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No. 3.

1884.

March.



THE  
**Canadian Science**  
 MONTHLY.

DEVOTED TO THE INTERESTS OF  
 THE CANADIAN POSTAL COLLEGE, TEACHERS AND NATURALISTS.

**Canadian Postal College of the Natural Sciences.**

This Institution aims to awaken and foster a more general interest in Scientific knowledge, to induce young men and young women to engage in a systematic study at home, and to afford its members the means for mutual assistance in the pleasing and ennobling study of Nature's works. All efforts used to make the connection of students with this Association pleasant and profitable.

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A. J. PINCO, WOLFVILLE, N. S.

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Written for the MONTHLY.

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# The Canadian Science Monthly.

Vol. II.

WOLFVILLE, N. S., MARCH, 1884.

No. 3.

## Canadian Science Monthly.

A MONTHLY MAGAZINE,

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A. J. PINEO, EDITOR AND PROPRIETOR.

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The former name of this journal—the ACADIAN SCIENTIST—has been changed to the one that now adorns this page. The change is made in order that the name may be in harmony with the enlarged sphere of our magazine.

The success of our little journal is no longer problematic. In our present position we are warranted in saying that the MONTHLY will soon become the *representative journal* of the Natural Sciences in Canada, and will number among its contributors and patrons nearly every Naturalist of note. Besides the active members of the Directorate of the Canadian Postal College, we have already a long list of contributors, including many eminent Canadian Naturalists, as well as a number in the United States and other countries. This list, which is being lengthened daily, we shall soon publish, so that it may be seen how universal is the acceptance given the MONTHLY. Encouraged by such liberal support we have decided to take a step in enlarging

and enlarge our journal. If possible this enlargement will be made in our next issue, when the size of the MONTHLY will be increased to 32 pages.

As we publish but ten numbers this year it was our intention to take our two months' vacation at midsummer, but for good reasons we have concluded to make the suspension now. In spite of our best efforts to control circumstances we have hitherto been unable to get the issue from the hands of our printers before the latter part of the month, and sometimes it has been so that not till the beginning of the succeeding month could the publication be sent to our subscribers. This has been very unsatisfactory to us, and we are bent on reform. We intend that the June number shall be sent out at the beginning of that month or during the latter part of May, and similarly with subsequent numbers.

But our strongest reason for the present suspension is that we are just making a change in our business to give us increased facilities for publishing. As arrangements are also being made for enlarging the sphere of the Postal College and for the more complete and effective carrying out of the programme, every spare minute of our time, including hours of needed rest, are employed to that end. In view, therefore, of the circumstances and of what we have promised, we feel sure that our subscribers will be patient under the delay.

Our contributors will kindly forward articles for publication on or before May 10th.

The Chairman of the Committee of Migration, mentioned in our last, informs us that the work is progressing rapidly. Already about 500 observers, exclusive of keepers of lights, have been secured. The U. S. Light House Board and the Marine and Fisheries Department of Canada have kindly distributed for the committee circulars and blank schedules to more than 1000 stations. Sets have also been sent to Newfoundland. Reports of observation have already commenced to come in.

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### Botanical Department.

Conducted by Prof. A. H. McKay.

## AMONG THE CRYPTOGRAMS.

NO. IV.

### SOME USES OF LICHENS.

"The living stains, which Nature's hand alone,  
Profuse of life, pours forth upon the stone;  
For ever growing, where the common eye  
Can but the bare and rocky bed decay,  
There science loves to trace her tribes minute,  
The juiceless foliage and the tasteless fruit,  
There she perceives them round the surface  
creep,  
And while they meet their due distinctions  
keep,  
Mixed, but not blended, each its name retains,  
And these are Nature's ever-during stains."  
—Crabbe.

The lichens of Nova Scotia are not yet fully known. Over one hundred species have been found in Pictou County alone; and it is quite probable that many additions will before long be made to that list. Instead of giving the history of one or more of these we shall take a general glance at some of the uses to which lichens are put, not only in Nova Scotia, but in various parts of the world. This general view will help to give a clearer notion of this group of humble plants. The

first in the order of time, then, if not in the order of importance, is the

#### GEOLOGICAL USE.

The first plant to secure a hold on the smooth surface of a rocky cliff or mountain side is the lichen. Its fine, powdery spores are wafted by the wind and adhere to the surface of the most polished flint. On this the growing plant paints its thin crustaceous thallus firmly, and the spreading stain chemically etches its adamantine foundation, making a rough surface which catches the dust specks floating in air. Thus a small patch of soil is formed which can support a larger lichen or a moss, which in like manner accumulates more material until a plot of ground takes its place, supporting weeds, grasses, bushes and finally the giant of the forest itself. Everywhere the lowly lichen is at work endeavoring to clothe the barren spots of the earth and preparing in the wilds of the rocky wilderness some place where man may find a place to dwell. So promptly do these dutiful vegetative creatures attend to this work that scarcely does the white hot lava of Vesuvius cool before they begin to take possession of it. So beautiful a description of this cryptogamic conquest is given by one of nature's truest poets (Crabbe) that we must quote him again:

"Seeds, to our eyes invisible, will find  
On the rude rock the bed that fits their kind.  
There, in the rugged soil, they safely dwell  
Till showers and snows the subtle atoms swell  
And spread the enduring foliage; there we  
trace  
The freckled flower upon the stony base.  
These all increase, till, in united years,  
The stony tower as grey with age appears  
With coats of vegetation thinly spread,  
Coat above coat, the living on the dead;  
These then dissolve to dust and make a way  
For bolder foliage, nursed by their decay;  
The long-enduring ferns in time will all  
Die and dispose their dust upon the wall,  
Where the winged seed may rest till many  
flower  
Shows Flora's triumph o'er the falling tower."

## Entomological Department.

Conducted by Dr. J. E. WHITE.

