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1885.



THE

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

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# Canadian Science Monthly.

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AMONG THE CRYPTOGAMS.

By PROF. A. H. MCKAY

PAPER VI.

WHAT IS A LICHEN?

There is a little touch of romance in the most popular theory of the nature of the lichen. Sachs of Wursburg, in his text book follows without hesitation the views based on the researches of Schwendener, Famintzin, Baranetzky, Bornet and Reess, that the lichen is a compound plant. When its structure is microscopically examined, we find its tissue to be made up principally of the colorless thread-like cells of the fungi. Its spores, also, are produced in small sack like cells in the apothecia, exactly like those of an important division of the fungi. But when a section of a lichen is made with a sharp-knife and examined even with a small pocket microscope, green cells may be seen either scattered or in layers in the substance of the frond. These green cells have chlorophyll in them, whence their color. They are therefore in striking contrast to the pale fungous threads which so completely invest them. What are they? Their universal presence in the lichen was observed by the older lichenologists who called them *gonidia*. In some species the *gonidia* form a regular layer in the substance of the lichen, called the *gonidial* layer. Well, the romance theory is this: These green cells are the cells of a plant belonging to the algæ. The spore of a parasite fungus alights upon the youthful alga. It germinates thereon, and sends out its pallid shooting cells, which completely encircle in its grasp its green-celled prisoner. The prisoner still grows however, its expanding frond insinuating its dissevered cells between the meshes of the investing coils. The cells increase *pari passu*, drawing their nourishment from their imprisoned victim. The fungus is the parasite, the alga is the host. The two combined form the one plant, whose configuration varies according to the species of algæ or fungi present. If cannibalism can exist, and man can hold property in man, if the ant can subjugate and domesticate the small aphides to milk them, why should one plant not be able to subjugate another and keep it in 'durance

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vile' for its own special use. 'Oppression ends not with the reign of men.' It is one of the vices of nature, and is not, it appears, confined to one race or to one kingdom.

This theory is not accepted by all lichenologists however. Tulasne thinks he saw one of these green cells grow out of the fungoid cells. This is still in doubt. On the other hand, Famintzin and Baranetzky, by freeing the green gonidial cells from the surrounding fungoid tissue, have enabled the gonidia to develop into a plant. Schwendener extended these investigations elaborately. Bornet sowed the spore of a fungus upon an alga, and found the fungus to attach itself to the cells of the alga. Reess carried on this method of synthetical proof of the theory with great success developing lichens from algaoid and fungoid elements. Sachs, accordingly makes no separate class for the lichens, but includes them as a subclass under the Fungi.

Behold the forest scene ! and trace  
The wealth of beauty and the grace  
Which make it Nature's festal place.

The laughing leaflets up on high  
Like spirits dance beneath the sky,  
At which the love sick zephyrs sigh.

These columns rising from the ground,  
With moss and ivy-garlands bound,  
And nature's living foliage crowned,

Are sculptured also, as you see,  
With living lichens on each tree,  
And algæ struggling to be free.

The lichen feigns a sullen rest ;  
But fiercely struggling in its breast  
Is gentle Alga sore oppressed.

The monster fungoid lichen bold,  
Like dragons of the time of old,  
Hath gentle Alga in his hold.

And Alga calls from every tree :  
"O, who shall come to set me free ?  
The sun's sweet light I never see."

But never errant knight is there  
To battle for his Alga fair,  
Her wailings vanish in the air.

So thus these joyous haunts contain  
Suggestions of the ill and pain  
Which all through Nature's realms reign.

Movements Observed in certain Animals after Death.

By J. EMILE BONNET.

(Translate from the French.)

For a long time it has been noticed that after the death of an animal, its body is still capable of producing certain movements. This phenomenon is observed in a large number of animals, but in certain ones it exhibits more remarkable peculiarities. Let us take a frog for example. If we cut off the head of this animal with a sudden blow so as to injure its organs as little as possible, we can observe the very curious fact that its heart still continues to beat for several hours.

