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MONTHLY.

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A. J. PINEO, WOLFVILLE, N.S.

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A. J. PINEO,
Wellsville, N.S.

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NOTES ON THE MAYFLOWER OF THE LOYALISTS.

*Read before the Natural History
Society by Mr. G.F. Mathew.*

It has been suggested that the delicate and modest little flower which we call the Mayflower should be adopted as the emblem of the Loyalists, because it is in full bloom at the season of the year when they landed on these rocky shores. In this connection it may not be out of place to inquire as to the use of the word 'Mayflower' or 'May blossom' in the past; and specially to ask what was the *Mayflower of the Loyalists?* Was their Mayflower identical with our spring favorite; or was it some other plant, to us unknown; or if known, called by some other name?

Our Mayflower has been named by botanists *Epigaea repens*, or the plant that *creeps on the ground*—a name very appropriate to its habit of growth as it forms patches of foliage, branching and spreading on the ground from a centre root. The flowers are found at and near the ends of the branches, and are almost concealed from view by the thick leathery, shining, dark-green, round-oval leaves. The Mayflower delights in a rocky and not too fertile soil. When it grows in richer

land it is apt to be choked by the surrounding plants better adapted to such situations; and in very shady places it will not blossom. It craves a well mulched surface with gravelly, or rather stony soil beneath, and seems to enjoy itself most where granite and traprocks, or quartz rocks prevail. On and around reefs or ledges of such rock, on the border of the forest, the Mayflower spreads its refreshing green, and perfumes the air with its delicate fragrance. It is as wild by nature, and as hard to tame as the savage that once roamed master of the wilderness where it still abounds; hence many attempts to cultivate it have failed, or it is easily killed by kindness or injudicious care. The Mayflower belongs to the great family of the Heaths and its nearest allies in this country are the Bearberry†, Spicy Wintergreen‡ and Tea berry*. They, like the Mayflower, have evergreen leaves, and differ in this respect from most of the American Heaths.

The barren and gravelly soils of many tracts in North Eastern North America, and its moist climate are particularly well suited to the Mayflower, and it flourishes here in abundance. Warned by the experience of many seasons on the Atlantic coast, it does not open its petals when the spring rains first remove the snow,

†Arctostaphylos. ‡Gaultheria. *Chimaphila

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but awaits the advent of warm weather from *our* Mayflower in preferring a knowing full well that the warm days rich and moist soil, and its stem is soft of early spring are deceptive; and that and succulent like its ally the Purslane (*Portulaca*); while the stem of the chilling winds from the Gulf of Saint Lawrence and the snow-clad *our* Mayflower is strong and woody, hills of Labrador, will, later on, chill and its leaves thick and hard.

the air and interfere with the development of its tiny tubular blossoms, protected though they are by enveloping scales and sepals without, and by a fluff of woolly hairs within. On Lake Superior and the inland region generally the Mayflower has greater confidence in the sun's power, and as soon as the snow is gone, confidently opens its petals to the vernal breeze.

The family to which the lady belonged, who spoke of the Spring Beauty as the true Mayflower, came from Connecticut; and it is easy to see why our Mayflower was not theirs. In the region where they had lived, before removing to St. John, the *Epigæa* would blossom in April and the term "Mayflower" would be inappropriate to it; hence some other blossom would with them have borne the name of "Mayflower." The name and the associations connected with it were dear to those New England colonists; with what object more attractive could they have associated the ideas and the name, then the delicate Spring Beauty—a plant which abounds in the rich woods covering the mountains and hills of Western New England and New York. To the Loyalists of Connecticut, therefore, the word "Mayflower" carried a different meaning from that which it bears with us.

But the purpose of these remarks is not so much to describe the mayflower and its habits as to enquire whether this flower of ours was the Mayflower of the Loyalists. The writer was very much surprised, many years ago, on being told by an old lady who came here with the Loyalists, that our plant (*Epigæa repens*) was *not* the Mayflower. Among wild flowers that were afterwards shown to her she at once recognized one as the true Mayflower. This was the plant which is now called the Spring Beauty (*Claytonia Caroliniana*), a delicate little plant with two opposite leaves, which are not unlike an Indian's canoe-paddle in shape, and having a cluster of nodding pink flowers between the leaves. The short stem which the Spring Beauty annually sends up comes from a little brown tuber, buried deep in the rich mould of the hardwood forest. The plant differs

And to the Loyalists of New York and New Jersey, where the *Epigæa* was known as the Trailing Arbutus, the idea of "Mayflower," as applied to this plant, was equally foreign. Their name for our Mayflower, however, was not happily chosen, as the Arbutus was one of those European L-ath-plants, which casts its leaves in

the autumn, and in this resembles that the Mayflower for which the such American heath-plants as the ship of the Pilgrim Fathers was Leather-leaf (*Cassandra*) and the named was not the "Mayflower" of Lambkill (*Rhodora*). These cover the Loyalists, any more than the the "barrens" with foliage and flower plant so designated by the latter is in June and July, but are bare and the Mayflower of the Maritime brown in the winter. As the term Canadians, for neither the *Epigæa* "Trailing Arbutus" was used in the (*repens*) nor the Spring Beauty were the Middle States for the *Epigæa* within known to Europeans before the discovery of America. They are both there, it was probably current in their natives of this continent and are unknown in the old. The Mayflower of the time as well. Whether the Spring Beauty was their Mayflower or not, the Pilgrims must, therefore have been it is sufficiently clear that the *Epigæa* some other plant—perhaps the Hawthorn (*Crataegus Oxycantha*), which was not.

But to go one step further back in the history of the "Mayflower," Washington Irving, in his "Nickerbocker's History of New York," describes in a very amusing way the helplessness of the Dutch Governors of New York in their attempt to oppose the colonizing tendencies of the New Englanders. He described the encroachment of the Yankees upon the territory of their Dutch neighbors on the northern shore of Long Island Sound, and they even swarmed over into Long Island, displacing the Dutch or occupying the country in advance of them. These Puritan farmers carried with them the tradition that their ancestors came over from England in the "Mayflower." Many of them settled in Connecticut, and their descendants formed the bulk of the emigrants from that State whom we know under the name of Loyalists. It is quite clear, however,

appears to be alluded to, by Mickle in the following lines:—

"By this stream and the *May blossomed* thorn
That first heard his love tale and his vows."

And by Spencer in the following:

"To gather *May basket* and smelling breer
And home they haste the postes to dight."

And in Chaucer there is the following line:

"And fresher than the *May* with flowers newe"

The Hawthorn still bears in England the name of "The May," and there can be little doubt that its fragrant blossoms suggested the name borne by the pioneer ship of the Plymouth colony.

As the location of the Sacred Mount—the point of dispersion of a primitive people—was transferred to the migrating Indo-European nations from one country to another, in the Old World; so the Saxon emigrants transferred the name of "Mayflower" to a new species of plant, as they lost their familiarity with the old. To us, living in a region where *Epigæa*

abounds, and blossoms in May, it very appropriately bears the name of Mayflower, not only on account of its beauty and its fragrant flowers, but because it blooms in the spring. It is rightly chosen by the descendants of the Loyalists as a fitting emblem of those who, on this day 100 years ago, first set foot on the shores of New Brunswick. Its home is in that region of the North American continent which extends from the Atlantic coast of Nova Scotia, through New Brunswick and Maine, to Eastern Ontario, Lake Superior and the rocky wilds of the North West. In Ontario and the Maritime Provinces of Canada is the home of the Loyalists, and when the first detachment of these people landed on the rocky shores of St. John harbor, in the spring of 1783, there can be no doubt that they found the Mayflower (*Epigaea*) blooming around them. In its leaves, fresh and green from beneath the winter snows, they would have seen an emblem of their own preservation through adversity in the past; and in its modest and fragrant blossoms an omen of content and prosperity in the future.

In conclusion it may be added that our reflections upon the Mayflower lead to the following result:—

The Mayflower of the Pilgrims was not the Mayflower of all the Loyalists.

The Mayflower of the Loyalists was not the Mayflower of the Maritime Canadians.

The Mayflower of certain of the Loyalists was the Spring Beauty.

The Mayflower of the Maritime Canadians may very fittingly be dedicated to the Loyalists.

Or, to consider the matter from a chronological standpoint, it may be said that 260 years ago the Hawthorn was the Mayflower. 100 years ago the Spring Beauty was to some Loyalists the Mayflower.

Now the *Epigaea* is to the descendants of the Loyalists, the Mayflower.

SAINT JOHN, N. B., May 13, 1883.

Botanical Department.

AMONG THE CRYPTOGAMS.

BY Prof. A. H. MCKAY,

PAPER V.—USES OF LICHENS, (*Continued.*)

“Little Lichen only clinging
In the wild wood to the tree;
Covering all unseemly places,
Hiding all thy tender graces,
Ever dwelling in the shade,
Never seeing sunny glade.”

In addition to its geological functions the lichen subserves other purposes, and notable among these are its uses as

FOOD AND FODDER.

Many of them contain a large amount of a starch-like substance called *Lichenine* and *Inuline*. The latter is found in the roots of some flowering plants, the

Dahlia for instance. *Lichenine* is intermediate between *Starch* and *Dextrine*—British Gum. Various species yield a kind of gum, similar in properties to Gum Arabic. The "Iceland Moss," which can be found in any of our drug stores, and which comes from Iceland, the cold mountains of Scotland and Ireland, and is even found in boreal parts of Canada, is a good example of an edible lichen. When fresh it has some medical properties which make it not very agreeable food; but by drying and by a simple chemical operation these properties are easily got rid of. The Icelanders make a jelly-like pudding of it with boiled milk, whey and soup. Puorst found one pound of the lichen *Cetraria Islandica* sufficient to convert into a tremulous jelly, on cooling, eight pounds of soup. It is also used in broth as our ordinary vegetables are here. They also reduce it to powder, and preserve it for winter use, as we do flour or meal, and use it for bread, porridge or gruel. They also collect large quantities of it for their cattle. So important do they find it in their system of domestic economy that they declare with a fervent gratitude that "a bountiful providence sends them bread out of the very stones." Sir John Franklin and his companions found some use in it in their Arctic explorations, although many can scarcely eat it even at the point of starvation on account of the properties above alluded to. The *Cladonia*

rangiferina or Reindeer moss, which is found abundantly in Nova Scotia every one knows to be one of the principal kinds of fodder which support the lives of the invaluable reindeer in northern countries.

