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November, 1894.

THE
* OTTAWA NATURALIST *

VOLUME VIII. No. 8.



THE BEAVER (*Castor Canadensis*, Kuhl).

CONTENTS.

	PAGE
Marvels of Colour in the Animal World.....	115
Entomology.....	117
Notes on the Catfish.....	118
Botany.....	118
Geological Notes.....	121
Personal Notice.....	122
A Proposed Photographic Section.....	123
Book Notices.....	123
Winter Meetings.....	125
Jumping Beans.....	125

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MARVELS OF COLOUR IN THE ANIMAL WORLD.

A very interesting and instructive popular science lecture was delivered by Prof. Prince, Commissioner of Fisheries, in St. James' Hall, under the auspices of the "United King's Daughters," on the 26th March.

The Chairman, Sir Charles Hibbert Tupper, K.C.M.G., introduced the lecturer in his usual happy manner. The lecturer, after explaining the decomposition of light, went on to show that white animals and silvery creatures, like fishes, illustrated specular reflection. Striated surfaces broke up sunlight into prismatic colours, and produced in the feathers of birds, wing-cases of insects, pearly shells, etc., most gorgeous hues. Similar tints might be due to what the physicist calls "thin plates," instances of which occur in jelly-fishes and many glassy marine animals. One of the most frequent causes of colour was pigments or actual colouring matter in the tissues, in the skin, hair, or feathers. Three forms of pigments might be distinguished, viz: minute corpuscles, capable of expansion and contraction and usually stellate in shape, or larger masses called chromatophores, with muscle and nerve supply and controlled by the optic ganglion or, finally, a fluid bathing the tissues in the form of a dye. External conditions affected the pigment, the coloured particles altering their shape, and quickly changing the colour of the skin, as in the chameleon.

Most interesting examples of colour were found in very young animals. By studying them we gained information about adult colours. Animals are usually colourless in the earliest days of their existence. Amongst worms, insects, crustaceans, ascidians, fishes, reptiles, birds and even the highest animals there is a time when they are colourless and wormlike in form. The surface of the sea is a vast nursery for young creatures of various kinds exhibiting these characters. When, at a certain stage, colour appears, it is found to correspond to the form of the body. It occurs as repeated stripes or patches. A young cod, for instance, when three days old, is an insignificant eel-like creature, transparent and with four bold stripes of black on the sides of the body. These stripes later break up into spots. This spotted or striped character prevails amongst myriads of young animals. Wild pigs when young are

striped, the lynx is spotted, the lion-cub is spotted: but these marks disappear. They are of no use and simply persist as an ancestral landmark in each generation. In some striped creatures, the zebra, tiger and leopard, these external marks have proved of use and have persisted. Passing from ancestral coloration, Professor Prince referred to colours due to food, instancing the green oyster and the cochineal insect. Other colours may be called physiological, like the red or green colour of worms due to the hue of the blood. We have also emotional (cuttlefish); aesthetic (sex colours of birds, etc.,) and seasonal coloration. The stoat and hare turning white in winter illustrate the last. Parasitism furnishes strange instances, the green sloth owes its colour to minute algae which clothe the coarse grey hairs of that animal. Environment is most potent in causing animals to assume the colours of their surroundings. Insects afford striking cases. Strikingly tinted creatures such as the skunk, amongst quadrupeds, and the wasp among insects, exhibit warning colours. Mimicry is of great interest and there are many types, the most interesting being that of harmless insects mimicking poisonous or disagreeable kinds. Lastly, many colours appear, in our present state of knowledge, to have no useful purpose, and must be classed as indifferent. Interior organs and membranes are coloured in various ways for which no explanation is at hand. Why should the chimpanzee possess a palate of a bright rose colour, and the interior of the orang's mouth be black as ink? Much still remains to be done in this subject, and few subjects present more facts curious and interesting in themselves but also of far-reaching significance.