At the International Exposition at Paris in 1878 one could study in a physiological laboratory, several of these animals thus decapitated and could hear the beating of their hearts, at least with a microphone. One could make upon the frog a still more interesting experiment. If we take one of these batrachians, recently decapitated, and put upon its back a drop of strong acid, sulphuric for example, we shall immediately perceive one of the hind legs of the animal stretch out in an effort to rub the part burned by the acid.

What is the cause of this phenomenon? Is the frog still living in spite of its decapitation? At the first view one is inclined to reply in the affirmative, and certain physiologists of acknowledged proficiency think that the animal actually lives several seconds after decapitation, for, they say, we cannot admit that an animal that makes efforts to carry relief to a wound is altogether deprived of life.

This, however, is nothing. The decapitated frog is quite dead and we must seek for some other cause for these movements than the survival of life. Let us distinguish first between the two examples which we have given and examine in the first place the second. Every one knows that there exists in the superior animals two kinds of nervous movements: First, the cerebro-spinal movement which receives impressions from without and transforms them into action. This is the nervous system of conscious life. It has its centre in the brain. Second, the grand sympathetic system which produces the automatic movements (digestion, circulation, etc.) This is the nervous system which is charged with the movements of organized life. It has its centre in a union of ganglia placed in the neighborhood of the stomach called *solar plexus*.

But in our second hypothesis the cerebro-spinal system is completely separated from its centre, while the grand sympathetic system is dependent upon its own. There is then nothing astonishing in this last instance; and it is precisely that which explains move-

ments of this kind in insects. We find the explanation of this peculiarity in a learned article on the nervous system of the cockroach, by Professor C. L. Miall and Alfred Denny, (Science Gossip, November 1884.) "Many familiar observations show that the ganglia of an insect possess great physiological independence. The limbs of decapitated, and even isolated segments, provided that they contain uninjured ganglia, exhibit unmistakable signs of life. Yersin and Baudelot's experiments imply that the ventral cord is divisible into an upper motor track and a lower sensory, *the centres of both motion and sensation lying in the ganglia exclusively.*"

The most remarkable thing about it is that the cerebro-spinal system can also produce movements. It has been discovered that the external impressions received through the sensitive nerves, not being able to be transmitted to the brain, since it is separated from the body are transmitted in the gray substance which occupies the centre of the spinal marrow where they are reflected so as to return to put the muscles in play by means of the motor nerves.

Let us return now to the first example. Since the animal is dead, it will be remarked, and its body consequently only inert matter, how can its body produce movements? How does it come to pass that it produces these without any excitation, as the beating of the heart for example? I may be permitted to reply to this question by comparison. When we suddenly stop the engine of a steam-boat in motion we notice that the boat continues for some time on its way, on account of the momentum. It is thus with the organism of an animal deprived of life. Its organs continue to perform their functions for some time, then slacken their movements and finally cease. This is explained by the effects of vital energy surviving the energy itself, the same as in our comparison of the vessel continuing its way although the engine has stopped.

Cette, France, Oct. 20th, 1884.

VANESSA MILBERTI.

The economic value of this insect to the agricultural community can hardly be estimated by one not thoroughly acquainted with its havoc and depredations made among those hurtful and obnoxious weeds known as nettles.

Almost all lepidopterous insects pass their larval stage on some particular plant whose leaves are more to their taste than those of any other, while others partake of a great variety, not being partial

to any one in particular. By way of illustrating the former, I might mention *Quinque Maculata* whose green caterpillar, with lateral stripes and spotted body, is so destructive to the tomato. It will be noticed in the instances enumerated above, that one is as destructive in its depredations as the other is useful, hence the value of the study of Entomology, by means of which, more by observation than theory, we are able to refer each species to its respective class either beneficial or injurious. The favorite food of *milberti*, as has been previously mentioned, is the nettle, so that when nettles are plentiful, the following year we may expect to see numbers of *milberti*; and by these propagating their species, they in their turn so subdue the nettles that the following year is marked by their almost total annihilation, which must in a consummate degree reflect in a like manner on its destroyers. Consequent upon this, the nettles once more gain strength, but only to be again defeated when *milberti* has recovered from its stagnation. The above is a good illustration of the fact that some species are very abundant at one period while at another they are only noticeable by their absence. These fluctuations are often noticed in many of the *Vanesæ* and other butterflies, but cannot always be attributed to the same cause; for temperature, birds and ichneumons, as well as the absence of plant food, all tend to keep them in their respective places.

