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Shaggy mane.

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The Cut-throat Trout

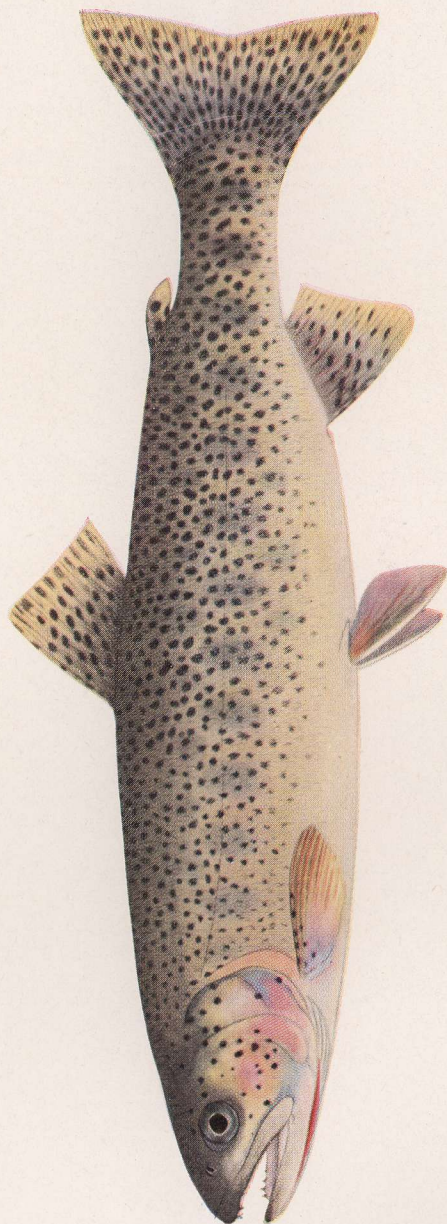
The favorite game fish of coastal lakes and streams is the native Cut-throat trout. In practically every water system from southeastern Alaska to northern California this fish is found. It is particularly abundant in streams and lakes of the British Columbia coast where access to the sea is provided. While it is essentially a fresh-water species some members enter the salt water at various seasons but always return to a stream or lake for spawning.

A typical cut-throat trout is easily recognized; the main features are the long jaw extending to a point behind the eye and the characteristic red mark on either side of the throat from which the fish gets its common name. Often this "cut-throat mark" is very faint or lacking, especially in individuals residing in salt water, making it necessary to examine the tongue for positive identification. In the cut-throat there are teeth on the back of the tongue; in the rainbow, the only other species with which it may be confused, these teeth are absent.

The food of the cut-throat trout varies with the size of the fish. Those less than six inches long feed almost entirely on insects, both aquatic and terrestrial; larger trout take fish such as sticklebacks, salmon and trout fry and kokanee when available. During the salmon-spawning season, eggs are also consumed by this trout. In general cut-throats feed upon fishes more than do other species of trout.

To the sportsman the cut-throat is of great value as a game fish but according to some it is not the equal of the rainbow, steelhead or Kamloops in fighting ability.

G. C. C.



COASTAL CUT-THROAT TROUT.
Salmo clarkii clarkii Richardson.

The Shaggy Mane, Coprinus comatus Fr.

Members of the mushroom family are rarely seen during the long summer days in the vicinity of Victoria, but soon after the warm autumnal rains bring welcome moisture to the parched earth the fungi spring up all around us seemingly from nowhere, causing not a little speculation as to their origin.

The Shaggy Mane (cover picture) is no exception to the rule of a mushroom's sudden appearance, for it will often poke up in most unexpected places, such as the hard-packed borders of roads or in the middle of a tennis-court.

At first, the cap of the Shaggy Mane is soft and fluffy, like a small closed parasol of daintiest form, with ruffly scales all over its surface. Very soon this attractiveness disappears as the gills wilt and blacken at the lower edges, exuding drops of an inky fluid. This dissolution spreads upwards until all that is left of the once handsome cap is a mere blackened knob at the summit of a scrawny stem.

In the Shaggy Mane the spores on the closely packed gills mature in progression commencing at the lower end, the cap gradually expanding until it assumes a horizontal position. As the spores fall away the now useless part of the gills are subject to a process of disintegration, in this way removing what would otherwise be a hindrance to the free escape of the spores above. In the last stage all the gills have been thus disposed of. The final curtain to the Shaggy Mane is decayed by putrefaction in the normal way.

As a result of this deliquescent process the Shaggy Mane and related species are often known as the Ink Fungi or Inky Caps. A very good and durable ink can be made from some of the species; the addition of a preservative such as oil of cloves prevents the formation of mould.