On conclusion a vote of thanks was moved by His Excellency the Governor General, who congratulated the Chairman upon having been able to secure the services of such an able man as the lecturer to discharge the duties which had been assigned to him by the Department of Marine and Fisheries. The motion was seconded by Sir James Grant, carried unanimously, and very suitably acknowledged by the lecturer, who then moved a very hearty vote of thanks to the Chairman, which was seconded by Dr. Sweetland.

ENTOMOLOGY.

Edited by J. FLETCHER.

THE SUMACH GALL.—Fine specimens of the curious and pretty gall which is sometimes found beneath the leaves of the Stag's horn Sumach, have been sent from Nictaux Falls, Annapolis county, N.S., by Prof. A. H. Mackay. This gall, which varies very much in size and shape, but is generally somewhat spherical and from $\frac{1}{2}$ to 1 inch in diameter, is formed by one of the gall-making plant lice beneath the leaves of both the Stag's horn and Smooth Sumach. The colour is the same as that of the leaves, and like the latter, turns to a brilliant scarlet in the autumn.

In the American Entomologist for 1869, Prof. Walsh says:—“Early in spring, as we have been informed by Dr. Manlius, each gall contains but a single wingless mother louse with numerous larvæ.” At this time of the year, when the galls drop to the ground, they are found to be little more than hollow bladders filled with enormous numbers of winged plant lice. Numerous specimens were collected at Kirk's Ferry last year and attracted much attention; some of the largest galls resembled small tomatoes. The insect which causes these curious excrescences is known by the name of *Pemphigus rhois*, and belongs to the Aphidæ or Plant lice.

EACLES IMPERIALIS.—I have received a specimen of this large and beautiful moth from Mr. T. W. Ramm, of Ross Mount, Northumberland county, Ontario, who writes as follows concerning its capture:—“I am not certain of the date, but it was at the end of June or the beginning of July, when I found two specimens of the Imperial Moth mated on a piece of an old log, on the side of the Port Hope and Peterboro gravel road, on Lot 35 in the 7th Concession of the Township of Hamilton. This is the last Lot, and the Concessions here number from the shore of Lake Ontario and are one mile and a quarter each. I had never seen the moth before, that I remember, in a residence here of 32 years.”

CATOCALA RELICTA.—Mr. Ramm also sent, under date of Sept. 18th, a specimen of the above named handsome moth, which he had taken two days before. The colouring of this moth is chiefly white, with a few black marks, and Capt. Geddes has recorded an interesting habit, with regard to this species, of settling on white trees or other white objects. He has taken several specimens at rest on the white

tomb stones in a grave yard. It has been found in this city upon white gate posts and fences.

ANISOTA VIRGINIENSIS, DRU. (*Dryocampa pellucida*, A. and S). -- Three pairs of this striking and rather rare moth have been taken during the past season. One perfect pair was taken by Miss Susie Almon, at the first excursion of the club, and kindly given to the leaders. The other two pairs were taken by Mr. Harry May and Mr. Harrington at Hull.

NOTES ON THE CATFISH.

During the past few months I have been closely observing the habits of the Catfish in my Aquarium. I find that these fish, during the day, lie comparatively quiet on the bottom, scarcely noticing food, unless dropped immediately before them, when they languidly literally bolt it, and again assume perfect indifference. As evening approaches however, they commence to swim about, frequently rising to the surface and drawing in air. This evidently is not from the absence of air in the water, or from impurity in the latter, as the same habits are noticeable even when the water has been changed, just before dark. This, I think, settles the fact of their nocturnal habits. The exception is on the approach of wind or a storm, when the catfish becomes very restless, swimming about frantically with no apparent object, and as restless as the eel is under similar circumstances. The same habit has been noticed with the leech, and they thus become one of Nature's Barometers. Another curious feature might be mentioned, that when the aquarium is exposed to continuous sunshine or bright light, the catfish assumes a light colour, the opposite being the case when in a dim light or darkened room. There is much yet to be observed in the habits of our fresh-water fish, of which we really know very little, from want of proper observation.