The more we look into the matter, the more we see the relation between the animal and the vegetable worlds. In the instances before mentioned we have one dependent on the other, which is in turn subdued thereby.

Were it not for this insect I have reason to believe that the nettle would be one of our most noxious weeds, but since it is kept down in the manner before stated, we have no fear that its spread will increase. I may say that almost all nettles I have come across have been literally crowded with its larvæ, but it would be difficult to say how many of these changed to perfect imagos as no doubt parasites attack them in the same way they do *V. antiopa*, which from my own observation is considerable, for out of eight chrysalids collected one afternoon, not one was alive, but each case completely filled with other pupæ. I have now shown the part *Vanessa Milberti* plays in the economy of nature, but before concluding I would impress upon my readers the importance of a thorough knowledge of entomology before dispatching any of our commonest insects. And what an injury we inflict upon ourselves in many cases by violating the laws of nature! We must learn to distinguish our friends from our foes, the beneficial from the injurious. Before we do this we must have some knowledge of that science which treats on the sub-



ject, viz, entomology. Because an insect feeds on a tree or plant it does not necessarily follow that it is injurious. It is only when they increase to more than the average quantity that they are hurtful. Who has not seen the gardener pruning the trees of his orchard, or the florist trimming his plants, and realized what advantage he is to gain from this interference with nature? He takes upon himself a great responsibility if he violates nature's laws, and must have foreseen that it was advantageous in regard to his own personal welfare, otherwise he would have left things as they were. It would be well to inquire and see in what way he has taken the law into his own hands. Many arborists are careful about their orchards, whilst others are negligent. The former prune and take care of their charge, while the latter trusts to nature for all its bountiful goodness. The difference between the two is this: one takes upon himself the duty of nature's assistants, the butterflies and moths, and the other is dependent on those assistants. It is needless for me here to enter into a discussion as to how the vegetable kingdom is kept under subjection, for we have already seen that illustrated in milberti and the nettle.

The florist by trimming his plants finds that they give more flowers, and it is a general axiom that where there are flowers in abundance there will be much fruit. It would appear that nature had in some way realized this when it caused the butterfly or moth to undergo its transformations, for in its first stage we find it trimming the plant, and after changing from the chrysalis reaping the full enjoyment of its work; we find it feeding on the leaves, and then on the honey of the flowers. Milberti is not preparing its future food by destroying the nettle, neither is it doing the nettle any good, so that it would appear its object in nature was to keep down a formidable foe to man. In some cases we have instances where insects are equally as injurious to our culinary vegetables and small fruits, but they are few and because some of their congeners have slipped a little further than their limit into the domain of man, vengeance has been declared upon the whole race, and all efforts are used to effect their complete extermination. There are few who can distinguish the difference in the larvæ of the sphingidæ, and many could not distinguish them from any other genera. *Quinque maculata* is a good representative of this great family and is known to most people by its larvæ feeding on the Tomato. The Plum Sphinx (*Sphinx drupifera*) is another, and is classed among the injurious insects.

Plants in the house receive more attention than those out of doors, and a small plot of land well attended to, is more product-

ive than a large one which has not received that attention. I have seen numbers of larvæ on a patch of tomatos, and after making sad havoc, the husbandman made them pay the full penalty of intrusion, namely death. The plants had received a severe check but he had looked to them in time. When his neighbor's crops were maturing he found his were equally well advanced, but like many men, he was not satisfied; he thought that if they had only been allowed to grow unmolested there would have been a far greater crop, and was mourning over the fact of their being disturbed. Had larvæ not attacked these plants it is probable they would not have been trimmed, and the crop would have suffered in consequence.