The Shaggy Mane is of frequent occurrence in the Victoria district. As the mycelium exists until the

food supply is exhausted, it may be found in the same localities year after year. The continuance of the species is assured by the spores which are constantly settling on new sources of food for a future generation. As it has been estimated that over 5 billions of viable spores can be produced by one cap, the chances of survival seem to be fairly well assured!

The young caps make a most delectable article of diet and are much sought after by those who have once partaken of them. They may easily be cooked by steaming for 5 minutes then served with butter or cream, or if a more substantial meal is required, place alternate layers of chopped caps, bread crumbs and grated cheese, add pepper and salt and few small lumps of butter, then bake for 15 - 20 minutes. G. A. H.

Ornithology Group Outing, June 4th

During a General Outing to Thetis Lake on June 4th members of the Bird Group observed the following species: Western tanager, song sparrow, robin, warbling vireo, russet-backed thrush, pileolated warbler, yellow warbler, Western flycatcher, solitary vireo and olive-sided flycatcher.

The following members were present: J.O. Clay, Miss Eugenie Perry, Mr. and Mrs. Gordon Olding, Mrs. Parris, Miss Parris, Miss Caldecott, Mrs. Weir, Mr. and Mrs. Adshead, Miss Collen, Miss Reid (guest), Mr. and Mrs. Stewart, Mr. and Mrs. George Hardy, Miss McDonald, Miss M. Goodeve, Mr. T. Taylor, Mr. Dimoline, Mrs. Baile and Mr. Nutt.

M. Eugenie Perry.

Botany Group Outing, June 4th

Those members interested in the plant growth at Thetis Lake on the occasion of a general meeting on June 4 were well rewarded for their efforts to attend. At this season of the year the early rush of spring flowers was on the wane but yet vigorous enough to make a good showing in some shady places, while the more seasonal dry area plants were just showing up or were in their prime.

Some of our seemingly common plants are quite handsome when seen en masse as was noted by the banks of palest pink blooms of the Small-leaved Spring Beauty, Claytonia parvifolia, or by the vivid yellow of the Stonecrop, Sedum spathulifolium on the dry rocky slopes. On these same bluffs the beautiful Farewell-to-Spring as the Godetia, Godetia gracilis, is sometimes poetically called, displayed the vivid pink flowers in marked contrast to the browning grasses among which it grew. Here also the pretty Gilia heterophylla showed its tiny yellow-centered pink blooms doing its share to brighten up its arid vicinity. In more shady places, the dainty long-styled bells of Scouler's Campanula showed among the luxuriant herbage that draped the woodland banks. The dogwood, thimbleberry and Soapollalie each in turn gave glimpses of their own particular charms, while the flaming red bloom of the Columbine, Aquilegia formosa, added a more colorful note.

On the steep banks of the trail the graceful racemes of the Alum root, Heuchera micrantha, added a lightsome touch to the solid rock among which the plants grew, while here and there among the grassy terraces masses of the Bird-foot clover, Hosackia parviflora, thrived in terms of green and white.

To do justice to the wealth of flowering plants that greeted the eye of the nature-lover on this occasion would take up more space than is available but I think that we all thoroughly enjoyed the opportunity to see at first hand so many of the native floral gems that it is the privilege of Victorians to possess.

G. A. Hardy.

SAPROPHYTES AND PARASITES AMONG THE HIGHER PLANTS

By William T. Tildesley

The expression, "All flesh is grass", has become somewhat cliché because its fundamental truth is obvious but if one added, "some grass is also other grass", it is probable that most people would wonder what you were driving at. Yet there exists a considerable group of seed plants that are directly or indirectly dependent on other plants for all or part of their sustenance. Some of these have completely lost the power to develop chlorophyll and therefore lack the ability to manufacture their own food from sunlight. Others vary from the mistletoes which have a slight green tinge to the Indian paint-brushes which seem to develop a normal green leaf structure, but are still parasitic on the roots of other plants.

When a plant has lost the power to manufacture its own food there are two alternative sources available, other living organisms or dead ones. Plants may be classified, therefore, according to the food source.

Saprophyte -- is the name given to a plant which obtains its sustenance from dead and decaying organisms. A plant that is completely dependent upon this source of food is called an "obligate saprophyte". A plant which is partially saprophytic and which can exist when dead material is absent is called a "facultative saprophyte".

Among the seed plants species of the latter group are not easily recognized because it is difficult to determine whether the material in which the plant is growing forms part of its food supply or whether it is just the soil and climate that determines its location. For instance, the pink lady's slipper (Calypso bulbosa (L) Oaks.) is often found under broad-leaved maple, and seems almost nontransplantable but it has a good green leaf and seems quite capable of supporting itself under the right conditions. Local climate and the acidity of the soil are probably more important to it than the break-down products of the species under which it grows.

