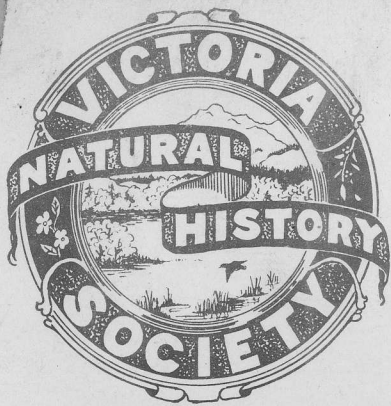


DECEMBER



The
**VICTORIA
NATURALIST**

1946



NESTING OF DOUBLE CRESTED CORMORANTS

BALLINGALL ISLAND, B. C.

THE VICTORIA NATURALIST

Published by

The Victoria Natural History Society

Vol.3, No.6

December 1946

At the November meeting of the Society, the speaker was Dr. R.M. Petrie, of the Dominion Astrophysical Observatory, who spoke on the above topic. The following is a brief account of the address:

Tides, which are of prime importance to navigators and to the commercial interests of ports, are of astronomical origin, and require the services of astronomers in their interpretation and prediction. They vary so greatly in various parts of the earth, and even within short distances, that generalization is impossible beyond the fact that most of the world has two high tides and two low tides per day, while the North Pacific violates even this generalization by having only one tide per day.

In very ancient times man recognized that the tides were in some way connected with the moon, but it was not until Sir Isaac Newton brought forward his theory of universal gravitation that any attempt was made to explain why or how they were so connected. Newton attempted to predict tides on purely theoretical bases, and failed signally. Later, the French mathematician, Laplace, achieved better success by combining theory with records of actual past tides.

Diagrams were introduced on the screen to illustrate the facts that both sun and moon exert gravitational forces which produce tides, although distance reduces the effect due to the sun to one third of the moon's pull. These forces alternately reinforce and oppose each other to produce succeeding "spring" and "neap" tides twice per lunar month. Due to the moon's revolution, each day's tides are about 51 minutes later than those of the previous day. Since the moon's orbit is elliptical, there is about 30% variation in the height of the moon's tide, while the eccentricity of the earth's orbit causes a 6%

variation in the tide due to the sun. The diurnal effect, which causes the single daily tide in northern waters, results from the fact that the moon's orbit is rather sharply inclined to that of the earth, so that at times the moon appears to circle the earth far north of the equator.

Tidal prediction is based upon the fact that although some thirty factors are involved, all of them are periodic. After observation of the tides at a given station for a year, the observed curve can be resolved into its component factors, which are then fed into a machine which can predict tides for that station for any year in the future.

Lake tides follow the moon from east to west, and are so small that they may be masked by local factors, that at Chicago being $1\frac{3}{4}$ ins.

The energy dissipated in friction due to tides on the earth is in the order of 2,000,000,000 h.p., of which three quarters is located in the Behring Sea. This energy is derived from the momentum of the earth, and its dissipation results in slowing the earth, thus lengthening our day by one thousandth of a second every century. The moon is correspondingly speeded up, with the result that its orbit is enlarged. After 4,000,000,000 years the day and the month will have the same value - 47 of our present days. Later, solar tides will slow down the moon and bring it closer to the earth until it is shattered by gravitational forces.

At Chicago, Prof. A.A. Michelson experimented with minute tides in a 500 ft. iron pipe. He obtained experimental proof of all the theoretical factors involved in tides, and also showed that the earth is slightly deformed by the gravitational pull of the moon, and possesses an elasticity comparable to that of steel and nickel.

Colin Curtis.

THE TENT-CATERPILLAR SITUATION FOR 1947

While no prediction can be relied upon as an indication of the Tent-caterpillar infestation in 1947 it may be of some interest to take stock of the present status of the species involved.

No factual record was made, by the writer, of the cocoon or adult population in 1945, a fact that makes a comparison with 1946 inconclusive. However heavy flights of the adults were very noticeable in the late summer of 1945, an indication that a high percentage of the comparatively few larvae seen reach maturity, no doubt from the absence of sufficient parasites to meet the emergency. It was also observed in 1945 that the egg clusters were exceptionally abundant on the food trees - quite enough for anyone to predict a great increase for the following year. This fact was amply demonstrated as all garden lovers know to their cost.