"The wiry moss that whitens all the hill," as Crabbe calls it, covers vast tracts of country in Lapland where it grows from six to twelve inches in height. On a journey Parry says that four pounds is the daily allowance for each reindeer in the absence of the growing plant. Cattle have been fed on it sometimes mixed with straw having hot water and salt poured over it, with the result, it is said, of producing delicious milk and butter while their flesh becomes fat and sweet. It is sometimes mixed with flour, after being reduced to powder; or it is boiled in milk or broth as the "Iceland Moss." Clarke in his travels, mentions having eaten it and even speaks of it in a commendatory way. Another rock lichen which has been found to be very useful in Arctic regions for sustaining human life belongs to the genus *Umbilicaria*, which is well represented on the rocks of Halifax County and elsewhere in this province. It is called "Tripe de roche" or Rock Tripe. This black leathery looking substance is often boiled and eaten by the Canadian hunter when pressed with hunger. In polar voyages this food growing on the bleak rocks has many a time saved whole crews from perishing by starvation. The nutritive qualities of the

umbilicarias depend on the large amount of starchy matter in their composition. They have, as the *Cetraria Islandica*, however, a bitter principle possessed of purgative properties. But perhaps the most singular of all are the *Lecanora esculenta* and *L. affinis* which frequently, under extraordinary circumstances, have served as food for large numbers of men and cattle in various countries from Tartary in Asia to Algeria in Africa. Large tracts of country in the above mentioned places repeatedly appeared to be covered suddenly with a layer sometimes from three to six inches thick. The inhabitants believing it to have come from heaven called it a kind of manna and imitated their flock in time of scarcity by eating it. Some writers have supposed that the manna of the Israelites consisted of one or other of these lichens. Several "rains of manna" of this genus have been described as occurring in Persia and in neighboring countries. It is usually found in the form of small lumps, from the size of a pin's head to that of a pea or small nut, greenish or whitish in color, hard, irregular in form, without odor and tasteless. They appear to have no base of attachment, consequently they are supposed to grow by deriving the whole of their nourishment from the air, and probably may have grown while falling to the ground.

This lichen manna has fallen as 'rain' or has been found suddenly covering tracts of country in Persia, the steppes of Tartary, the country

about the Altai and Caucasus, near Sebastopol and other parts of the Crimea, on Ararat, near Damascus, in Algeria and in the African Sahara. In 1829, during a war between Russia and Persia, a large portion of country around a town on the southwest shore of the Caspian was covered by a shower of this manna-rain while the inhabitants were reduced to famine. The sheep were noticed to eat it greedily. The idea immediately occurred to the starving inhabitants, who soon found that it could be converted into agreeable and nutritious bread.

If we want to test the value of a lichen as an article of food, we can do so quite simply. The amount of starch or mucilage in its composition is an approximate measure of this value. Take a certain amount of clean thallus, powder it, or cut it up into small pieces place it in a vessel with hot water, keep it hot for some time, varying both heat and duration, to discover the best conditions for the experiment. On allowing this liquid to cool, it gelatinizes more or less firmly according to the amount of gelatinous substance in the specimen. The *Pulmonaria Sticta* has a considerable amount of this material in its large and easily collected fronds, and may when properly cooked form an agreeable article of diet. This starchy mucilaginous material was applied some years ago by the ingenious Lord Dundonald to calico-printing with very good success.

PRACTICAL ENTOMOLOGY.

PAPER V.—CLASSIFICATION OF INSECTS.

LOWER SERIES—Body usually flattened; prothorax large and squarish; mouth parts usually adapted for biting; metamorphosis often incomplete, pupa often active; larva flattened, often resembling the adult—*Thysanura Neuroptera, Orthoptera, Hemiptera, Coleoptera.*

HIGHER SERIES—Body usually cylindrical; prothorax small; mouth parts formed for sucking; larva usually cylindrical, very unlike the adult—*Diptera, Lepidoptera, Hymenoptera.*

	LOWER SERIES			
	Wingless. No Metamorphic changes.	THYSANURA	{	Lepismatidæ—Bristle-tails Poduridæ—Spring-tails. Libellula—Darning needles
<i>Non-suctorial. 4 wings</i>		NEUROPTERA	{	Ephemera—May Flies Phryganea—Caddis Flies Corydalus—(horned great mandibles Termes—White Ants
Large equal wings; transparent.			{	Gryllus—Crickets Locusta—Locusts
Front pair slightly thickened narrow end overlapping; hind pair broad and folded.		ORTHOPTERA	{	Acrydium—Grasshoppers Phasma—Walking-ticks Blatta—Cockroaches
			{	Cimex—Bed bug Pediculus—Louse Coreus—Squash bug
<i>Wingless and 4-winged.</i>		HEMIPTERA	{	Notanecta—Water boatman Gicada—17 yearl oucst Coccus—Cochineal Aphis—Plant ouse
Suctorial. Legs slender.			{	Cicindela—Tiger beetles Carabus—Ground “ Dytiscus—Diving “ Silpha—Carrion “
			{	Scarabæidæ—Goliath beetle Elater—Snapping “
Non-suctorial. Front wings horny, closing with a sharp edge.		COLEOPTERA	{	Pyrophorus—Lightening bug Coccinella—Lady bugs Cyrambycidæ—Long-horned beetle
			{	Curculionidæ—Weevils Culex—Musquito Cecidomyia—Hessian Flies
	HIGHER SERIES			
<i>Both suctorial and chewing.</i>				
	Two-winged.	DIPTERA	{	Tipula—Daddy-long-legs Pulex—Fleas Musca—House flies Cestrus—Bot flies
Four wings large and scaly. Legs not or active locomotion. Spiral proboscis or suction.		LEPIDOPTERA	{	Papilio—Butterflies Sphingidæ—Hawk Moths Noctua—Moths Apidæ—Bees Vespidæ—Wasps
			{	Formicidæ—Ants Cynipidæ—Gall-flies Tenthredinidæ—Saw-flies Urocneridæ—Horn-tail
Four wings, transparent. Mouth for sucking or biting.		HYMENOPTERA	{	

The connecting link between insects and the Myriapods, has lately been erected into a distinct order, (see Packard's Guide, 1883) the Thysanura. They are accordingly inserted with his classification.

The above list contains some of the principal genera of each order, but must not be considered as in any degree complete—DR. J. E. WHITE

Astronomical Department.

THE STARS.

BY PROF. A. E. COLDWELL.

PAPER II. THE CONSTELLATIONS.

Lyra—the Harp.
Aquila—the Eagle.
Delphinus—the Dolphin.
Cygnus—the Swan.

These four constellations are adjacent and can be seen in the Eastern heavens during July and August.

If the student will scan the eastern sky carefully during these months he will see three stars in a straight line about $5\frac{1}{2}$ degrees in length. The middle star is much brighter than the others. This is *Altair* or Alpha Aquilæ, a star of the 1st magnitude. The one below or S.S.E. is Beta Aquilæ or *Alshain*, the one above or N.N.W. is Gamma Aquilæ or *Tarazed*. These three are the principal stars in the Eagle and are sufficiently conspicuous to be easily found.

On the left of this group or N. E. about 13 degrees distant is a beautiful little cluster which contains 4 stars of the 3d magnitude so arranged as to form the outline of a diamond. This is sometimes called *Job's Coffin* but it is known to Astronomers as the Dolphin. There are in this constellation fourteen other stars of smaller magnitudes,

If a line through the three stars in

the Eagle be continued towards the zenith about 35 degrees it will pass through one of the most brilliant stars in the northern hemisphere, conspicuous both for its brilliancy and for its being removed from other stars of the 1st magnitude. This is *Vega* or Alpha Lyrae situated in the Harp. This Constellation contains 21 stars including one of the 1st magnitude two of the 3d and two of the 4th. The most noted are *Vega* computed to be 400,000 times as distant as our Sun and Epsilon Lyrae only $1\frac{1}{2}$ degrees N.E. of *Vega*. This small star with another of the same (5th magnitude) makes with *Vega* a beautiful little triangle which can be easily made out on a clear night. A small field-glass will resolve Epsilon Lyrae into a double star and a large telescope resolves each of these components into binary systems. This apparently insignificant star of the 5th magnitude is really a splendid multiple star containing twin systems moving around a common centre of gravity and each of the components around each other. The period for the individual system is estimated at 2,000 years that for the whole system about its common centre 1,000,000 years.

Directly east or on the left of Lyra about 15 degrees distant is a remarkable group of stars forming the outline of a large cross, the longer or upright

piece lying along the milky way from N.E. to S.W. about 20 degrees, the cross piece consisting of three stars at right angles to the other line and about 18 degrees in length. This cross represents The Swan, the upright piece being the body and beak and the cross-piece the wings. This constellation contains eighty-one stars, including one of the 2nd magnitude, six of the 3rd and twelve of the 4th. Alpha Cygni is called *Aried* or *Deneb*; it is on the left or east end of the upright and the brightest star in the constellation. Beta Cygni or Albireo is on the extreme right, in the beak of the swan or foot of the cross. It is not conspicuous being only of the 3rd magnitude but is a beautiful object in the telescope being resolved into two brilliant stars of blue and yellow, contrasting finely.

A very inconspicuous star in this constellation, 61 cygni, is in one respect the most noted in the northern hemisphere. Its parallax has been measured or it is found to make an angle with the diameter of the earth's orbit of 34 seconds. From this angle we get its distance, 412,000 times the diameter of the earth's orbit. Light which comes from the sun in 8 minutes would come from this star in $7\frac{1}{2}$ years.

51 cygni is the nearest star in the northern heavens and, with the exception of Alpha centauri, the nearest one known.

Herpetology.

CANDISONA EDWARDSII

A NEW CANADIAN RATTLESNAKE.

Read before the Natural history society of Toronto.

