-fence on the Mountain, May 1857.
2. Tomicus, *Latr.*
   T. pini, *Say.* Rare, in houses.

LONGICORNES.

I. *Prioni*, Lec.

(See Journ. Acad. Nat. Sci. Phila., Vol. II. second series, p. 107.)

I. Fam. *Prionidæ*, Leach.

1. Orthosoma, *Serv.*
   O. unicolor, *Drury.* Not uncommon; in decayed stumps, and flying by night, July, Montreal and Sorel.

II. *Cerambyci*, Lec.

1. Fam. *Lepturidæ*, Leach.

(See Journ. Acad. Nat. Sci. Phila., Vol. I. second series, p. 316.)

1. Desmocerus, *Serv.*
   D. palliatus, *Forst.* Rare, July.
2. Acmæops, *Say.*
   A. proteus, *Kirby.* Very abundant, June to August.
3. Evodinus, *Lec.*
   N. sp.? One specimen taken May 1859.
4. Typocerus, *Lec.*
   T. fugax, *Fabr.* Abundant on the heads of umbelliferous plants in orchards on the Mountain, July and August.
5. Leptura, *Linn.*
   L. Canadensis, *Fabr.* Abundant, July and August. Montreal and Sorel.

2. Fam. *Cerambycidæ*, Leach.

(See Journ. Acad. Nat. Sci. Phila., Vol. II. second series, p. 5.)

1. Elaphidion, *Serv.*
   E. parallelum, *Newm.* Rare, July.
2. Arhopalus, *Serv.*
   A. speciosus, *Say.* Not common. Larva in hard-maple trees.
   A. pictus, *Drury.* Very abundant on flowers of *Solidago*, September Larva on the locust-tree (*Robinia pseudacacia*), in gardens.
3. Clytus, *Fabr.*
   C. ruricola, *Oliv.* (hamatus, *Say.*) Rare, July.
   C. colonus, *Lec.* Common, July and August.
4. Physocnemum, *Hald.*
   P. ligneum, *Fabr.* Not uncommon, Montreal and Belœil Mountains, May.
5. Phymatodes, *Mulsant.*
   P. dimidiatus, *Kirby.* Very rare.
6. Callidium, *Fabr.*
   C. janthinum, *Dej.* (antennatum, *Newm.*) Common, May to July. Abundant at Sorel.
7. Criocephalus, *Mulsant.*
   C. agrestis, *Kirby.* Common. Abundant at Sorel, July.

(*To be continued.*)

MONTHLY METEOROLOGICAL REGISTER, ST. MARTINS, ISLE JESUS, CANADA EAST, (NINE MILES WEST OF MONTREAL,) FOR THE MONTH OF JUNE, 1859.

Latitude, 45 degrees 32 minutes North. Longitude, 73 degrees 36 minutes West. Height above the level of the Sea, 118 feet.

BY CHARLES SMALLWOOD, M.D., LL.D.