From the numberless hordes of caterpillars that were encountered everywhere during June and early July of 1946 comparatively few seem to have reached the cocoon stage. Aside from local destruction by mankind and other animals, parasitic insects and bacterial infestations undoubtedly destroyed vast numbers.

In the season 1946 the flight of adults was considerably less, while the egg clusters are not so evident in the locality under investigation, hence from this observation alone the infestation for 1947 is not likely to be as heavy.

As a check on these superficial observations several batches of 100 each of newly spun cocoons were studied in order to ascertain the probable number that would produce adult insects, especially females.

The average content of 100 cocoons was 21 larvae and 79 pupae. Of the 21 larvae, 12 had some form of bacterial disease while seven had dipterous larvae within them, leaving only two that might have reached adult stage. Of the 79 pupae, 26 contained dipterous larvae; two were diseased, leaving 51 healthy pupae. It will be noticed that very few of the larvae

with bacterial disease reached pupal stage. Thirty-three per cent of the cocoons contained possible parasites for next year's activities.

Allowing for a 50-50 proportion of males and females out of every 100 cocoons, 25 were likely to contain egg-laying adults. While this is a small proportion of the possibilities it is still large enough to give rise to a fairly heavy infestation in 1947. Each egg cluster may contain 150-350 eggs so that two caterpillars reaching maturity might easily replace 300 that have been killed by accident or parasite.

There is therefore every possibility of a fairly heavy infestation in 1947. Hand picking of egg bands during the winter months, supplemented by the destruction of the small webs, as they appear in the spring, should be attended to as thoroughly as possible.

The destruction of cocoons is not recommended, as it will be seen by the above that many useful parasites would be destroyed. Cocoons, however, could be gathered and placed in a close-mesh wire basket, which will allow the parasites to escape but would prevent the moths from doing so. These could be then destroyed.

Parasites will be abundant but the evidence of their control is not likely to be apparent until late in the year, if at all, as far as the immediate season is concerned, for as will be seen a large number of larvae remain active up to pupation despite the presence of the destructive parasite within them. The result of parasites is most noticeable in the following year by the great reduction of numbers of the egg-laying female moths.

Two species of Tent-caterpillar are represented in the Victoria district, the Orchard Tent-caterpillar, Malacosoma disstria v. erosa, and the Forest Tent-caterpillar, M. fluvialis. The former prevails over most of the area; the latter appears later in the season and may be predominant in some regions, as at Swan Lake in 1946.

George A. Hardy,
Provincial Museum.

GOPHER PROSPECTORS OF ELK RIVER

The valley of the Upper Elk River extends some 40 miles northerly from Michel on the Crow Nest branch of the C.P.R.

Fording River, the main branch, begins in the Rockies and flows parallel to the Elk River, joining it south of the Green Hills. The area lying between the Elk and the Rockies on the east (including Green Hills) ranges in elevation between the valley at 5000 ft. and the highest mountains of 8000 ft. The coal measures occur east of Elk towards the Rockies and the seams of coal which are of interest are at some 6000 ft. elevation.

A rough wagon road is built up the Elk and trails lead up the several tributary valleys.

The valleys are well wooded and the higher slopes bare.

The coal seams occur in thickness of from one to twenty feet. Exposures of the seams may be seen and measured in the narrow creek valleys cut down the hillsides. A good deal of prospecting has been done by the C.P.R. and other companies, and the extent of the field is well known. In 1909 the Provincial mineralogist made a trip over the country to report on the situation.

Apart from technical studies, on such trips notes are taken on various subjects of interest. Part of the area covered consists in hillsides and rounded summits standing above the timber line. Here the surface is formed of weathered sandstones and shales of the coal measures. This surface is covered with a growth of grass and flowering plants, concealing the character of the broken material beneath.