As there are specimens of *Candisona Tergeminus* in your collection, I have sent this to you for exhibition,

as being at least to me, new for a Canadian variety; and, if you place the two side by side, you will at once see the marked difference there is between them. I assure you I am not at all satisfied with a description given in Baird and Girard. In fact, at the present moment, there is no hand book of the North American reptilia, and the student has to do the best he can, to identify anything at all. It is useless for one to say anything, or to make disparaging remarks, but with the exception of Jordan's Manual, which is little better than a dry list, there is absolutely nothing that we have, that is the least reliable. Messrs Baird and Girard took a very great deal of honest pains, and did their best, with such alcoholic specimens as they had, but I certainly refuse alcoholic specimens, as test specimens, and they are so different from the living that a most minute and scientific description of an alcoholic specimen is but a burlesque and a travesty if compared with the living reptile.

But to return to the subject of the *Candisona Edwardsii*. I had heard from a young man, living in the northern portion of the County of Bruce, that he had lots of rattlesnakes in his vicinity, and he afterwards, at my request, sent me a few. They were the common *Crotalophorus Tergeminus* of B. & G., the prairie rattlesnake, or true massasauga, and I have had them alive for some time, but I have not had as yet, an opportunity to make any satisfactory experiments

with their poison. Last September I got the one before you, along with two others, and we will now describe the reptile on hand, and compare it with that of Baird and Girard.

CANADIAN SPECIMEN. BAIRD & GIRARD.

1 Twenty-five rows of dorsalscales. 1 Twenty-three rows of dorsals.

2 First and second lateral rows smooth. 2 First and second lateral rows smooth.

3 Vertical plates subpentagonal, tapering posteriorly. 3 Precisely the same as mine in every particular.

4 Lateral rows of blotches seem to merge making sometimes on y one larger, one smaller or occasionally only one spot. 4 Lateral rows of blotches proportionally very small.

5 Ground color, yellowish brown, with three lateral series of blotches, the upper one, small and obscure, and the inferiors, frequently coalescing, so as to make on y one series of lateral spots, all chestnut brown. 5 Ground color yellowish brown with three lateral series of deep chestnut blotches.

6 Two elongated brown blotches extending from the supra ciliary s, backwards. 6 Precisely as in view, and I give B & G's words.

7 A band of Chestnut-brown from posterior frontal plates, passes over the eyes, to the neck, and under it, a yellow stripe extends from the nostril to the angle of the mouth. 7 This is B & G copied directly down and is most perfectly correct as regards the specimen now before you all.

And thus the descriptions agree. But the one great point of difference, between *Crotalophorus Tergeminus* and *C. Edwardsii*, is the color of the abdomen, and this you cannot help seeing, if you look at all. The description of B & G is "the belly of a light straw color, dotted and sprinkled irregularly with brown. This holds with my specimen in every particular except the sprinkling with brown and yet there is now and then an isolated little dot. If you examine the two external rows of the dorsals, you will

find it perfectly true, that they are smooth to the vent. After that I think you will find only one external scale, smooth on the tail; at least such is in my notes. If you place the bottle on its side, and get the reflection of the light on the two rows of scales, next the abdominal scutæ, you will see how smooth they are, and no keel running down their center. You can see this at once, if you get the side raised out of the alcohol in the bottle, as the bottle lies horizontally. Now if any of you take the extra trouble of comparing this *Candisona Edwardsii* with the description of *C. Tergemina*, I think you will find ample consanguinity, and a close resemblance so thoroughly marked as to emphatically consider them one species, and mere varieties, and very trivial ones at that. Mr. Jordan never mentions it at all, and it is not reported as a northern form. Baird and Girard give us three specimens and they are all snakelets, and all southern, not one of them even half adult. There is one fault that I find with the descriptions of these eminent herpetologists, as regards the *Crotalus* family, namely, they never on any occasion give a list of the number of the rattles on each specimen nor state whether by mishap, they may not have been broken off. It is seldom indeed that we see a series of rattlesnakes without many of the specimens being thus mutilated.

I will now give you what is termed the form, of these four specimens and conclude with a few comparisons and

remarks. I place them so, that any one can compare them at a glance.

Abdominal plates or scutæ.	Sub. caudal Scutellæ	No. of dorsal scales.	Total length of body & tail	Length of tail only.
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Specimen No. 1.
134 | 2x2x6 rat. | 25 | 27 in. | 13 in.
Captured at Stokes Bay, Ontario, September 1883, by Richard Bradley.

Specimen No. 2.
143 | 23x3 | 23 | 17½ in. | 2½ in.
From Tamalipas New Mexico, captured by Dr. Edwards.

Specimen No. 3.
153 | 24 | 23 | 11 in. | 13 in.
South bank of Rio Grand; captured by General Churchill.

Specimen No. 4.
145 | 26 | 23 | 8½ in. | 1½ in.
Sonora; by Col. J.D. Graham.

You will observe, that the specimen I have the pleasure of exhibiting, is in length twenty-seven inches, of a larger size than the massasauga in general, an adult, and a healthy male. Now you will remark the largest on which Mr. Baird and Mr. Girard form their "*species*." Let me ask you, is this reason able? There is the difference in the number of abdominal scutæ, which is less in mine, but I have many other specimens, with several more rising to 141. The subcaudal scutellæ agree in number, as I have another massasauga before me with 30, and the white-bellied specimen in your hands has two at the vent, divided, and twenty-two entire. In this, all agree. There are twenty-five rows of scales on the dorsum of mine and twenty-three on that of each of the snakelets, and I have a small specimen of a little, *C. Tergemina*, with twenty-three rows on the back. Now there is nothing

in this number of rows on the back, as you see distinctly from my statements, to necessarily form a species. There is nothing in the specimen to warrant me, or any one, in separating it from *Tergemina*, and it thoroughly unites in itself all the peculiarities of both these "*species*." In the young of many snakes a row of the back scales or several rows are added as they grow older. I know from specimens in my possession, that this is a fact in regard to *Pituophis Bellona*. One very large specimen I have is 71 inches long, and has 37 rows of dorsals, and another, about 26½ inches, has only 29. Now these are glaring facts, and I do not think I am wrong in my prior statement in regard to old specimens developing sometimes a row or two more than the young. The *Pituophis Bellona* is the same as the *Sordo*, or rat-snake of Texas. Those of you who have read the descriptions of our American cousins, see the terms "*Gastrosteges*," for the scutæ and "*Urostiges*" for the Scutellæ. This is a new importation, and for my own part I see no use in them and therefore never use them, and do not intend to do so. I think the sensible, and easily understood nomenclature of Linne, is ample for all scientific and descriptive purposes.—Dr. John H. Garner.

Our Canadian Birds.

BY ERNEST E. T. SETON.

PAPER II.

I will now give a few simple directions for skinning and preserving birds. Having done so

we shall have completed the technical and closet part of the study and shall be left free in the future for field work.

The instruments and materials required for taxidermy are as follows: A sharp skinning knife, pair of scissors, forceps, a stout hook fastened by a string to the table before you, needle and thread, glass eyes, soft iron wire, wire pliers and file, cotton wool, fine tow, plaster of paris and arsenical soap; also a rule, preferably one graded on the metrical system.

For myself personally, when on an expedition, the only instrument I use is a pair of small stout scissors; these better than anything else answer all purposes.

Having shot your bird with fine shot, and plugged the mouth, nostrils and shot holes with cotton, you first make measurements, at least noting down the length from the tip of the beak to the end of the tail, and write this on a label to which you add the date, sex color of feet, contents of gizzard, etc. and any other remarks that you may deem necessary. The absence of this label detracts from the value of the specimen 75 per cent as a general rule and in some cases as much as 99 per cent.

Now before beginning to skin the bird it would be well to restop the mouth and vent, using a plug of cotton which has been saturated with plaster of Paris.

First make a slit in the skin from the rear end of the breast bone to the

vent taking care to cut nothing but the outer skin. Having made the slit it is well to powder the place with plaster of Paris and from first to last keep the body covered with the plaster as far as the flesh is exposed. This is the only way in which you avoid soiling the feathers.

From the slit you skin round until you find the legs, which you sever at the knees, leaving them hanging by the skin; in like manner you sever the tail from the back. The hook referred to is now stuck through the part of the back that is skinned and answers admirably as a third hand. Skin upwards till you come to the wings which cut off next the body. You never push never pull the skin off the neck by turning it inside out, when you get as far as the ears you may find it necessary to use the knife to free the skin from the skull. The eyelids must be carefully severed, and the skin is left hanging by the back of the head. Clear the skull (which is always left attached to the brain) from all fleshy matter and take out the brains and eyes; then paint it over with the soap and having fixed the eyes with cotton and formed a neck of the same material (this latter attached to a ball which has been thrust into the skull), restop the head and neck to their original position.

The legs you then skin, clear from flesh, paint with soap, wrap with cotton wool and replace. In like manner the

wings, but tie the ends of them loosely together so that they shall lie as far apart as in nature. by means of cotton wound all over the specimen. The eyes you insert from the outside.

You now clean the stump of the bird paint it as well as the whole internal surface, with the arsenical soap; rub it moderately with cotton wool gently, close the opening first made, and lay the bird in position to dry on a bed of cotton. This is what is called a "skin." The mistakes you will be most likely to make are making the neck too thick and not tying the wings closely enough. A beginner need not be surprised if two or three skins slip by ere his first skin is laid dry to dry. An expert can make from ten to eight skins per hour. Such is a very brief account of the mode of stuffing birds. Four success in the preservation you obtain in the skin; Your success in stuffing will be in the degree of your artistic appreciation of the form and actions of the bird. But in both cases long practice is necessary to render you skilful and quick. Some eminent authorities recommend that the entire skin be soaked for a minute or two in an alcoholic solution of corrosive sublimate and agitated until dry. This will rescue it from attacks of insects.

Stuffing is a more advanced art. Having made the skin, you must with tow and string make a hard body of the same shape as that you took out. A sharp pointed wire is clinched in this, so that a long piece projects at the upper place or the neck; this is then worked up into the neck and through the shell left projecting. A sharp piece is here worked up through the lig from the sole of each foot and the body where they also are clinched. The wings and tail are each furnished with a similar wire, all being driven into the hard tow body. You now pack the model with tow until you have the neck and body of natural size and shape. Then stitch up the slit first made and give the bird an attitude you please by bending the wires and compressing the body with the hands while drying, the feathers are kept in place. For a skin use cotton wool as it offers an admirably adapted mean between plasticity and elasticity, but as cotton wool is quite impenetrable by a wire or pin, you must substitute tow in stuffing.