The Colorado Beetle (*Doryphora decemlineata*) has so increased as to be deemed a pest. No doubt it formerly kept itself in check in the same way as milberti; but since man has cultivated the potato, he has cultivated the potato bug with it; and it has left its home in the Rockies, to find more palatable food wherever the potato is grown. Poison is now used to destroy the pest, but, I know of instances where, when the potatoes have had a good start there has been no poison used at all and the tubers were equal to any in the surrounding neighborhood. We often hear people complaining of plants being "all top and no root." The reason is obvious. If there is no check on the aerial part of the plant it will take some of its sustenance from the root and will consequently deprive it of a part of its essential elements.

Although we have seen in what way some insects are injurious, we have not forgotten to give them credit for what little good they do, and when we consider that by far the greater number are not hurtful, we should be discriminate in our attacks upon our so called enemies.

*Venesa Milberti* has before been shown not to be injurious, but decidedly useful, therefore I have no reason to explain why it should be treated with respect. It is harmless in all its stages, and although not very prepossessing in the larval state, yet may rank as one of the most beautiful things in nature when it has passed into the imago. The color of milberti more popularly called the Canadian Tortoiseshell, is, as its name would imply, a mixture of black and yellow. Although these are the predominating hues a row of blue specks adorn the centre of that band which traverses the exterior margin, and a white spot is visible near the apex of each anterior wings. A black band extending on both sides of the body covers half of the disk, and the color which prevails between this and the outer band, varies from a bright yellow to deep orange. The

black band on the fore wing is characterized by two fulvous spots near the anterior margin, and when this band is continued in the hind wing a very dark crescent is formed. The underside of this, as in most of the *Vannessa*, is a series of dark, gray and black markings, which so correspond with the twigs, leaves and ground, that they are hardly distinguishable from the situations in which they rest.

JOHN B. SPURR,

Bradford, Ont.

Critical Note.

BY MONTAGUE CHAMBERLAIN.

In the October no. of this Magazine I pointed out Mr. Seton's mistake regarding the distribution of the Wood Thrush but I omitted to mention that he had made a similar error with the Catbird and the Thrasher.

Mr. Seton states, after naming the species of the Thrush family which are found in Canada:—"All these are abundant throughout Eastern North America. Like the Wood Thrush the Thrasher is found in these Eastern Provinces only in Southern Ontario and a small portion of Quebec. Both of these species are characteristic of the Alleghanian faunal area and are found but sparingly in the Canadian.

The Catbird is much too rare in these Maritime Provinces to be called "abundant."

Mr. Seton also makes a mistake in the statement that the Wilson's Thrush or Veery is the "commonest" of the Wood thrushes. This remark will only apply to the southern portions of these Eastern Provinces for in the more northern sections the Hermit and the Olive-backed are much more numerous than the Veery.

Mr. Seton has not given the Gray-cheeked Thrush among the Canadian species, and though I cannot recall any record of its having been taken within our boundaries it undoubtedly passes through on the way to a more northerly breeding ground, and some mention should have been made of it.

I am somewhat surprised at the statement of Mr. Seton that the Bluebird reaches the Maritime Provinces about the end of March, for instead of being "abundant all over E. N. America," as Mr. Seton claims for it, it is exceedingly rare here, and it would be a most difficult matter to determine the time of its arrival. I have seen but two examples of this species in New Brunswick, though I have heard of a few others being taken.

I am not prepared to say that the Gnatcatcher has not been taken in

Nova Scotia, but it should not be recorded as a visitor to that Province excepting on very positive and reliable evidence.

## Notes and Comments.

### Botanical.

Rev. Jas. Rosborough of Shelburne, Nova Scotia, in addition to *Ranunculus bulbosus* and the Scottish 'Broom,' reports *Actostaphylos uva-ursi* from that region of the country.