Day of Month.	Barometer, corrected and reduced to 32° F. (English inches.)			Temperature of the Air. F.			Tension of Aqueous Vapour.			Humidity of the Atmosphere.			Direction of Wind.			Mean Velocity in Miles per hour.			Amo'nt of Rain in inches.	Amo'nt of Snow in inches.	Weather, Clouds, Remarks, &c., &c. [A cloudy sky is represented by 10, a cloudless one by 0.]		
	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 a. m.	10 p. m.			6 a. m.	2 p. m.	10 p. m.
1	29.955	29.788	29.881	59.0	84.6	64.5	.439	.758	.497	.88	.66	.83	S. S. E.	S. by E.	S. W. by S.	0.11	3.61	3.72	.....	.....	Cu. Str. 10.	Clear.	Str. 3.
2	724	620	701	64 0	78.1	69.6	.440	.678	.496	.75	.73	.70	W. by S.	S. S. E.	W. S. W.	5.42	6.50	12.83	0·270	.....	Cirr. Str. 9.	Cu. Str. 8.	Clear.
3	715	681	330	55.7	78.0	49.7	.370	.443	.265	.84	.46	.75	S.	S. E. by E.	N. W.	5.48	5.02	17.88	Inapp.	.....	Clear.	" 6.	Str. 2.
4	929	942	970	41.9	48.1	45.0	.169	.218	.211	65	66	72	N. by E.	W. by S.	S. by W.	11.63	4.93	1.53	.....	.....	C. Str. 8.	C. C. Str. 8.	Clear.
5	900	875	930	41.8	58.0	51.0	.169	.255	.203	65	53	55	N. N. E.	S. by W.	W. by S.	12.98	6.31	4.03	.....	.....	Cirr. Str. 4.	" 3.	Cirr. Str. 4.
6	906	904	964	50.3	75.6	59.0	.283	.469	.275	78	57	56	S. W.	W. S. W.	S. W.	6.83	10.93	7.48	.....	.....	Clear.	Cirri 2.	Clear.
7	998	848	851	47.0	84.0	64.0	.278	.597	.446	85	53	77	W. by S.	W. S. W.	W. N. W.	2.63	1.81	3.82	.....	.....	Clear.	Clear.	C. C. Str. 9.
8	615	847	532	58.1	69.4	84.0	.400	.599	.328	84	85	77	S. by W.	W. by S.	W. N. W.	6.07	12.18	14.42	0·933	.....	C. C. Str. 10.	Rain, with thunder.	C. Str. 4.
9	759	696	742	42.1	62.9	52.0	.222	.455	.264	83	58	69	W. by N.	S. W. by W.	S. W.	18.63	8.80	4.11	.....	.....	Clear.	Cirri Str. 4.	Str. 2.
10	648	644	802	52.3	50.9	43.4	.328	.283	.121	83	73	48	W. by S.	W. S. W.	N. W.	1.86	6.09	10.42	0·263	.....	C. Str. 10.	Cirri Str. 8.	Clear.
11	920	981	30.097	40.2	53.2	43.0	.173	.194	.199	73	48	74	W. N. W.	W. N. W.	W. N. W.	8.37	14.42	5.21	.....	.....	Clear.	C. C. Str. 8.	Clear.
12	30.087	997	29.810	42.6	62.4	55.6	.206	.263	.288	78	48	65	S. S. W.	W. S. W.	W. by N.	0.00	4.43	7.98	.....	.....	Cirr. Cum. 6.	" 10.	C. C. Str. 6.
13	29.741	660	741	57.2	60.4	60.3	.350	.462	.487	75	91	94	S.	S. by W.	S.	13.60	8.47	3.00	0·273	.....	C. Str. 9.	Rain.	C. Str. 10.