Though the word "skinning" is used throughout you must not expect to use the knife as in skinning an ox; the birds skin is rather pushed off and nails are more used than the knife excepting when you sever the limbs.

In conclusion I must remark that though a brief instruction in stuffing is here given it is advisable and usual for the beginner to make a great many skins before he proceeds to set up any for exhibition.

In the next number we will proceed to take up the *natural* history of our Birds and it may safely be promised

that the next paper will be more interesting than this, for now that we pilgrims are safely past at least the biggest of the lions we may begin to enjoy the pleasures of the Palace Beautiful.

THE Terns in Nova Scotia.

[FROM "OUR BIRDS IN THEIR HAUNTS,"
BY J. H. LANGILLE.]

Outside of Mahone Bay on the south shore of Nova Scotia, are several islands of interest in respect to Ornithology. Flat Island, near Tancook is a grand resort for several species of Terns. It comprises about a hundred acres, is clear of trees, and, as its name implies, is comparatively level. Ledges of slate crop out here and there, however, forming low ridges with marshy patches intervening. As one approaches the rocky shores, large numbers of Terns are seen scouring the surface of the water for food. Of all the birds of our northern seas, these are the most elegant and graceful. Mackerel Gulls, the fishermen call them, but, though nearly related, they are no Gulls at all. Bearing a resemblance in almost every point to these larger and more bulky birds they are of a more slender and delicate mould. Small and light-bodied fork-tailed, with slender, pointed bill, long, pointed wings, and small, webbed feet, they are the very ideal of a swimming bird of flight. In no respect are they, but

air which delight to sport on the surface of the waters. The soft silvery grey of the upper parts harmonize finely with the sea and sky; the lighter tint or white of the under parts is pure as the snowy crests of foam, while the crowns of glossy black, and the bills and feet of coral-red are points of bright and pleasing contrast. What a powerful leverage in that ethereal element, the air, have those long pointed wings, raising the light body several inches at every stroke, and serving it as a well trimmed sail before the wind. How light this bird drops upon the water for its food of tiny fishes, too light and airy to dive out of sight, and often carrying its prey like a toy for some time, as if it fished for sport rather than from hunger. Occasionally a group of Terns will play together with a little fish, one seizing it in the air as another drops it and so passing it from bill to bill apparently for the mere sport of catching it. As the Tern flies low over the water, its downward pointing bill moving this way and that, it seems to be fishing in earnest; and again it gyrates high in the air, light, agile and airy as a swallow, and so suggests the propriety of one of its names—the Sea Swallow.

It is on their breeding grounds, however, that the Terns may be studied to the best advantage. As one lands on Flat Island, the air in every direction seems alive with them. They rise beyond gun-shot, the great mass interjecting their snowy circles

against the sky and the aggregate of their hoarse *ter-r-r-r-r-r*, *ter-r-r-r-r*, becoming almost deafening. As one approaches the resting places, which are here and there all over the island, some will drop down and hover noisily only a few yards above one's head. There it is that the pure underparts, the gracefully spread tail, the bright eyes, and the bills and feet of bright carmine, appear to the best advantage. In all their varying attitudes, this moving cloud of lithe and elegant creatures is a most pleasing and animating sight.

In this dense, moving mass, the species far the most numerous is the Arctic Tern (*Sterna macrura*.) Length 14.00—17.00; extent, 28.00—30.00; tail, 5.00—8.00; bill, 1.20—1.40; *tarsus*, 50—.67; this kind is a little more bulky than the Wilson. It is also generally distinguishable by its darker underparts and its bill of clear carmine, but is invariably so by its short *tarsus*,—only a half inch or a little more. In winter, and during the second summers the forepart of the crown is white, as also in the young of the year in its mottled plumage of grey and brown and which was once called the Portland Tern. The young have the bill and feet black and the underparts white even into the second summer. Habitat, Europe Asia Africa, North America generally south to the Middle States, and on the Pacific to California. Breeds from Massachusetts northward.

Next in numbers but few in com-

parison with the former, as is also the case in all the breeding places of the Terns visited on the coast of the province is Wilson's or the Common Tern, (*Sterna hirtundo*) Length, some 14.00; extent about 30.00; *tarsus*, .66—.87, and so notice ably larger than that of the Arctic. Except in the points noted, the two species are very similar, even to the voice. In habitat, however, the Wilson belongs to the whole Atlantic coast, breeding more or less throughout its range. In New England it breeds the most commonly of all its family. The black cap is retained during the winter, but is more or less imperfect in the young, which are beautifully mottled with grey and light brown, with more or less dusky on the wing-coverts and tail. As in the young of the former, the underparts are white, but the base of the bill and the feet are yellowish. I found this species breeding in large numbers on one of the Western Islands in Georgian Bay, and a few laying their eggs on the muskrat-houses on St. Clair Flats. I think they breed in the higher regions of the Great Lakes generally.

Among the flocks of the Terns on Flat Island, I was not a little surprised to find a few of the Roseate Terns (*Sterna paradisæa*). From what I had learned in the books I should have scarcely expected to find this species as far north as Portland Maine. Even on the wing it was readily distinguishable from the rest of its kind. Some 12.00—16.00 in

length, and so a little less than Wilson's Tern, its tail is at least an inch longer, and its entire form is more slender and graceful, so much so as to be noticeable even at a distance.

Other Terns appear almost clumsy in comparison with it. The bill is black except, perhaps, a slight patch of orange at the base below; the silvery curtain above is lighter and more exquisitely delicate even than in the rest of the Terns, the black cap extends well down the nape, the feet are dark orange, and the underparts are white-tinted throughout, even including the tail coverts, with a delicate rose, the texture and the color of the plumage being such as scarcely to be rivalled by the most exquisite rose-tinted satin. The newly shot specimen is simply charming, but the brightness of the plumage is not retained after death. Indeed all the Terns seem to lose their highest beauty when cold, their extreme delicacy of color being consistent only with the warm glow of life. A bird is a highly specialized and beautiful object, especially the more chastely colored birds of the sea; but what on the whole Atlantic can equal the graceful form, bill and crown of ebony, back of burnished silver, hoary, dark-tipped wings and breast of blushing rose, of this Roseate Tern! The more gorgeous birds of the tropics compare with it, as the dahlia and the peony, with the rose and the water-nymph. In motion it is no less charming, its flight being peculiarly

airy and dashing, the slender pointed wings and long forked tail being the most graceful possible.

The note of this Tern always advised me of its presence. I could not make out the "he-w-it repeated at frequent intervals," but essentially the same ter-r-r-r, ter-r-r-r-r, as given by the other Terns, only on a lower key and in a rougher, hoarser tone, as if aspiring to a fine falsetto.

Muskegat Island, near Nantucket, seems to be the principal breeding place of this species.

I did not see Forster's Tern, (*Sterna forsteri*.) in Nova Scotia. New England ornithologists testify to its rarity on their coast. Its place of breeding is believed to be in the upper regions of the Great Lakes. Only a few nest, like the Wilson's Tern, on the muskrat houses of St. Clair Flats. Mr. Maynard informs me that they breed in large numbers on Cobb's Island off the coast of Virginia. About the size and form of Wilson's Tern, this species seem to be the counterpart of that, the underparts being pure white instead of drab and the tail silvery instead of white, the outer vanes of the long outer feathers white and the inner darker than the rest of the tail. In winter plumage it is distinguishable from the disappearing of the black crown except a black stripe on each side of the head. Its note is similar to that of the Common Tern but noticeably on a lower key.

The nesting of the four species of Terns above given is quite similar,

and under certain circumstances quite variable.

Commonly the nest is a depression in the ground with a slight arrangement of dried grasses. If the nest is in the grass, it may be quite well built up; if on the shore, it may be only a slight hollow in the sand; or, fine pebbles or bits of slate may be circularly arranged after the manner of the Killdeer; or the egg or eggs may be laid directly on the green-sward. The complete number of eggs is most commonly two, often one, sometimes three. About 1.74x1.13 and regularly ovate, they are some shade of light green or light brown, variously speckled, spotted, and blotched with dark brown and neutral, the markings predominating at the larger end.

In some breeding places near the southwest end of the province I could identify none but the Arctic Terns, and so could feel very well assured that I was examining nothing but Arctic Tern's nests. But where several of the above species of Terns breed in community, I do not see how the eggs and nests can be specifically determined—their similarity is so great, and the birds invariably leave the nests before one comes near them. From eggs well identified, I should think that possibly the ground color of the eggs of the Arctic tends rather to green, and that of the Wilson to brown. More than that I could not affirm as to any appreciable difference in the eggs of these two species.

Stomach-Washing for Dyspepsia.

THE practice of treating patients suffering from chronic dyspepsia which resists the influence of regulated diet and of drugs, by washing out the stomach, which originated some years ago in Vienna, forms the subject of a paper by Dr. W. B. Platt, in the *Marland Medical Reporter*. We are here informed that cases most intractable to all other treatments have quickly yielded to this means. The principle underlying the treatment is to keep the stomach clean, and, so far as is possible, at rest, for a time sufficient to allow of its complete recovery. The operation should be performed in the morning, before breakfast. A soft, red rubber tube is passed gently down into the stomach quite to the pylorus; with this is connected about a yard of common flexible tubing and a glass funnel, which is held on a level with the patient's breast, and tepid water is poured slowly into the funnel, until a sensation of fulness is experienced; the funnel is then depressed to the level of the waist, and the fluid allowed to syphon out. The process is repeated until the water returns quite clear. The washing should be repeated every day for a week or ten days, and during that time the diet should be restricted to milk or a little meat; then the washing may be done every second or third day, and finally abandoned at the end of three weeks. The advantages claimed for this method are that it is efficacious, simple, and safe, and it certainly is worth a trial in intractable cases of chronic dyspepsia,—a disease which makes its victims a burden to themselves and their friends, and hitherto has brought but little credit to physicians.

Making Lead Pencils.