## PRACTICAL ENTOMOLOGY

## III.

*Netting.*— There are three kinds of nets required, one strong and shallow for use in the water, one for beating bushes, grass, etc., deeper and lighter in texture, and one for air captures, or an air net. A round brass wire as thick as a lead pencil, is made into a ring 12 or 14 inches in diameter, and fastened to a handle three or four feet long or longer if you like. To this ring is attached a conical sugar loaf of thin veiling or cheese cloth by means of a narrow band of stout cotton run over the ring; the net is to be sewed to the cotton band and is cut so as to run to a point about two feet and a half from the mouth. If the insects are small they will be found at the bottom part of the net which can be put into the cyanide bottle, net and all and corked, this is the surest way of securing them. A figure-8 motion quickly executed will secure and keep down in the net any capture, small or great. If the insect should be large and active secure it gently while in the net with your finger and thumb, and if you have a little vial of the saturated solution of the cyanide before mentioned, dip a match or little splinter into it and hold it under the insect, or near the bronchi under the wing, and instantaneous death will follow. You may try chloroform, if you have it, but put your large captures into pill boxes, or pocket case of some kind, not in the cyanide bottle; they are easier put in than got out, and the cyanide makes them brittle.

The ring of the *water net* which is stouter may be flat on the side farthest from the handle as it is occasionally used in dredging. There is much in the

water which must be scooped or dug up and put into the net and strained through by shaking it about in the water. One must go out specially with this net, and take a tin pail or pickle bottles in which to carry his captures. A botanist's pocket shovel is also necessary. Stones are to be turned over, for under them are frequently to be found larvæ and beetles, the study of which will prove very interesting to you.

The *beating net*, as its name indicates, is used in conjunction with a small sheet or umbrella for beating shrubs, branches, grass, &c. It is surprising what a vigorous figure-8 movement of the net worked about, over, under, indiscriminately, in and out among foliage and branches of every kind, will bring forth. Look in the bottom of your net and you will find it has secured much which your eye could never have detected. Transfer net and all quickly into the cyanide bottle, as described before. Numerous small insects are to be secured in this manner only, and though a beginner instinctively seeks after the largest and most showy ones, his collection is not so valuable as the one which contains those referred to. The sheet or umbrella is spread out under trees, shrubs, &c., and then by a blow on the trunk or branch, numbers of insects will drop into it; others, alarmed, must be caught up by the net.

*The air net.* This is similar in all respects to the one used in beating, except that it is lighter in material and will not stand rough usage. A beginner can dispense with the beating net, using a stick in conjunction with the air net.

*Forceps* will be also very necessary and are used to force the pin on which the insect is mounted into the cork or wood of the case. They are also handy for picking up fragments of insects which have been broken through carelessness or in transmission by mail.

Referring to pins again I may say that as long as you get the largest, or nearly the largest, it matters little where they are made. Let them all be of a uniform length. Always have a bottle of benzine at hand and don't spare it in finally preparing the insects for the case.

*Night Trap.* A convenient form of trap for collecting, one which may be left out all night, is made in this form. Make a box of pine eight inches square at one end, about sixteen inches long and flaring out to eight by sixteen inches at the other; put a square of glass over the small end; then cut two other pieces to fit the interior, one to run from the top of the trap obliquely downward and forwards, six inches back on the top to one inch back from end of the bottom and allowing space enough (half or third of an inch) for the insects to crawl under; attach the second piece of glass to the bottom, to run obliquely upwards and forwards, leaving space *above*. Place the trap thus made on the ground, fence, shed, anywhere you think captures may be made; now put a small coal-oil lamp near the small end and protect it from the wind by shingles or an old stove-pipe with a piece cut out large enough to let the light through to the trap. After arranging it stand aside and see how it works. The light shines strongly through the end glass and out through the large front. Soon a moth is attracted to it. He flies direct, strikes the glass and falls to the bottom board. He then crawls, *unobstructed*, along the bottom, through the opening left below, until he comes to the second glass. After vainly endeavoring to get through this *at the bottom*, he climbs up the glass, or sides until he finds the opening of the second glass *at the top*; he then is in the second chamber, and plays around on the flat glass, outside of which stands your lamp; he won't

face about to get out, as it looks too dark. In this manner it is surprising how many specimens may be secured, and that without toil.

*Cases.* Two kinds of cases are in general use—the post or exchange case and the library case. The exchange case is made to hold, when filled, not more than eight ounces, that being the limit for Natural History specimens between Canada and the States. It is made  $4\frac{1}{2} \times 1\frac{3}{4} \times 9$  inches, of light hard wood and costs about six cents. This, lined with thin cork, may have the specimens on pins, or may be filled with specimens folded in small envelopes, then a roll of cotton wool put in, to keep them from shaking, and another roll of wool on the outside, and all covered by thin, light muslin and kept on by two elastic rubber bands. The object of enclosing the box in cotton wool is to prevent damage while in the not too careful charge of the postal authorities.

*The Library Case.* The size generally adopted here is  $17 \times 11 \times 2\frac{1}{2}$ , inside measurements. They are folding cases, and when painted and round-backed present a very good appearance in a library. They are made of well-seasoned wood and ought to have, after painting, a good coat of shellac varnish. They cost about fifty cents each. Both of these have been made for me by Hemming Bros., box-makers, Toronto, and please me very much. This is the size and style adopted by the Natural History Society after many experiments

*A final hint in reference to the setting board.* After placing the insect on the board extend the wings, so that the inner border of the front wing forms a right angle with the line of the body. Have this uniform throughout your case, and the effect is much more pleasing; also, before putting the cardboard or glass on the wings, lay a thin

piece of paper on them, then if any twist or shake occurs, the beauty of the wing—the scales—will be better protected. This is a plan adopted by that enthusiastic lepidopterist, Capt. Geddes.