A monthly to be called the *Journal of Mycology* is proposed to be started by Killerman of the State Agricultural College of Kansas and Ellis of New Jersey. It will be devoted exclusively to the fungi. Price per annum \$1.00

A French chemist has obtained from the outer layers of birch bark a black gum which possesses the ordinary properties of guttapercha, and also the power to resist the injurious influence of the air and the corrosive action of acids.

### Biological.

#### PARTRIDGE POISONING.

NORTH SYDNEY, N. S., Dec. 15.—The circumstances attending the lamented death of the late John Barrington are as follows: On Thursday evening Mr. Barrington and family partook of birch partridges and soon after Mr. Barrington felt strange sensations, such as blindness and numbness in his limbs. He immediately asked the family about it and spoke of the symptoms of poisoning and feared they had been poisoned by the partridges. The symptoms developed rapidly and Mr. Barrington was completely prostrated and one by one the rest of the family were similarly attacked. Immediate measures were taken and the family all recovered so far as to be out of danger, except Mr. Barrington, who died on Saturday evening. Nothing is positively known explaining the presence of the poison, but it is supposed the birds had eaten the poison berries of the plant known as the "deadly night shade." There is no room for doubt that the birds were the cause, as even a cat that ate a piece was at once violently affected.—*Evening Mail*.

In a note in a former no. we referred to Dr. Somers' hypothesis that such poisoning might be caused by the birds eating of the leaves of the sheep laurel, *Kalmia*. What is meant by the "deadly night shade" quoted above we do not know.—ED.]

## MINERAL POISONING.

LOUISVILLE, Ky.—The staff correspondent of the *Courier Journal*, who is in the mountains of eastern Kentucky investigating the plague in that section, says the disease has spread with great rapidity and now extends over a large territory in Virginia and Kentucky, about 70 miles wide by 80 miles long. It is most widespread closest to the highest mountains. It generally takes some days for the disease to run its course and it generally proves fatal. In many instances those attacked died in a short time. Mineral poisoning is the real cause of the epidemic. It is a well known fact that the streams along which the disease is revealed find their beginning in the mountains among rocks containing alkali and other poisonous minerals. Until recently no rain had fallen for many weeks and the streams had nearly dried up. The water remaining, and which these people were forced to use, was powerfully charged with these poisonous substances and the continued use of it resulted in an epidemic. The number of victims of the plague will probably reach 1,000.

In some portions of Nova Scotia, especially in some gold regions, *arsenical pyrites* abounds. It has been suggested that the alkaline ashes from a felled and burned hardwood forest in these regions might cause the solution of sufficient arsenic from the pyrites to make the water poisonous.—Ed.]

## Zoological.

California Ostrich eggs are only \$120 a dozen.

A twelve year old boy was attacked by an eagle, which measured 8 feet from tip to tip, on Long Island a few days ago. He killed the bird after a desperate struggle.

Edward Howe is dying in a New York hospital from the effect of a scratch from an anteater which he received at a Coney Island aquarium in September,

Charles Halluck sends from New Orleans to the editor of the *American Angler* the femur and tibia of a frog, measuring conjointly five and a half inches.

New Orleans is suffering from an invasion of insects. They come at night and are everywhere, but are most numerous around the electric light. Millions of them cover the sidewalks and make a disagreeable sound as they are crushed to death by footsteps.

An octopus was caught recently with fish-hooks near Portland in Oregon. There was a great struggle in getting it into a boat and bringing it ashore. It was hooked in about three hundred feet of water. As it was brought

near the surface it seized upon the bottom of the boat, and no effort on the part of those in the boat could loosen it. Finally the boat was set in motion, when the devil fish dropped off on its own accord. One of its feelers came in contact with the arm of a boy who was in the boat, and the fish let go only when the feeler was beaten to a jelly with a club. It was what is called a monster specimen. Its arms, or feelers, were four feet long, and its purse shaped body was about one foot in diameter.

*Anthropological,*

Great Britain has 180,000 acres in apple orchards

There are 44 religious denominations in the United States.

Comely girls of marriagable age are sold in Yokohama for \$16 each.

The New Haven jail authorities are troubled with the ghost of an executed prisoner.