With the improved machinery now used, ten hands will make about four thousand lead pencils of the cheaper grade, a day. The cedar comes chiefly from Florida, and it is received in slabs of pencil length, one for the lead to go in and the other to cover it, as may be seen by examining the end of any lead pencil. Four little grooves are sawed in the thicker slabs, for the leads, which are kept in hot glue and taken one by one and inserted in the grooves. Then the thin slab is glued to the leaded slab, and thus united, they are run through a molding machine, four pencils coming from each slab. After the ends are rasped they are run between grooved wheels at considerable pressure for the only finish they get. This burnishes them, and they are tied in dozens and boxed for sale, mostly in plain wood, and of three degrees of hardness. The graphite used comes in a fine black powder, and is mixed with German white clay, about half and half, and then ground with moisture, forming a paste. This is pressed in dies into lengths of four leads, which are cut and then baked at a very high temperature. These sell at 85 cents, \$1.50 and \$2 a gross, and are very good articles, writing smoothly and evenly. The manufacturer makes about one hundred per cent., selling the pencils at eighty-five cents a gross, and the retailer makes a good thing selling them at a cent a piece. The graphite costs twenty-five cents a pound, and the clay little more than the freight. The more clay is used in the leads the harder they will be. The cedar is cut mostly from fallen trees in Florida swamps.—*Geyer's (N. Y.) Stationer.*

Clay Books.

Far away beyond the plains of Mes-

opotamia, on the banks of the river Tigris lie the ruins of the ancient city of Nineveh. Not long since huge mounds of earth and stone marked the place where the palaces and walls of the proud capital of the great Assyrian empire stood. The spade, first of the Frenchman, then of the Englishman, has cleared all the earth away, and laid bare all that remains of the old streets and palaces where the princes of Assyria walked and lived. The gods they worshipped and the books they read have all been revealed to the sight of a wondering world. The most curious of all the curious things preserved in this wonderful manner are the clay books of Nineveh. The chief library of Nineveh was contained in the palace of Konyunjik. The clay books which it contains are composed of sets of tablets covered with very small writing. The tablets are oblong in shape, and when several of them are used for one book, the first word of the tablet following was written at the end of the one preceding it. The writing on the tablets was, of course, done when the clay was soft, and then it was baked to harden it. Then each table or book was numbered, and assigned to a place in the library with a corresponding number, so that the librarian could readily find it, just as our own librarians of to day number the books we read. Among these books are to be found collections of hymns (to the gods), descriptions of animals and birds, stones and vegetables, as well as history, travels, etc. The Assyrians and Babylonians were great students of astronomy. The method of telling time by the sun, and of marking it by the instrument called a sun-dial, was invented by the latter nation. None of our modern clocks and watches can be compared to the sun-dial in accuracy.

—*Industrial News.*

POMPEII.

POMPEII is unquestionably the most interesting relic of the old Roman world now in existence; and the excavations steadily carried on by the Italian Government are continually adding to its attractions for the student of history and archæology. The destruction of the city eighteen centuries ago was really its preservation for our own age. If it had not been entombed by the Vesuvian ashes in the height of its prosperity and magnificence, it would doubtless have gone the way of the other provincial cities of ancient Italy, leaving, at best, a few fragmentary ruins for modern inspection.

A recent letter from Pompeii to the *American Architect* says:—

One thing is difficult to conceive without seeing it, and that is the gorgeousness of the interiors of the private houses. The colors are now faded; the columns are broken; the mosaics of the floors are generally nearly destroyed; the fountains do not play; the flower-beds are destitute of flowers: yet, even as it is, one is continually amazed by the brilliant effect of the interior vistas. In one house the view from a triclinium across two courts, both surrounded by gaily-decorated Corinthian columns standing before walls painted from top to bottom in a variety of colors, is really dazing to the eyes. The old Pompeians lived in a rainbow atmosphere.

Another striking thing is the absolute cleanliness. You may say that the dirt has all been taken away by the Italian Government. That is true; but it is quite evident, that, in the old times, it never was there. Our modern houses are not made to be clean, as were the Pompeian residences. The walls, the floors, every corner of their homes, were finished with the most admirable workmanship. In their rooms no plaster ever fell; for it was of such excellent material, and so well put on, that it soon became like marble. They had no wooden walls, no cracks where dust could penetrate. Water for cleansing was found in every part of the house and ran off through perfect drains. All the tables and bedsteads were of marble or bronze; even the well

curbs and the borders of the flower-beds were of hewn stone. Hygiene must have come naturally to the old Pompeian. He evidently had no chance to get a typhoidal attack. The only class of diseases he could not provide against were the eruptive, and one of these carried him off at last.

We remember being struck at Pompeii with the extensive *plumbing* in the baths and private dwellings, and also in the streets and public squares. The pipes and fixtures looked so modern and so new, that at first we supposed they had been put in recently; but we soon saw that they were too frequent for any purposes connected with the care of the place; and we recalled the fact (to which so many passages in the Latin writers refer directly and indirectly) that the old Romans were adepts in the plumber's art. With their aqueducts and fountains and baths, it could not be otherwise. There are few places except Pompeii, however, where any remnants of the *metallic* portions of this extensive system of water-distribution have survived to our day.

It must be remembered, as has been intimated above, that Pompeii, with its grand public buildings, its splendid private mansions, and the immense amount of art treasures that it contained, was only a small provincial city, after all. What, then, must Rome have been, with its metropolitan grandeur and magnificence, eighteen hundred years ago? — *Popular Science News*.

All common things, each day's events,
That with the hour begin and end,
Our pleasures and our discontents,
Are rounds by which we may ascend.
—H. W. Longfellow.

Mens' works, even in their most perfect form, always have more or less of excitement in them. God's works are calm and peaceful, both in nature and in His word

NOVA SCOTIAN GEOLOGY.

PAPER II.

BY REV. D. HONEYMAN, D.C.L., F.R.S.C.

Geological Notes.

SYNONYMS.

- 1 *Primitive.*
- 2 *Azoic.*
- 3 *Primary.*
- 4 *Laurentian and Huronian.*
Logan.
- 5 *Eozoic. Dawson.*
- 6 *Archaean. Dana.*
- 7 *Pre-Cambrian. Selwyn.*

The rocks of the Earth's crust which have been at one time or other designated by the above names, are the oldest of which we have any knowledge. When they were called Primitive and Primary in reference to formation, they were at the same time called "Azoic" or lifeless, being considered destitute of animal remains. The term Primitive is now obsolete or antiquated. Primary and Azoic are still in use. To portions of these rocks the terms Laurentian and Huronian have been applied. The former of these is to be found on the north side of the St. Lawrence, in Labrador, Prince Ruperts Land, at Quebec on the north of the O. M. C. O. Railway between Montreal and Ottawa, at Kingston and onward. The latter occur around Lake Huron. The term "Eozoic" is by some substituted for the term "Azoic." Those who use this term believe that they exhibit the "dawn of life" in the form of the *Eozoon*, dawn-animal, e. g. *Eozoon Canadense* of Dawson.

While eminent Zoologists and Palaeontologists believe, in the *Eozoon* others equally distinguished are unbelievers and still others are undecided. Hence the two terms are still applied to the same rocks. In like manner all are not agreed in reference to the use of Laurentian and Huronian. Dana has applied the term "Archaean" by way of compromise. This is derived from the Greek word *arche* the beginning. This may be used to signify either the Laurentian or Huronian, or both. It may be substituted for "Eozoic" or it may imply "Azoic".

The term "Pre-Cambrian" is now used in the Geological survey of Canada, as equivalent to Laurentian and Huronian, and Archaean is substituted for Eozoic, (Vide Reports of Progress 1881-2-3.) In the United States, in England, and in Nova Scotia the term "Archaean" has been adopted to designate the oldest rocks and that whether they be regarded as Azoic or Eozoic.

ARCHAEAN IN NOVA SCOTIA AND
CAPE BRETON.

Prior to 1867 the metamorphic argillites and quartzites of our gold fields were considered to be of Lower Silurian age and the oldest rocks in Nova Scotia and Cape Breton. The granites which were considered to be primitive rocks in olden time had come to be considered as igneous intrusive rocks of later uncertain or Devonian age. In 1868 I had the honor to initiate a change of views in

reference to the character and age of those rocks whose character and age were doubtful. It was then that I discovered the beautiful section of crystalline rocks, on the shore of Northumberland strait in the eastern part of Arisaig township, Antigonish County, which I identified with the Laurentian of Canada. Dr. Hunt agreed with me in considering the rocks to be of Laurentian age. Prof. Dana has given them the name Archaean in the last editions of his Geology.

TYPICAL SERIES.

1. As the Arisaig series was the first recognized, as it surpasses all others in fulness, as it is beautifully exposed on the shore and can be examined to advantage, and as it is the first to which the term adopted, Archaean, has been applied, we regard it as "typical."

2. In Cape Breton there is another series which is almost as good as the typical. This is situated at George's River, Boisdale, near the Little Bras d'Or. The characteristic rocks of this formation are very little different from those of the Arisaig series and some of them occur in much greater force. The series however is not well exposed as a whole and the variety is much inferior. I recognized this series in 1872 and described it in connection with the Arisaig series in transactions of the Institute of Natural Science 1872-3. The Boisdale series of Crystalline rocks, of which the George's River series is the representative part, has been described as "Laurentian" by the Geological Survey of Canada. Corresponding series are named "Pre-Cambrian" in the new nomenclature. We name them "Archaean."

About the same time that I recognized the Arisaig series as of Laurentian age, Prof. H. Y. Hind recog-

nized as of the same age certain other rocks of Cape Breton, as Laurentian gneisses, and he connected with these the granites associated with our gold bearing rocks. These are to be characterized as "Laurentian gneisses." These granites were regarded by the geologists of other times as *primary* Rocks (Abraham Gesner's "Remarks on the Geology and Mineralogy of Nova Scotia" 1836.)

I have been led by my own observations, to which I shall afterwards refer, to consider these views as substantially correct and to regard those granites as *metamorphic* rocks of "Archaean age."