This concludes the details of the principal requirements for beginners in this delightful study, and hereafter the papers will be descriptive of the various orders.

#### BRIEF REVIEW OF BOOKS RECOMMENDED FOR THE ENTOMOLOGICAL DEPARTMENT.

*Packard's Guide to the Study of Insects*, Estes & Lauriat, New York, is a standard and thorough description of the various forms of insect life, and is indispensable to the entomological student.

*Packard's Half Hours with Insects*, Estes & Lauriat, New York, is exceedingly interesting reading and correct and reliable; it is more suited to those wishing to obtain a light and interesting fund of information concerning insects.

*Orton's Comparative Zoology*, Harper Bros., New York, will give a most excellent idea of the status of insects in the animal kingdom; it is most thorough and suitable for all naturalists.

*Lubbock's Origin and Metamorphosis of Insects*, Macmillan, New York, is a well-written work upon the various changes through which insects pass; it is very necessary that students should be quite conversant with this subject, and much profit and pleasure is to be derived from its perusal.

*Wonders of Insect Life*, Amer. Bapt. Pub. Co., Philadelphia, is a most complete and interesting work for lovers of nature to peruse. It is written in that free, conversational style which so well suits that large class of readers who delight in brief sketches on scientific subjects, but who do not care or have not the opportunity to thoroughly master a subject.

*Woods' Illustrated Natural History*, Harper Bros., New York, is most prolific in illustrations, and has brief descriptions of representatives of almost every family and species through the whole range of Natural History, is very well got up and will help the student to gain a general idea of the classification of the various subdivisions of nature's kingdom.

*Meanton's How to Catch and Prepare Insects*, P. Boyle, Yonge St., Toronto, is a brief and accurate little book on this subject, and will be found useful to the beginner and save him the expense of experience.

*Naturalists Manual*, by Oliver Davis, Boyle, Yonge St., Toronto, is a very complete and cheap little work, treating of Birds, Nests and Eggs, as well as Insects. It is accurately

written and serves its intention very well—that is, teaching beginners.

*Check and Label Lists of the Insects of Canada*, Boyle, Yonge St., Toronto. These are complete lists of all insects known or identified in Canada, to the date of publication, and will both be required—the Check List to make exchanges with others, and the Label List for pasting in the cases after identification.

## Mineralogy.

By Prof. S. K. HITCHINGS.

### HORNBLLENDE.

Composition, silicate of magnesia, lime and iron; long and bladed but sometimes thick and blunt; often marked by longitudinal striae. Occurs in granular masses, coarse or fine; cleavage, lengthwise of crystals; breaks easily, transversely. Lustre, glassy or pearly, fibrous forms silky. Color, usually black or green. Translucent to opaque. Hardness 5 to 6. Varieties: *Tremolite*. Color, white or grey; usually in slender crystal.

*Actinolite*. Color, bright green, sometimes glassy; also occurs massive forming *actinolite rock*.

*Asbestos*. In fine flexible fibres, easily separable by the fingers, resembling flax.

Hornblende occurs in *Hornblende rock*, a hard granular rock, found abundantly at St. Francis, Canada. In *Syenite*, a granite-like rock, it is found with quartz and feldspar.

*Dolerite*, a fine tough trap rock.

*Aphanite* is like dolerite, but without distinct grains.

*Hornblende schist*, of schistose or slaty structure.

### FELDSPAR.

This name is applied to a class of minerals that are alike in several respects. They have a distinct and easy cleavage in two directions, forming



oblique angles Lustre vitreous, but often pearly on the face; perfect cleavage; usually translucent to opaque. Hardness 6 to 7. Color, white, grayish, reddish or green. Composition, silicate of alumina and either lime, soda, potash or perhaps two together.

*Anorthite* is a lime feldspar. Color, white or grayish; crystals tabular; fuses with difficulty in blowpipe flame; decomposed by hydrochloric acid.

*Albite* a soda feldspar Color, white, occasionally with some light tint; crystals thick; usually occurs massive with a granular laminated structure; fuses to a clear or white glass, coloring flame intense yellow. Is not affected by acid.

*Orthoclase*, (common feldspar,) a potash variety, in thick prisms or massive, fine or coarse, color white, gray, flesh-color, or greenish. Fuses with difficulty; not acted on by acid. By decomposition this forms the base of clays. It is one of the constituents of granite, syenite and gneiss and occurs in porphyry.

*Oligoclase*, a soda-lime variety, sometimes with potash also. Fuses without difficulty to a clear or enamel-like glass; not materially affected by acid.

*Labradorite*, a lime-soda form; color dark gray or greenish brown: usually in cleavable masses showing a beautiful internal reflection of blue, green or yellowish light; used as a gem. It forms a part of most varieties of cleverite and amygdaloid.

#### MICA—(Muscovite.)

This is a silicate of alumina and potash with a small amount of iron; some varieties have other elements in small quantity. It usually contains from one to four per cent of water. Mica usually occurs in plates or scales, which split easily into thin laminae which are remarkable for their toughness and elasticity. It is probably net

equaled in the combination of these two properties by any other substance.

It is sometimes found crystallized in six-sided or diamond-shaped prisms. Color usually white, grey or brown, sometimes green or red lustre transparent or translucent; hardness 2. The transparent variety when found in large sheets is used in place of glass in stove doors, lanterns, &c., and is improperly called isinglass. A variety with scales arranged in a feathery form is called *plumose* mica.

Mica is found in many of the older rocks, as granite, gneiss and mica schist; also found in limestone.