H. B. SMALL.

BOTANY.

HYPOPITYS LANUGINOSA, Nutt. Flowering specimens of this curious plant were collected at Kirk's Ferry, on 9th July last, by Mr. W. E. Saunders. This is the only place at which it has been found near Ottawa. J. F.

CORALLORHIZA STRIATA, Lindl. Several plants of this beautiful orchid were collected last spring at Beechwood, and in the woods at the back of Rideau Hall. The first specimen was found by the Hon. Archie Gordon. At the meeting of the Ottawa Electoral District Agricultural Society, on June 5th, a bunch of the flowers was exhibited which had been gathered from these woods by Master Symmes. The species is very rare in this locality having been found but once previously in the same wood. J. F.

PODOSTEMON CERATOPHYLLUS, Michx. One of the most interesting additions to our local flora, as well as to that of the Dominion, was made last August by Professor Macoun, in the discovery of large beds of the interesting River Weed. It was found growing on the bottom and creeping over the surface of the rocks in the rapids of Brigham's Creek, Hull, about 100 yards below the axe factory, and also further down the stream towards the Ottawa River. The description in Gray's Manual is an excellent one. There is only one species of the genus in Canada, which is a small ruddy or olivaceous plant of firm texture resembling a moss or sea-weed, which has no real roots, but is tenaciously attached to the bottom, loose stones, or other objects in the water, by fleshy disks. The leaves are rigid, dilated into a sheathing base with pointed stipules and above mostly forked into about 3 thread-like or linear lobes which are again divided once or twice. The flowers are very interesting, they are nearly sessile in a tubular sack-like involucre, and consist of two stamens, of which the filaments are united below, two sterile filaments, one on each side, and a stalked ovary which bears two awl-shaped stigmas. Flowers solitary and very numerous. The capsules are pedicellate, oval, 8 ribbed, 2-celled, 2-valved, seeds minute, very numerous on a thick persistent central placenta. J. F.

PHRAGMITES COMMUNIS, Trin. Specimens of this grass have been sent in by Mr. A. M. Campbell, of Perth, Ont., who was much struck with their beauty. He writes as follows:—"It is from the shores of Wicksteed Lake in the Temiscaming district. The Indian name for Wicksteed Lake is Shabasagi Lake, (river coming out on a point) and on the point where the inlet enters the lake grows this tall grass with its pampas-like plumes. I first saw this grass there last year, when we were surveying that lake. I also saw it in 1888 on the Lavase River, the

inlet of Lac Panache, District of Algoma. I cut specimens, this year, which measured 8 feet 6 inches in length and bore leaves 17 inches long. The stem was hollow and jointed like sugar cane; the joints were from two to eight inches in length. Towards the top the long, narrow, pointed leaves grew out of one side and the whole was surmounted by a tuft of purplish, oat-like seeds. On one specimen I noticed three tiers of aerial roots radiating from the first three joints above the root, there being one and a half inches between the first and second tiers, and four inches between the second and third. There were six roots radiating from each joint. It is certainly a very handsome plant and some of the ripe plumes were very silky and pretty. J. F.

This grass has also been collected by Rev. G. Bousfield, about three miles from Billings Bridge. The nearest point to Ottawa at which it had been previously collected was Casselman (30 miles).

CYSTOPUS ON CAPSELLA. It is a common habit now-a-days to look upon all fungi as injurious plants. A walk through a neglected garden at the present time will, however, discover one member of this large family doing good work for the cultivator. Shepherd's purse (*Capsella bursa pastoris*, Moench) is being freely destroyed by a form of mildew known as *Cystopus Canadensis* (P) Lev. Unfortunately, however, this disease does not confine its attentions to Shepherd's purse, but is frequently found on other members of the mustard family and is also a common enemy of grasses when grown in badly drained soils. J.C.

AFFINITY BETWEEN STOCK AND SCION In the development of new varieties the exact limit of possible hybridization is yet undefined; the same is true also when applied to the multiplication of the individual by the art of budding and grafting. There are in both instances—in the one the science, in the other the art—many gradations between failure and complete success.