14	896	760	810	52.2	69.5	89.2	.282	.430	.439	73	61	88	N. E.	S.	S. S. W.	10.01	1.81	0.22	.....	.....	" 9.	Cu. Str. 6.	Cirr. Cum. 4.
15	730	576	516	63.0	86.6	68.0	.478	.850	.642	83	68	92	S.	S. W. by S.	S. W.	0.03	3.53	12.20	1·330	.....	C. C. Str. 8.	C. C. Str. 10.	Rain.
16	601	672	789	67.2	58.2	57.8	.591	.426	.429	89	91	91	W. by S.	N. E. by E.	S. W.	5.83	5.15	1.46	0·990	.....	Cu. Str. 6.	Rain.	C. Str. 9.
17	819	901	852	50.0	68.7	58.2	.265	.261	.365	75	38	76	E. by N.	E. by N.	N. E.	3.89	2.47	2.80	.....	.....	Clear.	C. C. Str. 6.	" 10.
18	641	682	800	52.2	68.4	56.1	.361	.543	.385	93	79	84	N. E. by E.	S. W.	W. by S.	13.60	1.22	7.33	1.364	.....	Rain.	Cu. Str. 8.	Clear.
19	804	784	897	55.0	75.0	61.0	.308	.519	.390	74	60	74	W. S. W.	W. S. W.	W. S. W.	0.90	5.96	3.92	.....	.....	Clear.	Clear.	Clear.
20	874	776	710	51.0	75.2	60.2	.277	.686	.456	79	77	88	S. W.	S. W.	E. by S.	5.97	1.47	3.16	.....	.....		C. C. Str. 8.	C. Str. 10.
21	601	489	601	59.1	64.3	62.5	.476	.503	.491	97	86	88	S. S. W.	S. S. W.	S. S. W.	1.62	4.68	4.17	0·240	.....	Cu. Str. 10	Cu. Str. 8.	" 8.
22	592	612	800	57.0	68.6	61.0	.385	.509	.419	84	75	80	W. S. W.	W. S. W.	S. W. by W.	2.87	8.72	2.62	.....	.....	" 8.	" 9.	" 2.
23	897	890	984	61.4	83.0	66.3	.449	.664	.542	85	62	87	S. W. by W.	S. S. W.	S. by W.	0.80	1.40	0.82	.....	.....	Clear.	Cirr. 4.	Clear.
24	993	914	931	61.0	66.3	61.0	.456	.452	.480	88	87	81	S. E.	S. E.	S. by E.	0.06	0.92	0.12	0.230	.....	Cu. Str. 10.	Cu. Str. 10. [der.	C. Str. 10.
25	769	702	766	58.1	75.8	61.7	.452	.628	.436	91	73	80	N. N. E.	W. S. W.	W.	0.00	2.03	4.48	Inapp.	.....	" 10.	" 6. Thun-	Clear.
26	860	814	918	65 3	83.4	69.0	.526	.687	.502	84	56	72	S. W.	W. S. W.	W. S. W.	1.22	2.15	4.61	.....	.....	Clear.	Cirr. 2.	Clear.
27	954	840	774	57.0	89.6	73.0	.378	.855	.552	81	62	70	S. W. by S.	S. by W.	S. by W.	1.47	3.96	8.01	.....	.....	"	Cu. Str. 4.	Str. 2.
28	778	736	817	75.0	84.5	77.0	.751	.746	.758	88	64	82	W. N. W.	N. W.	S. W. by W.	14.26	10.05	2.97	0·210	.....	Cumulus 10.	C. C. Str. 4.	Str. 2.
29	575	426	530	79.0	89.0	70.9	.372	.764	.695	78	56	95	W. S. W.	S. W. by W.	N. W. by N.	3.67	13.85	10.93	Inapp.	.....	C. C. Str. 3.	Rain thunder	Cu. Str. 10.
30	677	714	886	50 0	68.0	57.8	.260	.319	.322	82	47	69	W.	W.	W.	14.40	28.34	0.67	0.176	.....	Cu. Str. 10.	Clear.	Clear.