Formerly most of the large sheets of mica used in this country came from Russia, but it is now found in excellent quality in several places, as Grafton, N. H., Paris, Me., North Carolina, and in the Rocky Mountains

It is decomposed by long exposure to the air and water, but much more slowly than the feldspar, with which it is usually associated, so that the glistening particles of this mineral are often seen in the soil and sand. It is frequently colored by oxide of iron to a golden yellow, so that it is not unfrequently mistaken for scales of gold. *Biotite* is a black or dark green variety of mica. *Phlogopite* is a yellowish brown, or brownish-red variety usually found in granular limestone. *Lepidolite* occurs in aggregations of scales of a lilac or rose-red color, containing the rare metal lithium.

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The asteroids, or minor planets, are situated in a ring or cluster between the orbits of Mars and Jupiter. Ceres and Vesta are the largest of the group, their diameters being about two hundred to four hundred miles. The disks of all are so small as to defy exact measurement.

## WINTER NOTES ON ORNITHOLOGY.

By Prof C. B. WILSON.

## I.

The best time in which to commence the study of ornithology is winter, paradoxical as such a statement may seem. We are accustomed, and rightly too, to associate our ideas of wealth in bird life with the coming of spring, when soft vernal breezes blow through the woods, when the leaves begin to open and the early flowers to blossom, when everything in short seems ready to burst with the potent life and energy it contains. But this very wealth and pregnancy forms the great stumbling block which clogs the threshold of every department of science, and effectually hinders the entrance of many who would otherwise find within both healthful recreation, and a never failing source of pleasure in all their varied intercourse with nature. But the mere fact that there is much to be mastered, and that too before one can lay claim to even a limited knowledge, should afford a serious obstacle to no one: it is rather an incentive, enhancing the value of such knowledge when once acquired, and not the difficulty of its acquisition.

At this season of the year, however, we escape the dilemma completely, for the vast majority of the birds have long since migrated to the warmer south and the few that remain fairly force themselves upon our attention, their very scarcity rendering them the more conspicuous at a time when all animate nature seems to gather together for the sake of the warmth and genial cheer afforded by companionship. We are out of doors less in winter and so live more inwardly, becoming thereby both natural and necessarily more hospitable and social, drawing nearer the objects of our study which become for the time

being our book companions. We study them as only they should be studied, as fellow-beings sharing life in common with ourselves, and there is no necessity of ending these useful lives for the sake of gratifying our curiosity.

There is a certain indefinable yet intensely potent charm in finding so much that is alive and ruggedly vigorous, when to the careless or indifferent nature seems to present only dreariness and death. Enough of life itself, or its immediate products is always at hand, even in the coldest winter weather, and is well worth all the attention we are willing and able to bestow. Fortunately there is another fact which also tends to diminish the obstacles in our progress. There is no need of lengthy descriptions preparatory to the science. Even the variest tyro can tell a bird at a glance and will never mistake it for any other member of the animal kingdom. This individuality is also paralleled by that of the species so that we may readily distinguish between a crow, a hawk, an owl and a robin. But our work is only begun when this distinction has been clearly established. Individuality of course reaches its acme in the lives and habits of individuals. These must be studied separately, no sure nor even probable knowledge can be drawn from relationship.

There are about 30 species that reside with us in these northern climes the year round. To these add 20 more that straggle downward in the winter from regions yet farther north, and we have all that can be met with under the most favorable circumstances. It need not, and it does not take long to master these 50 species, and once mastered they furnish us the key that will unlock all the mysteries of the feathered world. We shall then become acquainted with one member of nearly all the

prominent families, and have therein a criterion upon which to depend in future work. All through the long spring and summer, as the migrants arrive singly and in flocks, we can assign to each its appropriate place, our old acquaintances of the winter appearing continually to guide this classification, and before we are well aware of the fact we shall find that we possess a greater or less knowledge of every bird that can be found in the fauna of our locality.

The obstacle, if it be an obstacle, presented by the multiplicity of individuals and species is thus in a great measure diminished by this grouping into families, orders and classes. A simple, accurate and exceedingly convenient classification of those birds presented in our northern fauna can be found in E. A. Samuel's "Birds of New England and adjacent States." This, examined in the light afforded by similar classifications more recently published in Dr. Coues's, "Keys to N. A. Birds," and in "the History of N. A. Birds," by Baird, Brewer and Ridgway, comprises all the later developments in N. A. Ornithology. From a comparison of these authorities we have,—

#### CLASS A.

*Those birds in which the hind toe is on the same level with the front toes.* These are aerial birds, whose life is passed almost wholly on the wing or among the trees; whose wings, therefore are fitted for flight, long and swift and strong as in the eagle, or exceedingly rapid as in the humming bird, whose feet, by this leveling of the toes, are adapted for grasping as in birds of prey, or for perching as in the songsters whose gait accordingly, whenever they do attempt to move on the ground is a hop rather than a walk. They always live in pairs and the young are hatched

helpless. In this class are embraced several orders.

ORDER I. *Passeres* or perches, the highest order among birds. All live habitually in air and though other birds perch, these are pre-eminently the perchers, and are rarely on the ground. Most of them have a sharp, conical bill which they employ to the destruction of insects and worms, rendering more service in this way to the farmer during a single season than he could repay in his life-time. They are rapid breathers and have a correspondingly rapid circulation, hence they use the most oxygen and live the fastest of all the birds. There are two groups of passerine birds differing in the structure of their vocal organs. (a.) *Oscines* or songsters proper, having the vocal organs highly developed though they do not sing, as we commonly accept that term. They excel in quality rather than in quantity, being mostly of small size. With few exceptions the eggs of all are colored. Here belongs that host of birds whose bright colors and lively songs give energy and melody to our woods and gardens, and make them the most interesting of their kind—Thrushes, Warblers, Sparrows, Larks, Orioles, Vireos, Swallows, Wrens and Finches. Here belong also the Crows and Jays who, if less highly favored in melody, have, nevertheless, their appropriate places in Nature's picture and admirably fill it.