3. A third series of great interest is that of the Cobequid mountains. The crystalline rocks which form their greater part, as well as the uncrystalline, with and without crystalline eruptive rocks, are beautifully exposed by the Intercolonial Railway. This work has done partly for these rocks what the sea has done for the Arisaig rocks. Since the construction of the Railway the sections have been considerably obscured by the erection of snow-sheds. Still they can be examined with advantage under subdued light. The rocks of the series can thus be examined *in situ*. There has been an extensive transportation of the rocks of the Cobequids as well as of the rocks of Blomidon already noticed. Boulders of these have been, by the action of agencies of the Glacial and Post-glacial periods, scattered broad cast over the counties of Hants, Halifax, Colchester and Pictou. A "boulder collection" can be readily made by examining the glacial drift which will contain specimens of all the crystalline rocks contained in the sections of the Railway, as well as of other rocks of the series which may be found in outcrops east

and west of the Railway or which undoubtedly exist in parts which are inaccessible or unexamined. The accumulations in and about Halifax Harbor, which I have already pointed out as containing amygdaloids are also remarkable on account of their Archaean boulders. A portion of the Archaean transportation which was proceeding in a South East direction toward the Atlantic coast has been diverted to a S. W. course and has thereby encountered the triassic amygdaloid transportation. The two united carried their joint freight onward, discharged it in the Atlantic, in Halifax Harbor and on either side of it and in Bedford Basin.

Illustration.—Dioryte with *magnetite* from the Cobequid Mountains has been found by Colonel Akers, R. E. and myself in the glacial deposit of Thrum-cap at the mouth of Halifax Harbor. Similar rock, a boulder with *magnetite* was, since then, brought to the museum, from the drift deposits of Rawdon, Hants County. The magnetite in both is "macroscopic," i.e. it can be seen with a pocket magnifying glass.

THE OXIDATION OF IRON.

In the northern and central portions of New Jersey, there are often found on the surface of the ground boulders of massive magnetite, of superior richness, which are entirely free from oxidation. A friend of mine, who has had a large experience as a mining expert, suggests that these boulders have been weathered many years; that in process of time they absorbed all the oxygen that they are capable of holding, and then oxidation ceased. I doubt whether this is an adequate explanation. Expose an iron kettle to the weather and oxidation at once

begins, and, if sufficient time be given, will go on uninterruptedly until the entire kettle is converted into an oxide. Why does not oxygen combine with the iron in the kettle up to the point of saturation, and then stop?

I have had in my cabinet, for some years, crystals of specular iron from Elba which I obtained very soon after they were mined, and which have never given the slightest indication of oxidation. The same can be said of magnetite crystals from Pennsylvania and from the Pencil mine in New York. Perhaps it will be urged that the reason for the absence of oxidation in these cases is the fact that the iron is in a crystalline state. If this is the true solution, why does not the non-crystalline specular iron from the Marquette region oxidize? I have had in my possession for years specimens of massive magnetite from the Allen Mines in New Jersey, which I obtained immediately after they were mined, taken from an adit more than two hundred feet in length, and which are as splendid and as free from oxidation to-day as when they first saw the light. Do not these facts prove that crystallization is not the clue to the mystery?

The best English steel will rust in India. But not so the Damascus blades which were in use eight centuries ago, and which are as lustrous now as when they were first fabricated. I have seen razors made by the late Mr. Crist of Jersey City, which it is said readily bring twenty five dollars each, which can be plunged in water and left to dry unwiped without rusting. But Mr. Crist's method of manipulation died with him.

Nature well understands how to prevent corrosion. Cannot some of our modern chemists wrest from her the secret? A princely fortune awaits

the man who will devise some inexpensive and effectual method, other and cheaper than galvanism, of protecting iron and steel from oxidation. This is one of the grand desiderata, which it is to be hoped the science of this age will supply. It seems strange that once and again the key to the problem has been in human hands only to be lost. What has been done surely may be done.

REV. A. DEAN.

The Panama Canal.

The London *Graphic*, of July 19, thus comments on this great engineering enterprise: If ever this channel of communication is completed, it will have, like the Suez water-way, far reaching consequences. The British public, however, do not show much interest in the affair, and therefore seekers after trustworthy information are driven to the official reports recently issued by the Government of the United States. From these documents we learn that, though the canal itself is scarcely begun, much useful preliminary work has been accomplished. Surveys have been made, the route has been cleared of trees and bushes, cottages and barracks have been built, and hospitals established. Admiral Cooper states that the undertaking is so gigantic that it is difficult to believe that it can be finished by the allotted time, 1888, but he admits that the work already done is of a solid and substantial character.

Recently there have been serious disturbances both at Panama and Aspinwall, chiefly between the native Columbians and the imported laborers, some 12,000 or 14,000 in number, from Jamaica. As these latter are, of course, British subjects, it is quite possible that our Government may be

drawn into some difficulty. Finally comes the question whether the canal, if finished, will prove a commercial success. It is reckoned to cost 120,000,000 dollars, and will probably cost a great deal more. Will the tolls which are levied on the ships which pass through be likely to yield a fair interest upon this enormous capital? That the Suez Canal was at first a failure and is now a success does not answer the question, because the circumstances of the two cases are not analogous. There is no region in the Western world to which the Panama Canal will be such a convenient short cut as the Suez Canal is to the countries of Southern Asia. To Australia the Panama Canal will merely afford an alternative route of doubtful advantage. Neither Mexico nor Peru raises much produce as compared with India or China; and the western coast of North America is already united with the eastern by several lines of railway. Altogether, the Panama Canal seems more likely to be useful to America than to the world in general.

Did men use aright their reason they would never deny an all-creating God. God is manifest in His works. He speaks to us from every flower, and plant and tree. His voice can be heard in the moaning of the waves, and His power can be read in the starry firmament. The sun proclaims His majesty, and the moon gives testimony to His might. The laws of nature, which are the foreseen and intended effect of forces created by Him, speak of His wisdom; and the seed time, and harvest time bear witness to His loving providence.

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A. J. PINEO, EDITOR,

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EDITORIAL NOTES.

A year and a half ago the MONTHLY began its career, under the name of the *Acadian Scientist*, as an eight-page publication. The exceedingly kind and hearty reception given to it by so many of the working naturalists, not only of Canada but of the United States, and a steadily increasing subscription list, have encouraged us to make enlargements from time to time, until the MONTHLY has arrived at its present respectable size, and numbers among its contributors many whose names are familiar throughout the scientific world. It seems, therefore, that our journal should receive the generous support of all Canadian Naturalists, and of those desiring to see established in Canada a national journal of the Natural Sciences.

While the Monthly is intended as a medium through which the working Naturalists of Canada may report progress, it is also designed that our columns shall be comparatively free from the dry technicalities that make

so much of scientific writing uninteresting to the general reader.

The MONTHLY aims to interest the young and lead them to see something attractive in the study of Nature. Hence the somewhat elementary character of some of our communications.

In the editorial management of the MONTHLY we have continually kept in mind the wants of the Public School Teacher. Many of this class have assured us of the benefit derived therefrom, and the pleasure and profit to themselves and those under their charge gained from their newly awakened interest in Natural History.

"Birds in Their Haunts," is the title of a book soon to appear from the pen of Rev. J. H. Langille, of Buffalo, N. Y. The work is to contain some 570 pages, illustrated by 25 cuts, and will give brief descriptions of the birds east of the Mississippi river. From advance sheets of this book we publish, in another column, some of the author's observations in Nova Scotia. Mr. Langille is a native of this province, and studied for some years at Acadia College in Wolfville.

Our September and following numbers will consist of 32 pages each.

Our correspondents will kindly send in mater for next number as early as possible.

Perhaps no matter of recent occurrence is of more universal interest than the successful attempt to rescue the Greely exploring party. Most of our readers are acquainted with the history of the expedition. In August of 1881 an exploring party of 25 men, consisting of chief officer Lieut. Greely,

under officers and privates, was set down at Discovery Harbor, in latitude about 81d. 45m., with rations supposed to be sufficient for three years. Fears being entertained in regard to their safety, two vessels, the Proteus and the Yantic, were, during the summer of 1883, dispatched in search of them, but the former being crushed in the ice the expedition had to be abandoned before any tidings were obtained of the Greely party. At the beginning of May last another expedition consisting of three ships, Thetis, Bear and Alert, left Newfoundland under the command of Capt. Schley. Sailing northerly, they, on the 22nd of June, reached Cape Sabine, near the 79th degree of latitude, and discovered the encampment of the survivors of the unfortunate party. Out of the original twenty-five men only seven were found alive, and these in a nearly exhausted condition. The others had perished by starvation; and had the relief come 24 hours later it is probable that none would have been found alive. Of the seven rescued one afterward died. The expedition reached St. Johns, Newfoundland, July 17th.

During the expedition the farthest point north yet reached was gained by Second Lieut. Lockwood, being in lat. 83 deg. 24 min., long. 44 deg. 5 min. This was named Lockwood Island. From an elevation was sighted Cape Robert Lincoln on the coast of Greenland, 11 minutes farther north.

PERSONAL.

Our enterprising botanical correspondent, G. U. Hay, of St. John, is off for a month's excursion into the wilderness of New Brunswick. On his return he will resume his interesting series of papers on "Fertilization of Flowers." Probably he will make some discoveries that will add to our knowledge of the botany of N. B.

Dr. White of Toronto, an enthusiastic director of the C. P. C., has for some time been suffering from an acute form of rheumatism, which has made labor of any kind almost an impossibility. He, too, is off for a few weeks, and will study Nature in her secluded haunts.

Dr. Garnier, of Lucknow, Ont., has been, during the greater part of the summer, enduring the horrors of a bronchial attack, but with his characteristic energy has not suspended work. He is studying the deglutition of serpents.

Dr. C. V. Riley, U. S. Entomologist, has gone to Europe for rest and special work connected with the U. S. Agricultural Department.

R. A. Proctor, the celebrated astronomer, has decided to become a citizen of the United States. He will reside in St. Joseph, Missouri.

"The works of God are fair for naught,
Unless our eyes, in seeing,
See hidden in the thing the thought
That animates its being."

News and Notes.

BOTANY.

BACTERIA OF WHOOPING-COUGH. — Dr. Karl Burger of Bonn claims to have discovered the bacterium of Whooping-Cough.

The *Sanitary Journal* for June says: "A child fed on one cow's milk recently died of tuberculosis, and the cow died a few months later of tubercular disease."