REPORT FOR THE MONTH OF JULY, 1859.

	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.	6 a. m.	2 p. m.	10 p. m.			6 a. m.	2. p. m.	10 p. m.
1	29.821	29.830	29.762	59.0	74.3	61.0	352	.396	419	.70	.48	.80	W. S. W.	W. S. W.	W. S. W.	2.23	8.41	5.50	.....	.....	Clear.	Clear.	Clear.
2	524	463	320	67.2	81.8	72.2	.591	.773	675	.89	.71	.88	S. S. W.	S. S. W.	W. S. W.	1.47	5.74	15.32	Inapp.	.....	Cu. Str. 10.	C. C. Str. 10.	Cirri 3.
3	586	700	895	85.4	62.4	50.1	.259	.234	.228	.68	.51	.64	N. by W.	N. by W.	N. N. E.	12.22	7.60	4.22	.....	.....	" 6.	" 6.	Clear.
4	30.041	30.115	30.134	49.0	68.7	54.3	.212	.319	.165	60	47	49	N. N. E.	S. S. E.	S. S. W.	6.93	3.52	0.43	.....	.....	Clear.	Clear.	Clear.
5	204	175	292	45.4	80.2	61.0	.269	.599	.419	88	59	80	S. S. W.	S. by W.	S. by W.	0.00	0.00	0.30	.....	.....	"	"	Str. 2.
6	134	125	038	64.2	85.0	67.2	.464	.650	463	77	54	71	S. S. W.	S. S. W.	S. S. W.	0.08	2.03	0.21	.....	.....			Clear.
7	047	29.959	29.980	65.0	76.7	67.5	471	.577	.522	81	64	79	S. S. W.	S. W.	S. W.	1.82	2.42	0.42	.....	.....	C. C. Str. 8.	C. Str. 10.	C. C. Str. 4.
8	29.948	896	914	64.3	82.2	66.3	529	572	.536	89	52	84	S. W.	W. by S.	W. by S.	0.00	0.92	1.60	.....	.....	" 9.	Cir. Cum. 4.	Cirri 2.
9	30.012	30.003	30 035	64.5	81.1	67.0	.396	.547	463	68	52	71	E.	N. N. E.	S. S. E.	2.93	2.55	0.72	.....	.....	Clear.	Cirri 2.	Clear.
10	046	009	29 992	70.1	85.5	72 0	.632	570	.385	73	47	53	S. S. W.	S. by E.	S. S. E.	0.43	2.03	4.65	.....	.....	Light Cirri.	C. C. Str. 6.	C. C. Str. 8.
11	29.851	29 762	869	64.6	9.00	78.9	.427	751	.785	71	53	82	S. by W.	S. S. W.	S. S. W.	1.78	7.77	0.81	.....	.....	Clear.	Cu. Str. 8.	Cu. Str. 8. Aurora Borealis.
12	838	757	783	74.0	95.6	84.0	681	915	789	81	56	68	S. S. W.	S. S. W.	S. by E.	0.00	1.60	4.70	.....	.....	"	Clear.	Str. 4. Lightning.
13	880	962	979	70.9	85.0	67.0	.551	.746	.496	75	64	77	N. N. E.	E. by S.	E. S. E.	9.82	6.73	1.70	0.100	.....	Cu. Str. 8.	"	Clear.
14	957	996	998	68.1	82.0	65.2	509	432	483	75	40	78	E. S. E.	N. E. by E.	E.	1.22	3.82	1.00	.....	.....	C. C. Str. 4.	"	C. C. Str. 6.
15	999	774	966	68.9	79.0	66.3	.536	.651	579	77	66	89	N. E. by E.	S. E.	S. E.	1.10	4.56	10.05	Inapp.	.....	Cir. Str. 4.	Cu. Str. 10.	Cu. Str. 8.
16	719	710	728	65.9	87.0	70.1	.529	670	.628	78	53	88	S. E. by S.	S. S. E.	S. by W.	6.02	14.22	0.98	.....	.....	Cu Str. 10.	C. C. Str. 6. [der.	" 10.
17	783	757	899	70.1	77.1	71.4	.556	.639	.886	84	69	80	S. W.	S. S. W.	E.	1.10	3.13	0.41	0.110	.....	Clear.	Cu. Str. 6. Thun-	Clear.
18	699	586	594	67.9	80.9	68.2	.563	638	584	87	62	87	E. by S.	S. S. E.	S. E. by E.	1.31	0.71	00.0	.....	.....	"	Cu. Cir. 8.	Cu. Str. 8.
19	689	480	396	67.9	92.1	77.0	.563	.814	.685	87	54	75	E. by S.	S. S. E.	S. S. W.	0.66	0.18	1.53	.....	.....	"	Cirr. 6.	" 9. Thunder.
20	398	493	683	65.0	67.0	52.1	820	.425	.534	88	64	86	N. W.	N. by W.	W. by N.	5.46	16.02	13.00	0.170	.....	Cu. Str. 10.	C. C. Str. 4.	Clear.
21	677	595	663	60.0	75.6	64.1	.360	.484	.464	68	56	77	W. S. W.	W.	W. S. W.	9.56	9.80	7.32	.....	.....	Clear.	Cu. Str. 6.	Cu. Str. 8.
22	467	328	432	63.0	63.0	57.2	.485	491	.378	86	88	83	S. S. E.	W. by S.	N. W. by W.	1.11	0.36	3 48	0.218	.....	Cu. Str. 8.	" 8.	Rain, thunder.
23	560	554	674	86.4	89.4	80.1	.321	.529	.238	74	75	78	N. N. W.	W.	W.	7.79	0.55	2.36	0·050	.....	Clear.	" 4.	Clear.
24	719	747	794	48.4	76.1	62.2	.285	470	.406	85	52	74	W.	W. S. W.	S. W. by S.	10.00	14.57	5.46	.....	.....		" 4.	Str. 2.
25	794	669	747	60.6	79.9	57.0	.456	.465	.497	88	47	87	S. S. E.	S.	S. by E.	0.00	2.07	5.81	.....	.....	C. C. Str. 8.	" 6.	Clear.
26	634	524	578	60.0	62.3	53.8	469	.549	.374	94	97	93	E. S. E.	S. E.	W. S. W.	0.11	0.33	7.03	1.780	.....	Fog.	Rain.	Cu. Str. 10.
27	477	474	597	52.2	65.1	58.8	.324	.420	.446	86	68	91	W. by S.	N. N. W.	W. by N.	4.86	8.95	14.57	Inapp.	.....	C. C. Str. 8.	Cu. Str. 10. [der.	Clear.
28	634	620	794	63.2	73.9	57.8	.478	510	.436	83	63	94	W. by S.	W. S. W.	S. W.	3.75	5.00	5.56	.....	.....	" 8.	" 4. Thun-	Str. 2.
29	902	829	939	60.8	80.6	63.5	.505	.599	.536	95	59	92	S. W.	S. S. W.	S. S. W.	0.15	0.75	0.40	.....	.....	Cir Str. 4.	" 8.	Clear. Aurora Borealis.
30	962	905	892	64.7	87.0	68.9	.523	.557	.458	86	45	79	S. S. W.	S.	S. E. by E.	0.17	0.26	0.28	.....	.....	Clear.	Clear.	" "
31	872	858	791	62.1	90.0	69.1	.489	.889	.564	91	42	79	E. S. E.	S. E. by E.	E. S. E.	0.00	0.22	1.67	.....	.....	Cirr. 2.	"	" "