The smallest of our birds, except the humming-bird, is the Golden crowned Kinglet, (*Regulus satrapa*), a winter representative of the *Oscines*. His characteristic livery is an olive-green back; a black head with a central spot of orange red, encircled and often concealed by gamboge yellow; a dusky space around the eye with a white line both above and beneath it; two whitish bands across the wing coverts, and a dull white breast. Much of his

nature and habits has been described above under the class and order to which he belongs. In summer he is an expert fly-catcher, capturing the smaller winged insects among the highest treetops of the forest; in autumn he frequents the orchards searching the bark of our fruit trees and ransacking every crack and crevice with microscopic scrutiny for the grubs and larvæ with which they are infested at this time. In winter of course he cannot ply these vocations of insect catcher and larvæ destroyer, and hence is most often found among the evergreens, pine, spruce or cedar, generally in company with the Nuthatch, the Brown Creeper, and Downy Wood-Pecker, the whole forming a gay, yet busy winter party as they roam about in search of their now scanty food. This food is still in the main grubs and dormant insects which lie concealed in the bark of the trees, and no man however expert or careful, could succeed half so well in ridding a tree of these enemies as this tiny bird.

Many writers speak of this King'et as having no song save a faint pipe or whistle or even a single chirp, but in late years this mistake has been rectified. Faint indeed, and by no means powerful his melody is yet a distinct and prolonged succession of pleasing notes, which he pours forth with utter abandon even in the midst of the most inclement weather. He is found most abundantly in the breeding season, and in the autumn and spring migration, April and October. The nest is pensile like that of his European congener, and in it are laid from 5 to 7 tiny eggs, scarcely larger than a humming bird's. These are of a pale white color, thickly sprinkled with buff dots. Two broods are sometimes raised the same season, and when we consider this fact together with his acknowledged industry which is exerted chiefly as the inveterate

enemy of everything insectile, we see that the bird, tho' such a diminutive mite being always under four inches in entire length, is nevertheless a most useful member of our feathered auxiliaries.

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### AN INTERESTING REPTILE.

RENA DULCIS. — BAIRD AND GERARD.

Read before the Natural History Society of Toronto, Jan. 7th, 1884.

*Mr. President and Gentlemen:—*

I have forwarded to your worthy Secretary, for your inspection, two photographs of this reptile, as well as the original, in a small bottle. It is the only one I possess, and, indeed, I may say that I do not think it likely any one else in Canada has a specimen, and I know that there are but few in the United States. I will now give you a statement as to how it came into my possession, and its general history as a species.

Last March, 1883, a man named Bell, who served in the capacity of a "pastor," or shepherd, on the Rio Grande, the great river that forms the boundary between Texas and Mexico, returned to visit his family and acquaintances in this neighborhood. He brought home a large pickle jar full of reptilian curiosities, thinking that they would astonish his friends here. I found on examination, among other interesting specimens, those before you. Of course it struck me at once, as I had never seen anything like it before. On first seeing it I was much puzzled, and very particular enquiries were made. "Where did you get this little snake? Was it alive or dead when you found it? Was it not under some log or a large stone? &c., &c." He was perfectly free in his answers, and quite frank. He

was fishing one day on a stream that ran into the Rio Grande, and was searching for bait under some logs and other floatwood on its banks. He was looking for a frog and by chance came across this reptile. It endeavored to burrow, or thrust itself into the soft earth, to which it was so similar in color that he thought at first it was a twig or rootlet that he had moved, but by its self-actions he saw it was a living animal and he picked it up. He had never seen anything like it before. It looked as if it had neither eyes, nor mouth, nor tail. In fact, he did not know which end was the head, and the idea at once struck him that it might be double headed, or a kind of scaly worm, but it was so curious that he put it in his pickle bottle.

In May of this year, 1883, two consignments of reptiles reached me from Bexar Co., Texas, forwarded by Gustave Toudouze, Esq., and in them were three specimens of the same remarkable reptile. At first I scarcely knew whether to accept the statements of Bell as fact or fiction, but when these similar specimens reached me from a most reliable source, and also from Southern Texas, all doubts as to his veracity of course vanished. Mr. Toudouze was written to and asked for the particulars of its capture, and he replied as follows: "In regard to the little animal it is unknown to persons in Texas. It is exceedingly rare, and lives in the low bottom lands on the borders of rivers, under leaves and old stumps and debris of wood. I find some analogy in it to *Anguis fragilis* or slowworm of Europe. I hope to send you others, as well as a living one, and to keep one at home myself in order that I may study it as it should be." This was perfectly satisfactory, and although the exact date of capture was not given it can be stated with certainty as in the latter

part of April or first week in May, on the banks of the Medina River, some eighteen miles from San Antonia, in Bexar Co., Texas. On first seeing it I considered I had re-discovered the *Ophtholmidion Longisimum*, or a species or a variety of it. I sent two specimens to the Smithsonian Institution as such, and was requested to allow it to remain as it had heretofore been considered a myth. Now hereby hangs the tail. After no small trouble I had sent a long paper to be published in the *American Naturalist*, with exactly two such photographs as you have before you. Now, the editor of that magazine is Mr. Cope, one of our best herpetologists. He was struck with the great resemblance between these photographs and the *Rena Dulcis*, or as it is now termed by some means "*Stenostoma Dulce*" He wrote me on the subject, and stated that on this account he had requested Mr. Baird to forward him one of my specimens for examination, and he considers it is the latter and not *Ophtholmidion Longisimum*. To satisfy myself I have written to France on the subject, to one of the first herpetologists living, and as soon as I get his reply I shall lay it before you.

But to proceed, in regard to its history and the family to which it belongs. Both *Rena Dulcis* and *Ophtholmidion* belong to the family *Typhlops* or the *Typhlopsidæ*. They are all burrowing reptiles, and seek their subsistence in the soft earth in damp places. Some prey on small worms, the smaller insects, mollusks and their eggs, or on the decaying animal and vegetable matter so abundant in the sub-tropical regions of Texas, and the Gulf States and in the tropics. The genus *Typhlops* is also common in many parts of the East Indies.