Obligate saprophytes do not invade living tissue but they are indirectly dependent on other plants for the preparation of their food. After a plant dies it must first be broken down and reduced to its original simple ingredients before it is available to the saprophyte and it is only through the work of the soil fungi and bacteria that this is possible.

The only obligate saprophytes that I am familiar with in the Victoria district are the coral root Orchids (Corallorhiza) and the Indian pipe or ghost plant (Monotropa uniflora L.). The coral roots are rather cheerful looking plants with a simple spike of spurred flowers, brightly colored but small at the top of a single stalk. The leaves are reduced to sheathing scales around the lower part of the stem which is generally of a brownish purple or red. The most interesting feature of this genus is the presence of branching coral-like underground growths at the base of the plant. These structures, from which the plant gets the name "coral root" or Corallorhiza are not roots at all but underground stems.

The Indian pipe or ghost plant (Monotropa uniflora L.) is completely without color its vestigial leaves forming a decorative trimming of white scales for its slender stem. In the quiet shade of coniferous woods from Newfoundland to Vancouver Island one finds small groups of these delicate looking little plants, each with its thin, lightly scaled stem standing straight with the single nodding flower bending over to make the bowl of the pipe. Although "Indian pipe" is a good descriptive name, I myself prefer the name "ghost plant" for when I come across a colony of them in deep shadow with their pale ethereal beauty they appear to me as the ghostly spirits of our primeval forests, wrecked and destroyed by the hands of unthinking men.

When Monotropa matures it turns black and the flower straightens up while the capsule hardens, so that the numerous seeds will not fall before they are ripe.

During their lifetime all seed plants go through a period of both parasitism and saprophytism. This is during the development and germination of the seed itself. When the pollen tube grows down to the egg cell a new generation is begun and the development of the seed to maturity is a form of parasitism in which the mother plant is the host and the developing seed is the parasite. When the time comes for the seed to germinate it goes through all stages from a complete saprophyte to an independent (autotrophic) plant with chlorophyll. When conditions of temperature and moisture are such as to encourage germination the reserve food supply of the seed is changed to a form that the embryo can use and until the plumule has unfolded and exposed the seed leaf it is entirely dependent on that reserve. When the leaves begin to develop chlorophyll, the plant's dependence on the reserve supply of food becomes less and less so that it passes through this stage as a facultative saprophyte until it is completely independent.

There is another group of plants that are very interesting in that they use animals as a supplementary source of food. As they are not dependent upon this source, they cannot be called saprophytes so they have been labeled "Mixophytes". Plants of this group include the insectivorous species of which we have a few in British Columbia. For about a month now Mr. Hardy has specimens of the sundew (Drosera rotundifolia L.) in the showcase at the entrance of the museum. This tiny bog plant has sticky hairs on the surface of its leaves and when an insect lands on this surface the two sides of the leaf come together, the captured insect is digested and the leaves open again. Probably the best known of our insectivorous plants is the pitcher plant (Sarracenia sp.) which is not found in our area. There is another whole family, the Lentibulariaceae, which take part of their food in the form of insects and one genera which goes fishing for small crustacea right in the water. These latter are the bladderworts (Utricularia) of which we have four species. These plants grow in streams and lakes and have quite conspicuous yellow flowers with a noticeable spur at the back. The

leaves are immersed and bear little bladders which have a valvular lid. It is in these bladders that the plant catches the minute aquatic animals with which it supplements its diet. Members of another genus of this family, the butterworts (*Pinguicula*), do not have noticeable bladders, just a swelling of the stem, but they catch insects on their thick slimy leaves. Our only species is the common butterwort (*P. vulgaris* L.) which George Goodlake collected at Banff this summer. It is blue-flowered and grows in damp ground. Our "animal-eating" plants are not spectacular but they make an interesting change from common rule of "animal-eaten" plants.

In a future issue of the "Naturalist" I expect to write something about the parasites among the seed bearing plants.

Report of the September Meeting

Following the adoption of the minutes of the previous regular meeting and the reading of two items of correspondence the following new members were introduced: Miss E. G. Duer, Mr. Alex C. Harris. It was announced that the programmes were available for the Audubon Screen Tours; copies were on hand for distribution.