The disease producing *micrococci*, *bacteria*, and *bacilli*, are microscopic plants belonging to the great and varied class of *Algae*.

THE *Bacillus tuberculosis*, the organism producing tubercular consumption was exhibited under one of the most powerful microscopes at the Pictou Academy *Conversazione* on July 11th.

The *Illustrite Zeitung* states that the recommendations of the German cholera commission are being put in force at Hyderabad, especially with reference to the water supply; the reform being hastened by the Nizam having an attack of cholera.

The German Government has awarded 135,000 marks to Dr. Koch for his services on the International Cholera Commission.

HYDROPHOBIA. — Pasteur and his collaborators claim to have found an infallible protection against Hydrophobia in man or any animal. It is based on the inoculation of the hydrophobia poison after it has been modified by a process of cultivation in certain animals. This is analogous to the inoculation of the young heifer with smallpox, which is thus changed into vaccine disease, which in turn protects man against the original disease.

Ranunculus bulbosus Linn has been found in great abundance in the meadows about Shelburne by Mr. Jas Rossborough. This is the first station for it reported in Nova Scotia, although over twelve years ago Prof. Lawson, of Dalhousie College, directed some of his botanical students to look for it. It is common in the Eastern United States, and has been reported from localities near Barrie, London, and Hamilton, in Ontario.

Mr. Rossborough also makes another addition to the Nova Scotia flora in *Cytisus scoparius*, which he finds in the same locality

Tetrapogon pratensis still maintains its hold in the churchyard grounds of Prince Street church, Pictou, notwithstanding the energetic attempts made to eradicate and prevent its spreading.

The Oxygen Gas treatment for Asiatic cholera at Toulon has not fulfilled the expectations created by the reported success of its first trials.

A giant puff-ball (*Lycoperis n giganteum*) was found in Herkimer County, New York, in 1877, by Professor K. E. Call. It was irregularly oval in outline, and much flattened, instead of approaching the spherical form, as is common in the large puff-balls. Its largest diameter was *five feet four inches*, its smallest, *four feet six inches*, while its height was *but nine and a half inches*.

"Near Harrodsburg, Ky., U. S. A., May 20th, eighteen boys, after playing a game of base ball, started in search of wild parsnips, but got hold of the deadly Hemlock instead. The boys ate freely and were taken violently ill. Two of them died almost immediately. Five of them are not expected to live, and the others are suffering severely." The Cotton Hemlock is an umbelliferous plant, and is found throughout Canada.

The *Live Stock Journal* says: "When at Hanover Mr. Jenkins visited the new cattle market and slaughter-houses, where he found that every carcass was submitted to a microscopic examination by experts before being allowed to be sold. In one month, out of 637 head of cattle thus inspected, sixteen, or 2.5 per cent, proved to be more or less affected with tuberculosis or consumption, and were instantly condemned, the disease being held to be communicable to human beings through meat taken as food." How many of such cattle are used in Canada? That there are

come is well known. The *bacillus* of tuberculous is supposed to be communicable by the milk of the infected animal as well.

ZOOLOGY.

The Marine and Fishery Department of the Dominion is placing 200,000 salmon fry in the Nepisquit river.

Ben's Lake, near West River Station, I. C. R., Pictou Co., although only a few acres in extent, has a deposit containing a considerable amount of sponge spicules and diatoms.

Small siliceous birotules like those of the strobilists of *Meyenia fluviatilis* have been found in the deposits forming in the Garden of Eden Lake, Pictou Co. This makes the fifth species of fresh water sponges detected in Nova Scotia.

Several lakes in Maine have been successfully stocked with black bass, from fish taken from New York.

The Belgian Government has sent to the German Fisheries Department for two hundred and fifty thousand young trout, and fifty thousand young salmon, for the Belgian rivers, and intends to continue their cultivation.—*Science*.

Some material from Lake Ainslie, 12 feet depth of water, was found to contain peaty matter, sand, spicules of sponges and a few diatoms. Material from the bottom of the deepest portion of the lake would be extremely interesting. It would contain less peat and sand probably, with a larger proportion of siliceous organic remains.

In the winter of 1878-9 a million and a half of cod were successfully hatched at Gloucester, Mass., and placed in the clearer waters of the outer harbor. Great numbers of the young fish of this species have since been caught both in the outer and inner harbor, and the results have proved so satisfactory that an appropriation was obtained from Congress to build the extensive hatching-houses

and basins now in course of erection at Wood's Hall, Mass., U. S. A.

The Oyster industry of the United States last year employed 52,805 persons, yielding 24,195,370 bushels, worth \$30,438,852. That of France in 1881 employed 29,431 persons, producing oysters valued at \$3,464,565. Great Britain yielded a product worth from \$10,000,000 to \$20,000,000. Canada produced about \$130,000 worth.

The Oyster is one of the cheapest articles of diet in the United States to-day. In England an oyster is said to be worth as much as a new laid egg.

METEOROLOGY.

Saturday, 21st of June, was a squally day in Nova Scotia. Local thunder storms, sudden wind gusts and heavy hail storms pranced around the Province generally. In Halifax, Colchester, and Cumberland Counties much damage was reported from very large hailstones—in some places hundreds of panes of window glass being broken. We have seen no attempt at an accurate description of these hailstones. We therefore note an accurate description of hailstones which fell in Pictou on September 2d, 1879. The day turned suddenly so dark about an hour before midnight, that the gas in the Pictou Academy was ordered to be lighted. Shortly after, from the inky clouds, accompanied with lightning, thunder and wind, fell great hailstones. They were generally discoidal in shape. One measured one and a quarter inches in largest diameter, by three eighths of an inch thick, nearly as circular as a coin and weighing nearly 100 grains. As many as seven concentric rings of clear and opaque ice could be counted in these stones. In the most, at least three or four such rings, varying from 1-16 to 1-4 of an inch in thickness were observed. These stones appear then to have fallen through various strata of air, at one time accumulating clear transparent ice, and at another time

sleety or opaque ice. We have not noticed from our exchanges that such was the character of the pane-smashing hailstones of June last.

GEOGRAPHY.

Baron Nordenskjöld has discovered the eastern coast of Greenland to be separated by a narrow and shallow cold current from a warm current flowing from the south.

The average elevation of the National Park, in Wyoming territory, is about 7,000 feet above the sea, and it contains not less than twenty mountain peaks, ranging from 8,500 feet to nearly 11,000 feet high.

Edward Whymper states that the height of the glacier-clad interior of Greenland, in lat. 70 deg.—71 deg., considerably exceeds 10,000 feet. He describes it as presenting a high, level ridge, so absolutely covered by snow and ice that not a crag breaks the line. Many of the highest mountains are strewn with drifted rocks to their summits.—*American Naturalist*.

ORNITHOLOGY

The following resolutions were passed at the Ornithological Congress of Vienna: 1. The chase, capture, and trade of birds of passage and their eggs should be forbidden, during the second half of the winter and the spring; 2. All wholesale capture of Birds of passage, and trade in them, should be forbidden, except during the hunting season.—*Science*.

Dr. Karl Russ, of Berlin, received the highest honor diploma of the Congress, for his works on bird-keeping, canaries, parrots, and his Journal called the *Feathered World*.—*Science*.

On the 10th of June a concert was given by the students of the Pictou Academy to raise money for the work of the Ornithological

Club. \$106.50 were the gross receipts from the concert, and \$40 as donations in addition.

On the 11th July the Pictou Academy closed for its summer vacation with a grand *Conversazione*, at which one hundred and fifty dollars was raised for the mounting of Nova Scotia birds by the Ornithological Club. Eighty-seven birds, with a few of the smaller mammals, were exhibited as the work of the first four months of this club. Over 2000 specimens of insects, work of the Entomological Club, were exhibited in another room. An extensive collection of minerals and fossils and anthropological curiosities, etc., were exhibited in the museum, which has already become crowded. The Herbarium specimens in the library were not exposed for fear of injury.

The Art Department room was brilliant with native painting in oils on canvass, silks and plaques, water colors and crayon work. The general convocation hall contained refreshment tables, and no less than eight compound microscopes, a polariscope, kateidoscope, &c, all of which were in charge of students able to demonstrate. The Band of the Pictou Garrison Artillery was present in the evening. The proceedings closed by a display of fireworks from the grounds between nine and ten o'clock. Over four hundred were present on the first day. The building was opened on next morning, principally for school children and others, and the rush was not over until midday. The Pictou Academy Science Association is the most popular institution in Pictou.

Last week a wild goose was shot in Richmond Bay, Prince Edward Island, and sold to Benjamin Taunton. While the bird was being prepared for cooking, a large leaden bullet was found imbedded in its liver, completely encysted or covered with animal tissue, indicating that the bird had probably carried it for years. The bullet weighs an ounce, and was hammered round, and not cast, as is usually done.—*Pioneer, Summerside, P. E. I. May*

Under date of May 28th two interesting reports were received from Captain M. A. Healy of the United States revenue cutter Corwin describing a visit to the recently upheaved volcano in Behring sea at the northern end of Bogosloff Island

This volcano, which is in a state of constant and intense activity, was discovered in September, 1883, by Capt. Anderson, but no landing had been made upon it previous to the visit of the officers of the Corwin. It is described as a dull gray, irregular, cone-shaped hill, about 500 feet in height, from the sides and summit of which great volumes of vapor were arising. At the height of about two thirds the distance from the base to the apex of the cone, there issued a very regular series of large steam jets, which extended in a horizontal direction completely across the north-western face of the hill. Around these jets were seen upon nearer approach deposits of sulphur of various hues, which at a distance looked like patches of vegetation. The ascent was covered by a layer of ashes into which the climbers sank knee-deep. As the summit was neared the heat of these ashes became unbearable. On all sides of the cone were crevices from which issued steam with more or less energy, and in some instances at regular intervals like the exhaust of a steam engine. In some of these the temperature was estimated at 500 deg. F. The interior of the crater could not be seen on account of the vapor.

GENERAL.

A cremation society has been organized in Boston. The fee for membership is twelve dollars annually, and includes the right of the member to have his body cremated without further expense. The company intend to establish a crematory at the earliest opportunity, and a site has already been selected. This will be the sixth institution of the kind in the world.