The *Typhlopsidæ* have a flat head, or more properly depressed, broad,

rounded in front. Rostral plate large, oblong and erect, which makes it bend over the snout. Mouth semi-lunar under the muzzle. Eyes, under scales, obscure or wanting. Body cylindrical, suddenly contracted or obliquely convex at tip. Any one can see all these characteristics in the little lizard before you. *Rena Dulcis* belongs to the *Leptoglossæ*, that is, *lacertidæ* with a flat long tongue, cleft, more or less, at the tip. The ears, if any, are hidden below the skin. They are allied to the *Sepsidæ*.

The color of the back in this lizard is amber brown, and along the sides runs a well defined line of demarcation, and the under half of the body or belly is a clear, silvery, very light brown. The scales on every part of the body are smooth. Head, a very deep amber. Eyes, leaden, very obscure, beneath the skin. Along the abdominal line, at the breadth of a scale, there is an obscure line, upwards, of a brighter shade, extending from the angle of the mouth to the vent, and thence to near the end of the tail, where it is lost. The number of rows of scales encircling the body is thirteen in one specimen, and fifteen in a second, and encircling the tail twelve and thirteen, respectively. The anal scale is small, sub-hexagonal, and a shade darker than those surrounding it. Anus, semi lunar, obscure. The mouth is semi-lunar, and the lower jaw fits, as if into a groove, in the upper. The line of demarcation runs along the most external edge of upper jaw, and the recurved, under surface of the lip is white; likewise the throat is brighter than the rest of the abdomen. The specimens described are alcoholic. The eyes are leaden, very indistinct, and, as already stated, covered by a scale or skin, and of little use for vision. The tail is very obtuse, bent downwards to a plane with the abdomen at its termination, and the last

scale is prolonged and ends in a small, round sharp spine. This seems designed for assisting in progression. The body is glabrous, and the animal can move with equal facility either backwards or forwards. The body gradually enlarges from the head to the tail, where it is thickest immediately before the end.

The head is depressed towards the snout, which terminates in a blunt wedge, and the rostrals, for there seem to be two, are doubled under it and pass backwards, thus absolutely leaving no edge of a scale to the chance of being torn from its place as the typhloid burrows along searching for its food. The scales of the neck are small, and from the head gradually increase in size till over the vent, when they very slightly decrease till they end in the terminal spine, which is about the fiftieth of an inch long. Jaws, toothed. The following are the measurements in inches of one specimen:

Total Length.....	8 $\frac{1}{8}$
Of Head.....	$\frac{1}{8}$
Circumference of Body.....	$\frac{7}{8}$
Length of Terminal Spine.....	$\frac{5}{16}$
Breadth of Jaw.....	$\frac{3}{8}$
Snout to Mouth.....	$\frac{1}{8}$
Extent of Gape.....	$\frac{1}{8}$
Breadth of Head.....	$\frac{3}{8}$
Circumference of Tail.....	$\frac{1}{2}$
Length of Eye, perhaps.....	$\frac{1}{16}$

But the last measurement could only be approached on account of its extreme indistinctness.

The lower jaw is very solid at the symphysis, and the nasal bones are capable of great resistance in boring its way. Its food evidently is composed of small mollusks and worms, and also decaying matter, whether vegetable or animal, and the nares seem useful in discovering its aliment.

It is a most harmless and inoffensive little being, incapable of the smallest injury to man, and unobtrusive in

every way. Its exact sphere of usefulness in the great scale of creation seems to be in a humble way to assist to remove decaying matters and to keep down the smaller insects and their larvæ, etc., and by its small burrows to allow, more or less, the transmission of air into the soil.

The *tout ensemble* of the little being seems replete with design for its mode of life. The smooth hexagonal scales are so arranged that it can move in any direction and no resistance is offered to its progress. The small spine at the caudal extremity, firm and rounded, serves as a point for fixing the tail, so as to enable it to assist the head in burrowing forward, and the solid wedge-shaped snout is thus furnished with a fulcrum at the opposite end of the body. The lower jaw fits well into its place, and is completely covered over by the upper lip, so that with the strong inferior maxillaries a solid wedge is formed, and the smoothness of the entire scales enables it to glide on its way, giving the very smallest resistance possible to its progress. The whole animal would seem to glide through the soft bottom soils deposited by rivers and streams, and although the eager collector might have many specimens close at hand he would have no notice of their presence. The specimen before you was taken near the surface of the soil in April or beginning of May, and as Mr. Toudouze wrote me he found none afterwards it may be presumed they descended from the surface to cooler and deeper retreats, to avoid the parched surface of the earth and to follow their prey.

In concluding, I may say that both Mr. Baird and Dr. Yarrow examined my "Rena Dulcis" and considered it Ophthalmidon; and so did I. Nevertheless I may be in a grave error, and if so I am glad to be informed of it.

JOHN H. GARNIER, M.D.,

Lucknow, Ont.

## BASALTS.

By REV. D. HONEYMAN, D. C. L.

### 1.

Any one walking around the Blomidon shore at low water must be aware of the presence of hard crystalline rocks, presenting knife-like edges not to be trodden upon with impunity. One cut the sole of my field boots and others subsequently made walking very uncomfortable. The greater part of these were of irregular shapes, but many were true "basaltic prisms." As my examination of this region was geological I did not shrink from the task of bringing away some of these, notwithstanding their weight.

Having had my attention lately turned to the polariscopic and microscopic study of crystalline and metamorphic rocks, I selected one of those prisms as representative, "Blomidon" being a classic name in Mineralogy and not unfamiliar in Geology.