In hybridizing plants, not nearly related, the pulp or receptacle of the fruit (seed) frequently or usually developes, but may, or often contains only infertile seed. Again, in the case of uniting the wood of two widely varying plants by grafting or budding, while the operation may appear to be entirely successful the first season, as judged by the growth of the scion, yet examination frequently reveals the fact that no real union of fibre has really taken place between the stock and the scion.

A case in point came under our notice recently in connection with experiments made in using the Bird Cherry (*Prunus Pennsylvanica*) as a stock upon which to grow cultivated forms. A number of varieties of the Morello, or sour type of cherry, were budded upon this stock, with every appearance of success the first year, many making a growth of three or four feet. The following season a few varieties made little progress and showed a tendency to break short off, under very slight pressure, at the point of union with the stock. Examination of the broken surface shows that there was no union of fibre, the surface being quite smooth, but merely by contact sufficiently close to admit the mechanical passage of sap. It also exhibits numerous lines or rays of fibre diverging regularly from the pith to the laburnum, and resembling the ordinary medullary rays but curiously multiplied. Under favorable circumstances, growth, or at least the life of the scion, might be maintained for some years by means of this connection, but vigour and longevity could not be expected. Bird Cherry as a stock shows a greater affinity for some varieties than for others.

While on this subject it might be stated that lilacs grafted on green ash (*Fraxinus viridis*) will grow vigorously the first season, but invariably die the second year. J. C.

GEOLOGICAL NOTES.

SAXICAVA SANDS AND GRAVELS AT CARP, ONTARIO. *Macoma fragilis*, Fabricius and *Saxicava rugosa*, Linnæus, both marine species of shells which are at the present day found living in great abundance in the Gulf of St. Lawrence and along the Labrador and general North Atlantic coast, were collected by me at Carp village station in the gravel pit immediately south of the station. Some fifteen feet of stratified sands and gravels are here exposed. The upper portion consists of coarse sands and gravels, of the ordinary type in this formation, whilst the lower portion reveals the presence of a considerable number of well rounded and water-worn pebbles; many of which vary in size from one inch to five inches in diameter. They are imbedded in a coarse matrix of sand and a number of accessories or impurities. These pebbles are for the most part derived from the crystalline limestone series of the Laurentian formations, probably of Archæan age. Pebbles of Chondro-

dite limestone are not infrequent, and are probably derived from the chondrodite limestones which lie to the north west of Carp station and the vicinity of Mississippi Lake. H. M. AMI.

PERSONAL NOTICES.

MR. LEHMANN. Two months ago we published a valuable and very readable paper on the manufacture of sugar from the cane, as practised in Louisiana, U.S.A., from the pen of Mr. Adolf Lehmann B.S.A, a member of the Club. As many of our readers know Mr. Lehmann personally, they will be interested to learn that he is now in Germany, prosecuting his studies in Agricultural Chemistry, with a view of taking the degree of Ph.D. For some years he was Assistant Chemist at the Central Experimental Farm, and in that capacity he did excellent work, all that he did being marked with thoroughness and ability. He then went to the Experiment Station at New Orleans, La., U.S.A., where, under the directorship of Dr. Stubbs he was especially engaged for a year and a half in the chemistry of sugar manufacture.

At Leipzig and Gottingen, Mr. Lehmann purposes making Bacteriology as applied to Agriculture, his special study. The Field Naturalists' Club wish him all success in his new field of labour. F.T.S.