A laboratory for bacterial research has been founded in the pathological institute of Mun-

ich, and the first course of lectures, founded on Dr. Koch's latest methods, has begun.

The British Association has invited the members of the American Association to join in the meeting at Montreal, and the American Association has in turn invited the members of the British Association, with their near relatives who may be with them, to take part in the Philadelphia meeting.

Platinum wire has been drawn down so fine by Mr. H. F. Read, of Brooklyn, as to be invisible to the naked eye, although its presence upon a perfectly white card could be detected by the touch, and could be seen with the aid of a small magnifying glass when the card was held in such a position that the wire cast a shadow. A number 18 platinum wire was placed in a tightly fitting, thin cylinder of silver, and drawn through until the cylinder "lost its grip;" the platinum was then drawn through another and another cylinder in the same manner, until the above fineness was acquired, and the silver was reduced to merely a coating. The wire was to be for cross wires in telescopes which require no strength.

According to *Nature*, several officers of the Russian navy have submitted to the minister, Admiral Shastakoff, a new scheme of a polar expedition. Recognising the extreme difficulty, if not absolute impossibility, of reaching the north pole by sea, these officers propose to start an expedition on sledges from the New Siberia islands, which are nine hundred miles distant from the pole. The sledgeparties will make depots of provisions at suitable intervals as they slowly but surely journey north, and thus secure a safe return. The scheme is to be submitted to the learned societies, and necessary funds raised by subscriptions.

The Albert medal of the Society of Arts has been awarded by the council of the society, with the approval of the Prince of Wales (the president), to Capt. James Buchanan Eads, "the American engineer whose works

have been of great service in improving the water communications of North America and have thereby rendered valuable aid to commerce.

Mackay's Lake, East River, St. Mary's, is very rich in organic siliceous remains.

At a meeting of the French Academy, March 31st, Brogniote announced the discovery, in the rich carboniferous deposits of Commeny, of new gigantic forms of insects, of the type of Dictyonera, in which the expanse of wing was nearly twenty-eight inches.

LITERARY NOTICES.

The August CENTURY, which is the "Midsummer Holiday number" is unusually fresh and attractive, even for that eminently popular magazine. It carries an odor of fields and flowers and an insidious suggestiveness of holiday rambles that make a pleasing loneliness in the hearts of those who are not dead to the attractions of nature.

The American Meteorological Journal for May and June have been received. This Journal is published at Detroit, Mich. by W. H. Burr & Co, at \$3.00 a year. It is the only American publication devoted exclusively to a subject that is attracting increased attention every year. The two numbers before us have been gotten up with a great deal of care and contain much valuable matter. We commend this journal to all interested in meteorological studies.

That enterprising monthly magazine *The Naturalist's World*, published at Ilkley England is about to present, with an early number, a series of facsimile autographs of eminent naturalists and scientific men of the day. Among the signatures the following will be especially noticeable:— SIR JOHN LUBBOCK, M. P., F. R. S., PROF. T. H. HUXLEY, F. R. S., RICHARD JEFFERIES, THE REV. J. G. WOOD,

M. A., F. L. S., DR. TAYLOR, F. L. S., Editor of *Science Gossip*, and many others.

The American NATURALIST for July has been received full as usual of original work and the latest Natural History discoveries. In its eighteen volumes the American Naturalist must contain an encyclopædia of the Natural Sciences especially of the American developments in them during the past eighteen years. We have in the one before us the description of a new infusorian by Alfred C. Stokes, the "Theory of sex and sexual Genesis," Hallingsworth, "On the evidence that the Earth's interior is solid" Wodsworth, "The Tertiary mammalia" E. D. Cope, "Vestiges of Glacial man in Minnesota" Miss Bobbit "Zoology in the National Park" Editor Among very many other interesting points we have under Geology the "Pacific Isles" In Geography "Extinct Mammalia of India" and in Microscopy, "Sections of Diatoms."

Exchange Department.

This department is for the use of subscribers whose notices will be inserted several times free. For non-subscribers the charge is five cents a line.

Mr. A. Delugin, pharmacien, Blois, Loir et Cher, France, desires North American coleoptera (genus *Donacia*). He offers in exchange numerous coleoptera from France; also a collection of the French *Donacia*.

Minerals, Foreign Stamps and Shells to exchange for Minerals. Correspondence solicited with advanced collectors only.

THOMAS S. ASH.

429 Rush St., Philadelphia, Pa.

E. J. SMITH, box 35, Natick, Mass., desires any of the following species of shells in exchange: *Neptuna Islandica*, *N. Decemcostata*, *Fasciolaria Ligata*, *Scalaria Groenlandica*, *Callista Connexa*, *Pecten Islandica*, *P. Tenuicostata*, *Chitons*, *Thracias*, or any Northern species not common in Mass.

CANADIAN POSTAL COLLEGE OF THE
NATURAL SCIENCES.

The increasing popularity of the College is exceedingly gratifying and encouraging to those whose labors are given to promote its usefulness. The willingness on the part of eminent scientific workers everywhere to co-operate with the directors in their laudable efforts to popularize the study of natural history is a sure indication that the C. P. C. has before it a useful future. Since our last report two such gentlemen have united with the Board and we expect also to be able to announce shortly the addition of several others. One of the new directors is Mr. G. U. Hay of St. John, N.B. who is associated with Mr. McKay in the work of the Botanical department. Mr. Hay is a most accomplished and diligent worker in his department, and has made some interesting discoveries while working up the botany of his native province. In the museum of Acadia College in this town is a valuable herbarium representing "Acadian Flora". This collection, which includes several thousands of specimens, is the gift of Mr. Hay, and was, with the exception of a few plants from the collection of his late brother-in-law, Prof Fred Hart, gathered and arranged by himself, Mr. Hay writes with a pleasing style and his papers promise to be interesting.

The other acquisition is in the person of Mr. F. R. Latchford, A. B. of Ottawa Ont., who takes the department of Conchology. Mr. Latchford is a member of the Ottawa naturalists' field club, and we should judge, a most energetic one. He has published a valuable paper on the *Unionidae* of his vicinity in which he

describes and figures one species new to science. Our readers may expect soon to see the beginning of his contributions to the MONTHLY. The full list of officers and directors with their departments, as at present, is as follows:

President, Professor A. E. Coldwell
A. M. Wolfville N. S.

Secretary, A. J. Pineo, A. B.
Wolfville, N. S.

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Several requests have come in for a list of the names of all the members. Such a list will probably be published at no distant date.

We hope that every member of the C. P. C. will see to enlarge its working membership and thus increase its usefulness.

We have a number of interesting communications that we should like to publish for the encouragement of

the friends of the C. P. C. We have at present room for only the following one but will endeavor to lay others before our readers soon. We publish this one now as it calls the attention of a particular class—the Ministry—to the good that they may derive from connection with the college, and suggests ways in which they may be otherwise helpful in the work.

The directors earnestly desire the cooperation of all who are interested in the objects of the College.

A. J. PINEO.

Secretary-Treasurer.

CORRESPONDENCE.

HIGH BRIDGE, N. J.

My Dear Mr. Pineo:—

The two latest instances of evolution that have come to my notice are the transformation of "The Acadian Science Club" into "The Canadian Postal College," and of "The Acadian Scientist" into "The Canadian Science Monthly." I have witnessed the change with unaffected delight. It occurs to me, however, that possibly you have not yet reached your *Ultima Thule* in the process of development. Ostensibly Canadian, you are large-hearted enough to embrace in your sympathies and plans your brethren this side the border. Why do you not adopt as your motto Sewall's familiar lines, slightly altered?

"No pent up Utica contracts our powers,
But the whole boundless continent is ours."
Your method of work seems to me an inspiration. I can conceive of no other so feasible way of reaching such large masses of youth, and of engaging them in the study of nature. The earth on which we dwell, the wonders with which it teems, the overhanging firmament, are all an open book, penned by the hand of the Supreme Architect, and are as truly worthy of reverent study as the Bible itself. For one, I have no fear of Science, but recognize her rather as the handmaid of Religion.

Nothing would please me more than to learn that my brethren in the ministry, in large numbers, were entering your college as students, and were earnestly using their influence in recommending it to their young friends in the secular walks of life. Clergymen are leaders of opinion, and their hearty co-operation in such an enterprise would be invaluable. I am no blind enemy of works

of the imagination, but I cannot fail to see that our youth are devoting more of their time to novel-reading than is for their good. Whip-syllabus is pleasant enough to the taste, but is too unsubstantial to serve as the main article of diet. Present gratification is not the great end of life. I think the gentlemen with whom you are associated have devised a most excellent plan for weaning the young men from an undue devotion to works of fiction, and for interesting them in a more profitable employment. Mere homilies on the enervating effect of excessive novel-reading will not bring about the desired result. The best way to drive out the darkness is to let in the light. Science has transcendent fascinations, and, give her a chance, she is sure to win her own way and conquer hearts. I trust my brethren of the cloth will see their opportunity, and use persistent and zealous effort to swell the numbers of your students, and give them every encouragement in doing faithful work.

Nor do I despair of seeing clergymen from twenty-five to fifty years of age taking your three years' curriculum of study. Why should they not give their odd hours to loving communion with nature? Nothing can be more delightful as a relaxation from the more serious business of their profession. Nothing would add more to their influence with the educated classes, especially the trained scientists. The objection is often made by naturalists that clergymen in general are not competent to feel the force of the arguments raised against the current theology from the standpoint of science. There ought no longer to be any ground for such a charge. The ministers of Christ should be armed at all points, and so prove themselves worthy of universal respect. Pres. Hitchcock commanded the homage of the men of his generation no less as a scientist than as a theologian, and none the less as a theologian because he was an accomplished scientist. Dr. McCook is doubtless no worse preacher than he would be had he never made an exhaustive study of the *Arachnida* and the *Formica*.

Be assured, my dear friend, of my hearty interest in your grand enterprise. I bid you and your fellow-workers God-speed. Go on as you have begun. Steer clear of a narrow provincialism. Add as you may be able to your facilities, and enlarge your scope; and ultimately, at no distant day, may your college stand confessed the leading school of Science for the masses in the Americas.

Sincerely yours,

A. DEAN

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