I had fine sections made of this and other rocks, by Dr. Julien of New York. Of these a polariscopic and microscopic examination was made and the results communicated to the Institute of Natural Science at its last meeting. The constituents of this microscopically homogeneous rock were seen to be Labradorite and Augite, with the accidental minerals, quartz, magnetite and Olivenite. The last was in small crystals, partly decomposed. The rock is a *dolerite*.

### 2.

The rocks of Blomidon are continued westerly to Briar Island. On the opposite side of St. Mary's Bay is Weymouth. When I was examining the geology of Digby and Yarmouth Counties I saw a large basaltic boulder near the railway station at this place. My hammer soon showed me that it was basaltic. The broken pieces examined "microscopically" with pocket magnifying-glass, showed olivenite in abundance

and in crystals of considerable size. As this was the first time that the mineral had been found in our basalts, and the second in any of our rocks—Dr. Harrington of Montreal having found it in one of the rocks at Upper South River, in Antigonish County—I bagged a number of pieces. A section of this rock examined with the polariscope shows much greater brilliancy than the Blomidon section. Its constituent minerals are labradorite and augite, its accidental minerals, quartz, magnetite and olivenite. The rock is a *dolerite*. It would be interesting to know the original site of this boulder.

## 3.

At Jebogue Point, Yarmouth, at the entrance to the Bay of Fundy, there is a dyke that crosses the beach showing a horizontal section and passes onward showing a vertical section among the metamorphic, Lower Cambrian strata. Its appearance and microscopic examination convinced me that it was basaltic. Its geological position was perplexing. It was darker in color than the Blomidon basalts, but this may be accidental. A section of this examined by the polariscope shows crystals of the same trichroic and triclinic feldspar, Labradorite. They are fewer in number and generally smaller. There is also augite in greater quantity. Of accidental minerals, quartz scarcely appears in the sections, although a microscopic examination of the rock shows that it is not wanting. Magnetite is in greater quantity than in the *previous sections*. This accounts for the rock having a blacker color, and also for the weathered portions showing peroxide. Olivenite does not appear. The minerals of this rock are therefore Labradorite, Augite, Quartz and Magnetite. It is a *dolerite*. I have not found basalts (*dolerite*), associated with any other formation than the Triassic and Jebogue Point *Cambrian*.

## A DEEP SEA FISH.

This was found at Cole Harbor, east of Halifax, and exhibited in the city by the owner. It is now in the Provincial Museum. It is allied to the *Himantolophus* and *Ceratias*, which were brought up by H. M. S. the Challenger from depths of 2400 fathoms in mid-Atlantic.

It is apparently of an anomalous character, being in some respects contrary to the usual analogy of fishes, e. g., its pectoral fins seem to be on its head rather than breast. It is a bottom fish having no ventral fins. It has small eyes and a tentacular organ on the head in adaptation to *phosphorescence*, the only light in abyssal depths. It has no scales except tubercules having the appearance of barnacles are to be regarded as such. Its length is 3 feet and girth 2 feet.

D. HONEYMAN.

Provincial Museum.

## ANTIMONY IN NOVA SCOTIA.

About three months ago what is proving to be a valuable lead of this mineral was discovered at West Gore, Hants County, by Joshua Bryson a returned Californian. Subsequent operations showed the metal occurring in a vertical vein varying in width from six inches to two and a half feet. The formation is Lower Silurian slate.

This promises to be one of the most profitable mines in our Province. The ore finds a ready market in London and sells at from £10 to £16 sig. per ton, according to quality. The mine is controlled by Mr. B. M. Davidson, of the firm of Davidson Bros., Halifax, an enterprising gentleman interested also in the Mt. Uniacke-gold mines.



## NATURAL HISTORY NOTES.

Another Natural History Club has been formed under the auspices of the Pictou Academy Natural Science Association to be known as the "Pictou Academy Ornithological Club." Honorary President, James McKinlay, Esq; Sec'y-Treas., Professor H McInnes; Taxidermist, Mr. Isaac Harris. The objects of the club are to study the habits and migrations of our birds and to mount a complete set of Nova Scotian birds for the museum of the Academy. Principal McKay is out in the local papers asking for the co operation of the public. Speed all such work.

From the research of the German commission on the Asiatic cholera in Egypt, continued later in Calcutta. India, it is considered that the vegetable nature of the cause of this terrible disease has been proved. Koch is the leading spirit of the commission. The cause of the disease is a microscopic alga, belonging to the Bacteria Family and to the genus *bacillus*.

*Nature* contains a letter stating that in the prairies of the Canadian North-West as well as in Kansas, Indian Territory, Idaho and Washington Territory there are no earth worms.

Tromholt of Norway, found the average height of eighteen measurements of the *aurora borealis* to be about 113 kilometers. Newton found by the same method the height to be about 130 miles or 209 kilometers.

"Y-dizi," is the name of a plant indigenous to Tonquin which is entirely new to science and superior as a fever plant to the eucalyptus. It grows to a height of about six feet, and is not only a nutritious plant, but it destroys miasma and purifies stagnant water.

Out of the 700 species of *solanum*..., known to botanists six produce tubers, but only the common potato *solanum tuberosum* has been cultivated extensively. Experiments are now being made

with other species, one of which yielded in one year 600 tubers and the principal stems were over seven feet long.

A new mineral for which the temporary name of *eucoclasite* is suggested is reported by the American Naturalist as having been found at Wakefield, Ontario. It occurs in white or grayish, white square crystals, sometimes an inch in breadth, and often glazed on the outside. They are nearly square prisims with truncated corners, the general appearance being that of a partly altered scapolite.

A new locality for topaz has been found near Pike's Peak.

Lake Erie and the Niagara have thirty-seven different marketable kinds of fish.

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 Canadian Postal College of the Natural Sciences.