MR. CARRINGTON. On October 17th some of the members of the Club had the pleasure of meeting Mr. J. T. Carrington, the well known English Naturalist who has just returned from Manitoba with Miss Winstone and Miss Flora Winstone, where they have been inspecting the working of the "Young Colonists' Aid Association." Mr Carrington is now the editor of that justly, very popular magazine, "Science Gossip" which has lately changed hands, and appears as a new series, in an improved form. Mr. Carrington was for 13 years editor of the English "Entomologist" and for many years was connected with the Natural History department of the *Field* newspaper. He is to have associated with him Mr. Edward Step, also an accomplished Naturalist. Mr Carrington made considerable collections of botanical specimens in different parts of Manitoba. While in Ottawa, the party visited the Departmental Buildings, the Experimental Farm and the Geological Survey. Mr. Carrington purposes to visit Canada again next spring, and we sincerely hope that it may be possible for him to attend one of our excursions. J. F.

A PROPOSED PHOTOGRAPHIC SECTION.

For some time past there has been evinced on the part of several of our members, the desire to form a photographic section in the Club. To put such on a good and firm basis, it would be necessary to obtain the names of at least twenty members who would be willing to pay a small annual fee, a fund being required to defray the expense involved in providing a dark-room, the use of certain chemicals and some preliminary instructions in the art and practice of photography.

With the exception of Ottawa, all our large Canadian cities have a camera club. The clubs have a large membership of amateur photographers and are generally in a flourishing condition. To keep up the interest an annual exhibition of work by the members is made. There is certainly a need of such an organization here, and all things considered, it would seem the better plan to form a section of the Field-Naturalist's Club for this purpose, rather than a new society.

Photography is not only an interesting and fascinating recreation, but a most instructive study, a study specially applicable to investigation in the various fields of Natural History.

We shall be pleased if those members who are wishful to form such a section of the Club will send their names to the Secretary, Dr. H. M. Ami, Geological Survey Department, Ottawa.

BOOK NOTICES.

One of the most interesting periodicals relating to scientific agriculture, which is received at this office, is the *Agricultural Gazette of New South Wales*. It is issued monthly by the Department of Agriculture of that colony; the subjects treated are always well prepared, carefully written and satisfactorily illustrated. While all departments are carefully edited, that relating to the field of botany is particularly interesting from an economic standpoint. We have before us the August number, and notice among the names of its contributors that of Dr. B. D. Halsted, Botanist and Horticulturist to the New Jersey Experiment Station. Dr. Halsted is known in Canada, but more especially in the United States as one of the foremost mycologists of the day, and an accepted authority upon cryptogamic botany.

“Club-Root of the Cabbage and its Allies” (*Plasmodiophora brassicæ*, Wor.) is the text of Dr. Halsted’s interesting article. The nature and history of the disease which causes the roots of cabbage to become distorted, and which belongs to one of the slime moulds, is clearly described, and the best course of treatment outlined. Some of the conclusions reached are as follows:—

“The malady is due to a microscopic parasite which infests the cells of the roots, causing them to become swollen and distorted.”

“The spores of the fungus, upon the decay of the part affected, become scattered through the soil, and from thence the enemy enters the plant.”

“The disease affects several plants of the cabbage family, including turnips, kale, radish, stock and candytuft.”

Among weeds, shepherd’s purse and hedge mustard are also infested.

“Preventive measures must be relied upon, for the affected parts of the plant are below ground, and not readily reached by any fungicide.”

“If the crop is diseased, all refuse at harvest time of roots, stems, and leaves should be burned.”

“All seedlings from hot-beds with signs of club-root should be destroyed, and if possible use only plants from beds in which there is no disease.”

“Cabbage, kale, brussels sprouts, kohlrabi, turnips, or radishes should not follow each other on the same land if club-root is prevalent.”

“Lime added to the land, 75 bushels per acre, has proved effective. It is possible that some commercial fertilizers may be found to check the trouble.”

“Keep the land free from shepherd’s purse and hedge mustard, and other weeds of the same family, as their roots become “clubbed” and thereby propagate the enemy.”

Among other articles of interest in this readable pamphlet, is one on the possibility of utilizing a native, and hitherto noxious weed, known as “Paddy’s Lucerne” or “Queensland Hemp” (*Sida rhombifolia*, Linn.,) as a fibre plant. Another describes “A New South Wales Bitter Vine” (*Piptocalyx Moorei*, Oliv.,) from which a drug of at present unknown properties is prepared.