Seth Cook, of Rathbourne, who will be 103 years of age if he lives until Jan. 10th, 1885, recently walked 17 miles in one day.

The Astors alone own 3,600 houses in New York all stone and iron. The lowest rental is \$1,500, and the highest \$50,000 per annum.

There are probably a million stamp collectors in the United States. All the way from \$5,000 to \$200,000 have been spent by wealthy gentlemen in perfecting collections.

Investigations made by a committee of the British Association show that a man really grows in stature up to his fiftieth year, although the growth a very slow after twenty.

The *King Paw*, the official Chinese paper, was started in the year 911 as a semi-occasional journal. For some centuries it was a weekly and at the beginning of the present century it became a daily. It has six editors and a circulation of 14,000.

Dr. Sir Wm. Gull recently received \$5,000 each for two visits to Paw, and \$6,500 for remaining a week with a patient at Perthshire. Dr. Donesdale received in 1867, for inoculating Empress Catherine and her son at St. Petersburg, \$60,000 in cash, a life pension of \$2,500, and the rank of baron.

In the last ten years relics of the industry of the early inhabitants of Switzerland, known as the 'lake dwellers' have been accumulated in great quantities. Dr. Victor Gross states in a recent work that the articles of bronze alone which have been found in the lakes of Bienne and Neuchâtel number 19,600, of which more than 5,000 are in his own collection. Many articles of stone, pottery and iron have been brought to light in ad-

dition. In these archaeological discoveries Dr. Gross finds evidence that the period in which the prehistoric Swiss inhabited the dwellings built on the lakes was one of long duration, covering the successive stages of civilization from the primitive age in which metals were unknown and man's implements were rudely formed in coarse pottery and rough stones, through the age of finely worked stones, followed by the age in which stones were still used and metals were introduced, then by the age of fine bronze and a highly developed stage of the arts to the age in which iron appeared.

#### Mineralogical.

A pearl weighing 93 carats, and valued at \$17,000, has just been shipped from Guaymas, Mexico, for London. It was purchased from an Indian for \$90, and is believed to be the largest in existence.

Sir. H. E. Roscoe, at the British Association in Montreal, showed that the diamond is not pure carbon, but always contains a small amount of silica and iron oxide. He noticed and presented lithographed drawings of certain microscopic configurations in this ash, which he could not explain.

The proprietors of the antimony mine at West Gore, N. S., have been doing much to develop the resources of what seems to be a wonderful deposit. They have sunk two shafts over 160 feet each, besides opening drifts to the extent of several hundred feet. They have shipped largely, chiefly to London, where they realize about £52 to the ton.

#### Astronomical

On New Year's morning the Observatory at Greenwich adopted the new method of calculating time. Henceforward, the astronomical day will commence at midnight as is the case with the civil day, instead of at noon. The day will be divided into 24 hours numbering from 1 to 24.

HOT SPRINGS, Ark., Nov. 25th.—Julius Robbs, a farmer, was instantly killed this morning by a meteor, which descended through a tree, cutting the limb clean. It then passed through Robbs's body from the shoulder obliquely and buried itself in the earth. It was dug up to-day, and found to be an iron pyrite of the size of a tea cup. There is great alarm among the people of the country since the accident.

We remember of hearing a few years ago, that a meteor passed through the arm of a person in Germany. The phenomenon, which occurred in daylight, could admit of no other explanation. These bodies move through the air with greater velocity than the projectiles from human firearms.

#### Arts and Manufactures.

Paper money is 10 per cent. more valuable than coin in China.

Paper is now used in Germany instead of wood in manufacturing lead pencils.

Europe and British India consume about 120,000 gallons of handkerchief perfumes per annum.

Of the 270 fulminating factories started in Europe during the present century 261 have been destroyed by explosion.

They have captured a wild man down in Florida, swimming the lakes from island to island, who is supposed to have escaped from some asylum. He was nude and covered with hair; he could give no account of himself.