Inhabiting such country is the ground squirrel, or gopher, properly known as "Citellus Columbianus". In colour it is a yellowish brown, the upper surface of the thighs and the

hind feet and face being brick-red, while the lower parts are buff, with the sides and rump flecked with grey. The length is about 345 millimeters.

The citellus excavates a burrow about 4 in. across and two feet deep in the soft material. Here and there much larger pits may be seen. These are formed by the action of bears which try to dig out the gophers.

Prospectors wishing to ascertain the possible extent of an ore deposit, evidence of which has been discovered, trench and dig pits in all directions. Here the gopher comes in very useful. He makes his burrow in the ground, throwing out the waste as a dump. The dump, seen from a little distance, shows up well the character of its material.

The coal in this particular area is in seams from a few inches to several feet in width, in light coloured sandstone. So by looking at a hillside pocked by burrows, the outcrop of a seam is easily seen and recorded.

This is only one of many instances where nature has something to show the observant prospector seeking mineral deposits.

H. Nation.

REPORT OF THE THIRD ANNUAL FUNGUS FORAY

Fourteen members attended this meeting at the Hudson's Bay woods on Oct. 19. Despite an unfavourable season, over forty species were obtained.

Of special interest was the cauliflower fungus, Sparassis crispa, growing at the base of a fir tree. Others include the Scaly Pholiota, Pholiota squarrosa, on decaying balsam trees, the fine showy Pholiota, Pholiota spectabilis; the Oyster mushroom, Pleurotus ostreatus on Garry oak; the novel Globe Polypore, Cryptophorus volvatus on old fir trunks; the Deer mushroom, Pluteus cervinus on rotten logs. The velvety caps of the Scotch bonnets, Marasmius bellipes occurred in small groups on the forest floor or on logs, where also were found the Red-

juiced Mycena, Mycena haematopoda, and dense colonies of the Little Bell mushroom, Omphalia campanella. Here, too, the horse mushroom, Agaricus arvensis, reared its massive head, while here and there specimens of the following species were noted, - Earth Star, Geaster hygrometricus; the Puff-balls, Lycoperdon pyriforme and L.gemmatum; Lactarius subdulcis, with "milky" juice; Collybia albipilata growing only on old Douglas fir cones; the Honey fungus, Armillaria melleus; the Tufted Yellow Mushroom, Hypholoma fasciculare; the Crested Lepiota, Lepiota cristata; Clitocybe piceina; C.nebularis; Paxillus involutus; C. infundibuliformis; the Golden Chanterelle, Cantharellus aurantiacus; the Painted Polypore, Polyporus versicolor; Polyporus Schweinitzii; P.hirta; P. brumalis; Polysticus perennis; Xylaria Hypoxylon; Fomes pinicola; Ganoderma applanata; Russula marie; Tremellodon gelatinosum; Stereum hirsutum; Mycena galericulata; Stropharia semiglobata; S.appendiculata; Gystoderma amianthinum; Agaricus placomyces; Coprinus atramentarius and a number of other species not determined.

While this is a comprehensive list, the number of individuals of a given kind was very small, requiring careful search for those above noted.

Last season (1945) over sixty species were obtained and these were represented by innumerable specimens that littered the terrain in a bewildering plentitude.

George A. Hardy,

Provincial Museum.

BIRD GROUP MEETING

Winter group meetings are not generally reported in the Naturalist, but we feel that a brief report on the bird meeting held on November 5th, at which Dr. Carl spoke on the birds of the Pribiloff Islands, may be of interest to those members who were not present.

"It is estimated that 137 different species of birds visit the islands and 23 breed there. Of these latter 16-20 breed there regularly. Twenty or more of the visitors are Eurasian. Four birds of the Pribiloffs are found no where else. These are the Rosy finch; the wren; the snow bunting; the sandpiper. Of these the wren is found only on St. George Island. The native name for it means "a chew of tobacco". The Pribiloff sandpiper has a different call from all other sandpipers.

The most numerous species seen there is the murre. It nests on narrow ledges, one egg per female. To obtain fresh murre eggs to eat, the native first removes all eggs and throws these away, then returns a week later to collect the new batch of fresh eggs.

Two kittiwakes are common there, the black and the red legged species.