The notes by consulting botanist J. H. Maiden "On Colonial Timber for Carriage-Building" are of much practical value, describing as they do the physical properties of many of the native woods, and giving their chief lines of usefulness. It is somewhat surprising to see the Gums (*Eucalyptus*) classed among hard woods, and recommended for cart and wheelwright's work, with the statement, that for such purposes there is "no timber to approach them." J. CRAIG.

WINTER MEETINGS.

The Soirée committee has almost completed the preparation of a programme for the course of evening meetings to be held during the winter, and it is promised that the Soirées will be exceptionally interesting. There will be a return in some measure to the procedure of the earlier years of the Club, and the course will be devoted entirely to natural history subjects. On December 6th it is proposed to hold a conversazione, when Dr. Dawson will deliver a brief inaugural address; the remainder of the evening being devoted to some interesting zoological subject. Then once a fortnight there will be evenings devoted respectively to Geology, Botany, Entomology, Conchology, Ornithology and Zoology. On each evening there will be two brief papers (not exceeding fifteen minutes) and the report of the leaders of the branch, with short notes which may be sent in by any member. Specimens will be exhibited to illustrate the proceedings, or when they are of exceptional interest. The committee again invites any member who may wish to contribute notes, or who desires to exhibit specimens, or otherwise assist in the meetings to communicate with Dr. Ellis as soon as possible. A complete programme will issue in good time. Ed.

JUMPING BEANS.

The Ottawa newspapers have recently had several notices of the arrival in the city of specimens of the so called "Mexican Jumping Seeds," and it may be of interest to give a brief description of what they really are. You all know the Codling Moth of the Apple, whose caterpillar injures and destroys so much fruit by making it wormy. Well the exact name of the appleworm is *Carpocapsa salitans*. The

plants infested by this insect in the United States are species of the genus *Sebastiania*, three in number, viz. *S. bicularis*, *S. palmeri* and *S. pringlei*, and it is found in California as well as in Mexico. The seeds in which the little grubs live, are about two-fifths of an inch long and subtriangular in shape; the two flat sides (where the seeds have pressed against each other in the ovary) forming a wedge, with the outer side rounded. The grub having fed internally upon the seed until nothing but a thin coated cell remains, lines it with silk and uses it as a winter residence. Before pupating it provides a way for it to escape from its prison when it becomes a moth, by partially cutting a circular hole through the wall and arranging an almost invisible trap door which may be readily pushed open from within. You have seen caterpillars lashing their bodies about when disturbed, and it is supposed that the jumping bear is knocked about by similar movements on the part of its inmate, who fastens the posterior extremity of his body firmly to the silken lining, and then dashes his head against the walls. By this means the seed may be rolled over or twisted violently around, or, aided by its shape, move about upon a flat surface in an apparently mysterious manner. The first specimen seen by me was one which Mr. Walter Odell kindly brought to me last winter, but it had apparently jumped itself to death. There are known to entomologists, other species of insects which produce similar movements in seeds. A more complete account of the insect may be found in Prof. Lintner's Fourth Report on the Injurious and other Insects of the State of New York, 1888, pages 151-154. Ed.

NOTE.--The Treasurer, Mr. A. G. Kingston (Public Works Department), again requests the attention of members, who have not paid their subscription for the current year, to the clause in the Constitution, which enacts that such fees are *payable in advance*.



SUMMARY

— OF —

Canadian Mining Regulations.

NOTICE

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode, or deposit of mineral or metal within the limits of the location of claim.

A location for mining, except for *Iron*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron*, shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended \$500.00 in actual mining operations on the claim, by paying to the Local Agent therefor \$5 per acre cash and a further sum of \$50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

Copies of the Regulations may be obtained upon application to the Department of the Interior.

A. M. BURGESS,

Deputy of the Minister of the Interior.

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