The smallest steam engine in the world has been made by a watchmaker in Philadelphia. It rests on a twenty-five cent piece. The cylinder is a little less than 1-6 of an inch in diameter. The balance wheel will make 1,000 revolutions a minute.

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Our needful knowledge, like our needful food,  
Unhedge, lies open in life's common field,  
And bids us welcome to the vital feast!

Young.

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## Correspondence.

### THE SPARROW.

I have read with interest and pain what is said upon the destruction of the sparrow. I have known sparrows all my life and that is not a short time. I studied their habits for many years and I don't believe the thirtieth part of what is written to their prejudice. I am amazed at the *furor* excited by them, especially in the "Quaker City." While I was in it at the Centennial Exhibition of 1876, I was delighted with the sparrows and the attention paid them. I have fed them in London, Paris, Dublin and Philadelphia. A pair had their nest in my Venetian shutters in Dublin and their young ones spent their nights on the corner of the sill on the outside of my window. I know that they have faults but where are the birds without them. I admire their pluck and energy and the manner in which they work for their living during our inhospitable winter when the birds of passage leave us to mourn their absence. I have too much of the spirit of a naturalist to look with complacency on the extermination of any creature with which nature has furnished us. I believe that there is a place in the economy of nature for all. I place the above *vis a vis* to the sentiment expressed in page 132 "Yet I cannot like the sparrow, etc." Some speak about the sparrows destroying or driving away other birds. I would like to be informed where these birds are, to be driven away. I live in a part of the country where there should be plenty of birds. I am as-



tonished at the scarcity of them. I have much occasion to visit other parts of the Province, where I find birds equally rare. The few that frequent my place are more liable to be destroyed by boys and other idlers with guns.

A good plea was suggested by a gentlemen who knows what he is talking about. The sparrows remain all winter and are on hand to destroy grubs and noxious insects when they make their first appearance, nipping them, as it were, in the bud. Birds of passage, which follow after their food, make their appearance later, when noxious insects gain ascendancy.

I would recommend the "western divine," refered to in page 148, instead of devising ways and means for the easy destruction of our proteges, e. g., the application of the fire engine, to give more attention to the study of Gospels and Psalms and to him who careth for sparrows.

D. HONEYMAN.

Prov. Museum, Halifax.

#### The Mayflower.

In the article on the Mayflower of the Loyalists, in the July and August MONTHLY, the author of the paper omits mention of one flower that is the Mayflower, *par excellence* of many counties in England. I allude to *Caltha palustris*, the common name of which is "The Mayflower," and is used on the first of May to decorate the houses, especially the doors and doorsteps. It generally flourishes best in rich, low, moist meadows, and the children make great efforts to obtain a bountiful supply of the rich yellow flowers for that day. The flower of the *White Thorn* is "May" in England, but not the *Mayflower*. *Caltha palustris* is the only flower that is distinctly called *The Mayflower*.

Very Respectfully

J. G. BARLOW.

Cadet, Washington Co., Mo.

#### I. N. S.

The Institute of Natural Science met in the Provincial Museum, on Monday, the 12th inst, at 8, p. m. Paper read,—“Notes of an examination of *Delphus delphinus*, the Museum Porpoise.”—By Dr. John Somers. Mr. Morrow also directed attention to a collection of West India *Mollusca*.—D. HONEYMAN, Secretary.

#### COMETS IN 1884.

The Comets of '81 and '82 were of such brilliancy and attracted so much attention that but little note was taken of the Comets of '84. Yet at least four comets, have been under observation by astronomers. The first was the Pons-Brooke comet discovered on Sep. 1st, '83. The second was discovered by Barnard of Nashville, Tenn. July 16th, 1884; in Perihelion Aug. 16th; the third was discovered by Wolf, at Heidelberg on Sept. 17th, and is still in sight in the telescope. The fourth is Encke's Comet reported by Prof. Young. It will be nearest to the Sun in March '85. There have been discovered during the year ten new asteroids making the present number 245.

Editorial Notes.