Three auklets are there, parroquet, crested (like a California quail), least. The last is used by the natives for food. They nest under boulders inland. They are so numerous that they can be caught in nets as they fly in over the cliffs to their nests in the evenings. Foxes line up under the telegraph wires to catch the birds that get hit by the wire. The least auklet lives on crustaceans and anthropods.

The red-cheeked cormorant is common on the islands. The longspur found there is a very good singer and behaves like a skylark. It is very common and nests all over the islands. The snowy owl is fairly common and there are innumerable ducks especially the eider duck.

R.G. Hobson.

MARINE BIOLOGY ILLUSTRATIONS Continued from Vol.3,#5:ANIMALS:

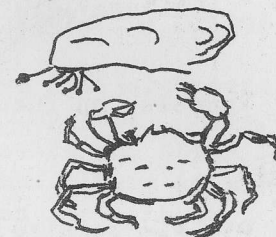
Gobies, Sculpins



Barnacles



Mussels. Note holding threads.

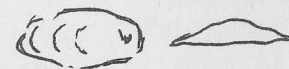


Shore crab, under stones.

Hermit crab, in old shells.



Limpets.



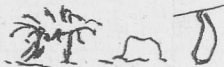
Starfish, six-rayed. Under fucus.



Periwinkles.



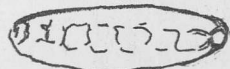
Anemones, under over-
hanging rocks or in
cracks.



Sponges--Haliclona,
purple, encrusting
rocks.



Armadilla shells
(Chitons).



Isopods, on fucus.



ZONE III

Plants: Usually larger and better specimens of the same species mentioned for Zone II but occasionally the red algae will be found.

Animals:

Turtle Crab



Blenny



Clingfish



Vermilion starfish.



JUNIOR MEMBERS' PAGE

Hallo Juniors:

October 26th, the first meeting of the season, was on "Corals and their Relatives". I was not present so can tell you little. Some are very beautiful, they are built up by little worms you can hardly see.

We were also told about the competition for the best drawing of the season. One prize was given by a lady before leaving for England, the other by the Society for the Preservation of Native Flowers.

On Nov. 2nd, Dr. Carl gave us a lecture on "Molluscs", he told us to draw pictures of some of the clam family for the competition.

There are two lovely books for prizes, I know we will all try to win them.

Nov. 9th, this week we nominated candidates for the Junior offices for the coming year. Afterwards we went to the cases where the fossils and shell are kept and had a lecture on star fish. There is a beautiful collection of starfish prepared for schools. There are 4 or 5 types of actual starfish, sea-urchins are one kind, believe it or not.

Nov. 16th. This week we voted for the offices and those elected were: Chairman, Ronald Forbes; vice-chairman, Alan Watson; Secretary, Brian Ainscough; Bulletin Editor, Carol Stevens; Past Chairman, Keith Duncan.

Then we had a lecture on crabs, a barnacle is a member of the crab family. Mr. Hardy showed us stages in the life of a barnacle; how it gets its food, etc. After shedding its skin several times it begins to get the shape of the inside of the barnacle, as it gets heavier it cannot swim so it sinks. It finds something firm to attach itself to, and a sort of cement comes from its mouth. It catches its food with long sweeps which you see waving above the barnacle.

Carol Stevens.

NOTICE OF MEETINGS

1946

MONTHLY MEETING

Tuesday

Dec. 10th: The monthly meeting will be held in the
 Provincial Library at 8 p.m.
 Dr. Carl will speak on the
 "Seals of the Fribiloffs".

NOTE TO JUNIORS

If any junior has interesting nature
 notes for the junior's page will they
 please give or send them to Carol
 Stevens, Junior Editor.

We take this opportunity to wish all the members of
 the Victoria Natural History Society a very Happy
 Xmas, full of good health and good cheer.

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The multigraphing of this magazine, since its inception,
 has been done by Monks' Multigraph Letter Service of
 604 Fort Street, and we feel we cannot see this year
 depart without a word of praise for the efficiency and
 promptness, as well as courtesy, with which our work
 has been executed.

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David Anderson

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