REMARKS FOR JUNE, 1859.

Barometer: Highest, the [illegible], 30·097 inches. Lowest, " 29th " 29·426 " Monthly Mean, 29·784 inches. Monthly Range, 0·671 "

Thermometer: Highest, the 27th day, 91°0. Lowest, the 12th day, —31°1. Monthly Mean, 62°00. Monthly Range, 59°9.

Greatest intensity of the Sun's rays, 101°4.
Lowest point of terrestrial radiation, 24°2.
Mean of humidity, .706.
Amount of evaporation, 2.89 inches.

Rain fell on 14 days, amounting to 6.779 inches; it was raining 48 hours 30 minutes, and was accompanied by thunder on 5 days.
Most prevalent wind, the W.
Least prevalent wind, E. by S.
Most windy day, the 30th day; mean miles per hour, 14.84.
Least windy day, the 24th day; mean miles per hour, 0·38.
Aurora Borealis visible on 0 nights.
The Electrical state of the atmosphere has indicated high tension.
Ozone was present in rather large quantity.
Solar Halo on the 12th day.
Frost on the 5th, 6th, 11th and 12th day.

REMARKS FOR JULY, 1859.

Barometer: Highest, the 5th day, 30·292 inches. Lowest, " 22nd " 29·332 " Monthly Mean, 29.815 inches. Monthly Range, 0·864 "

Thermometer: Highest, the 12th day, 97°7. Lowest, " 4th " 36°1. Monthly Mean, 67°58. Monthly Range, 61°6.

Greatest intensity of the Sun's rays, 110°1.
Lowest point of terrestrial radiation, 27°3.
Mean of humidity, .705.
Amount of evaporation, 3.61 inches.

Rain fell on 9 days, amounting to 2.428 inches; it was raining 15 hours 35 minutes, and was accompanied by thunder on 7 days.
Most prevalent wind, S. W.
Least prevalent wind, E.
Most windy day, the 24th day; mean miles per hour, 11·34.
Least windy day, the 5th day, mean miles per hour, 0·61.
Aurora Borealis visible on 2 nights.
Parhelia on the 9th day.
Frost on the 4th and 5th days.
The Electrical state of the atmosphere has indicated high tension.
Ozone was present in moderate quantity.