Our readers will observe that this number of the MONTHLY contains but sixteen pages of reading matter, a reduction in size which we are sorry to say will have to be continued for several months. The editors' life is a busy one and the very limited hours which he is at present able to devote to the publication of this little journal, while they are regarded as periods of recreation have to be borrowed from times of needed rest and hours that should perhaps be devoted to other duties. We hope however to soon be in a position to give more attention to the publication of the MONTHLY, when we trust that its usefulness, which we have reason to believe is even now not inconsiderable, will be largely increased.

Our subscribers will please take notice that their terms of subscription will be extended so that they will lose nothing by the reduction in size of the MONTHLY.

A circular descriptive of the Canadian Postal College of the Natural Sciences is sent to each subscriber. The Directors ask, in furthering their objects, the co-operation of all who are interested therein. Show the circular to your young friends and persuade them to join the C. P. C. With a larger membership, a deeper and more general interest will be taken in its work and its usefulness increased.

The Itinerant method of science teaching

It has been urged with considerable force against the introduction of science teaching into low-grade schools that the average teacher could not be expected to know enough of the subjects to teach them satisfactorily, and that it would be beyond the resources of most schools to provide the necessary apparatus.

These objections have been overcome in England by a method suggested a few years ago by Col. Lonnely and Prof. Huxley and now in practical operation in Birmingham. This is called "the itinerant method." Its principle features are: one competent instructor for a district, a centre where apparatus is kept, and hand carts with assistants for moving the apparatus to the several schools as it may be required. This plan seems admirably adapted to towns or populous districts where the schools are within easy distance of the central station.

The Polyzoa of the Challenger Expedition.

Although a popular account of this expedition was published some time ago, its scientific results are being gradually given to the world. A recent contribution in this line has been made by George Busk, F. R. S., in his report on the Polyzoa-Cheilostomiata. The number of species collected was 286 and of these about 180 species are new. The work of determining these must have been very great and it has been faithfully done. Thirty-six beautiful plates and an instructive map add very greatly to the value of the report.

ERRATUM. Sept. No. page 121, 1st col. lines 3 and 4, for "Drago and Boquet de la Grege," read "Arago and Bouquet de la Grye."

## Literary Notices.

**HAND-BOOK OF MINERALOGY.**—By S. K. Hitchings, State Assayer of Maine, and Director of Canadian Postal College of Natural Sciences, Biddeford, Me.

This is a handy little volume for the use of beginners. In about 10 pages the author gives all the general instructions in the use of the blowpipe and the application of chemical and physical tests necessary to enable the learner to proceed in the determination of minerals. In as far as the work extends it is complete, but we cannot but wish that the author had extended its scope somewhat to include a description of a typical series of common minerals that could be easily obtained by the student and would serve as a starting point from which he could go on to the determination of less familiar species. In connection however, with the author's series of papers on descriptive mineralogy, now current in the MONTHLY, this little book is most valuable,

Besides the 10 pages mentioned above, the book contains about 50 pages of blank schedules which the beginner can fill out as he proceeds in the examination of specimens. Teachers will find this little book valuable to themselves and just the thing to place in the hands of their pupils.

## Contemporary Journals.

**SCIENCE**, Jan. 16.—Man in the stone age; Recent advances in electrical and medical science; Some recent experiments with oil in stopping breakers. Jan. 23.—The muskrat carnivorous; The Peabody museum at New Haven; River pollution in England; Bark louse secretion; Recent Russian Geographical explorations.

**POPULAR SCIENCE NEWS**, February.—Easy Chemical experiments; A fish eating plant; The origin of opium; The regeneration of the potato.

**THE AUK**, Jan.—On the breeding habits of some Arizona birds; Bird names of the Selish, Pah—Uta, and Shoshoni Indians; Anitoban Notes; The nesting habits of the Cape May Warbler; Field notes from Pictou Co., Nova Scotia; Swainson's Warbler; The Heath Hen of Massachusetts.

**THE NATURALISTS' WORLD**.—Preparation of microscopic objects before mounting; The Culbin sands; The study of Geography as allied to Natural History.

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