## SECRETARY'S REPORT.—THE NEW NAME.

The selection of a new name for our Society has for some months been a subject of discussion among the directors and others interested in the work. The addition of new directors from time to time from the other Provinces of Canada and the spread of our membership throughout those Provinces seemed to make it advisable that a name broader, at least *national*, in its significance should be adopted. Many names were proposed and discussed, but out of the chaos the one appearing above was, by common consent, selected as the most appropriate.

Some interesting changes will also be made in the Society without departing from the original plan, the aim being to make the work more thorough and the instruction and direction more efficient. Indeed the institution may be said to be now passing through a transition stage and to be about entering upon an enlarged sphere of usefulness. We cannot refrain from congratulating those Dir-

ectors who, prompted by the most disinterested motives, have labored so zealously in placing this association upon its present successful basis.

#### ANOTHER DIRECTOR.

It is one of the most gratifying indications of the success of the Postal College that talented gentlemen from every part of the Dominion, upon examining the scheme and the manner in which it is being carried out, invariably give it their unqualified approbation; and also as an index of sympathy and encouragement, cordial and active interest is on every hand being manifested.

We are month by month recording new and valuable acquisitions to our staff of Directors in departments before unfilled. Now that our Society is becoming known and recognized among the best scientific circles willing and enthusiastic workers are not wanting; and we feel warranted in saying that very soon our directorial staff will be complete having one or more active naturalists representing each department. It is with pleasure that we announce that Mr. Ernest Seton of Assinaboia has consented to accept the directorate of the department of Ornithology. This gentleman is Vice-President of Toronto Natural History Society, Corresponding Member of Manitoba Historical and Scientific Society, Superintendent of North-West Territories for the observation of the Migration of Birds, on behalf of the American Ornithological Union, of which he is an associate Member, Member of the Royal Academy School of Art, London, England, etc.

Mr. Seton is characterized in a communication before us from one of our best American ornithologists, as "a young man of unbounded enthusiasm and large promise." He has long been laboring on his forthcoming work, "The Birds of Canada," which will be

eagerly looked for, the more so as his own artistic pencil will preside over every plate. In the person of Mr. Seton is added to the directorate a support not easily estimated, and an invaluable friend and councillor to those members who will avail themselves of the privilege of his correspondence. His address is Assinaboia, via Carberry, Manitoba.

We regret to have to report the resignation of a member of the directorate, W. P. Shaffner, A. B. Mr. S. is a rising young lawyer, and owing to increase of professional duties, feels that he cannot give to the work of this Association the attention that it demands. We think that we may, on behalf of the Board, assure Mr. Shaffner that he has our best wishes for his success.

The new announcement will probably be ready for distribution early in May.

By a mistake of the compositor the list of Directors in February number is incomplete, some names and departments having been omitted. We shall leave the corrections, however, to be made in the forthcoming announcement.

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#### THE THINGS THAT MAKE MEN.

It is not the best things—that is, the feelings which we call best—that make men; it is not the pleasant things; it is not the calm experience of life; it is life's rugged experience, its tempests, its trials. The discipline of life is here good, and there evil; here trouble and there joy; here rudeness, and there smoothness; one working with the other, and the alternations of the one and the other which necessitate adaptations, constitute a part of that education which makes a man, in distinction from an animal, which has no education. The successful man invariably bears on his brow the marks of the struggle which he has had to undergo.

### Literary Notices.

Volume I of the *Transaction of the Linnean Society of New York*, is a most valuable contribution to scientific literature. The leading article is by Dr. C. Hart Merriam, in which the author, in his peculiarly felicitous style, conveys a great deal of interesting information—interesting to the unscientific reader as well as to the naturalist—on *The Vertebrates of the Adirondack Region*.

We are happy to state that Dr. Merriam has kindly consented to become one of our contributors.

The *American Naturalist* for March contains the following leading articles: "The Crab Parasite, *Sacculina*" (illustrated), by *Karl F. Gissler*; "Men Ignorant of Fire," by *Titian R. Peale*; "Grave Mounds in North Carolina and East Tennessee (illustrated), by *Cyrus Thomas*; "Colonial Organisms," by *Charles Morris*; "Anatomy and Physiology of the Family *Nepidae*," by *William A. Lacy*, and "The *Creodonts*" (illustrated), by *E. D. Cope*. On the editor's table we find a very appropriate note on "Law and Insanity." The general notes abound in the most interesting news in every department of Natural History.

In the *North American Review* for April there is an interesting discussion concerning the question of admitting foreign built ships to American register. Judge J. A. Jamieson, in the same number of the *Review*, discusses the question, "Shall our Civilization be Preserved," pointing out the means that are at hand for withstanding the various agencies, physical, moral and intellectual, that threaten to overturn the existing civil and social institutions of our neighboring republic. Other articles of interest are: "Development of Religious Freedom," "Changes in the Climate of North America," "A Plea for Modern Languages," "Literature for Children," and "Recent Criticisms of the Bible."

*The Birth and Growth of Myth*, by Edward Clodd, F. R. A. S. Price, 15 cents, post free. J. Fitzgerald, Publisher, 20 Lafayette Place, New York. This work forms No. 54 of the "Humboldt Library of Popular Science." It comprises twenty chapters, with an Appendix, and gives a very intelligible account of the origin and development of mythological stories, from the scientific point of view. The chapters entitled "Nature as viewed by Primitive Man," "Personification of the Powers of Nature," "Metempsychosis and Transformation," "Aryan Mythology,"

and "Survival of Myth in Historical Narratives," are singularly interesting, and present in popular form the results of the most recent researches in Mythic Lore. We send this valuable work post-paid on receipt of price.

### Exchange Department.

Every subscriber has the privilege of inserting in this department one notice, not exceeding five lines, each year. Beyond that, and for non-subscribers the charge is five cents a line.

Land Shells and L. S. Fossils in exchange for Minerals, Sea Corals, and Star Fish.  
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