Following the short business session an account was given by G. A. Hardy, C. J. Guiguet and G. C. Carl of the Museum's recent visit to Triangle Island condensed as follows:

Report on Triangle Island

Triangle Island, the outermost of the Scott Islands, is situated about 40 miles northwest of Cape Scott, the northern tip of Vancouver Island. The greatest depth of the intervening water is about 300 feet. The island is about one mile long, from point to point, and three-quarters of a mile wide, with precipitous slopes and rocky shoreline. In 1913 a

light station was established on the island but it was abandoned in 1919 because of the difficulties encountered in servicing.

Many of the plants found there are also found on Vancouver Island but they are of essentially woodland species despite the absence of trees and despite the exposure to heavy winds. The soil is loose and moist; the most conspicuous flowering plant was the cow parsnip while common ferns included lady fern, deer fern, wood fern and bracken. A large proportion of the island is covered with an extremely dense growth of stunted salmonberry pruned waist high by wind and interspersed by dwarfed crabapple. Figwort reaches its known northern limit of range here.

The island is noteworthy because it provides the only known nesting site in Canada for California murre and supports what is perhaps the largest colony of tufted puffins in British Columbia. One of the largest colonies of pelagic cormorants is also found here. The most numerous sea-bird present is the Cassin auklet whose burrows were found in all suitable parts of the island. Other breeding birds present were glaucous-wing gull, black oyster catcher, guillemot, bald eagle, Peale's falcon, winter wren, sooty fox sparrow, russet-back thrush, and dwarf hermit thrush. Crows and ravens were not present.

White-footed mice (*Peromyscus*) and meadow mice (*Microtus*) were each represented by a giant undescribed race characterized by having a white spot on the forehead. Steller's sea-lions had rookeries on several rocky islets not far off shore.

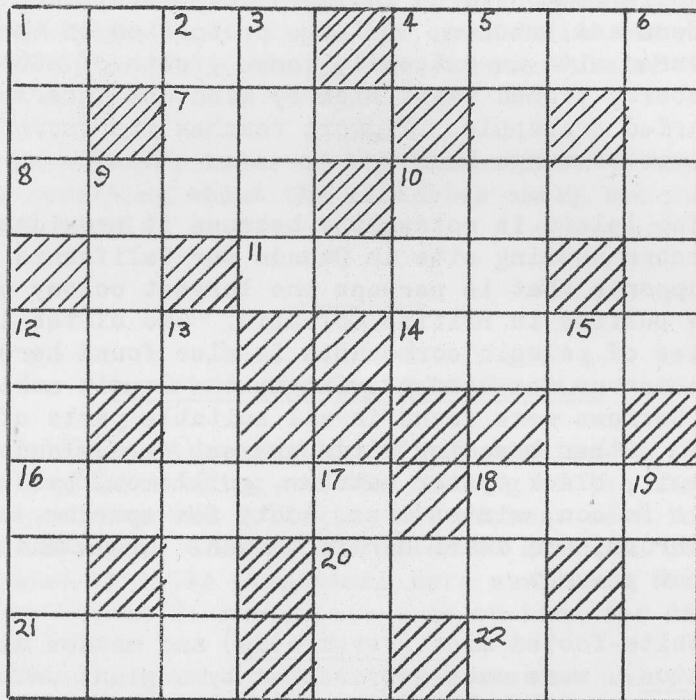
Specimens of plants, birds and small mammals were passed around for examination after which a film was shown featuring the bird life of the island.

G.C.C.

JUNIOR PAGE

Hi, kids!

Here's an animal cross-word puzzle for you to work on. The member who sends the nearest correct answer to the Museum office before October 31 will receive a copy of a bird picture painted by the late Major Allan Brooks. Let's see what you can do.

Across

1. A bird found in Beacon Hill Park.
4. A fish much like a trout.
7. Lubricant.
8. A tailed amphibian.
10. Found under stones on the beach.
11. A young bird (This is hard so we tell you what it is--
EYAS)
12. A baby bear.

14. A bird like a small gull.
16. A wild pig.
18. Insect from which we get honey.
20. A new Zealand parrot.
21. Donkey.
22. Ox of Tibet.

Down

1. Lion's home.
2. Animal which provides us with food and drink.
3. A kind of hawk; something which can be flown in
the air.
5. Animal used for pulling a "Tally-Ho".
6. A common bird; many stay in Victoria all winter.
9. A large flightless bird of Australia.
10. A feline pet.
12. A hooded kind of poisonous snake.
13. Animals which chased Goldilocks.
15. Fish eggs.
17. Where to look for a kind of lark found only in
Victoria.
18. Chestnut-coloured horse.
19. Largest species of deer.

Try making up a cross-word puzzle yourself using names of animals and plants. Send it to the Junior Editor; best ones will be published.

The Humorous Side of Nature

A heron disturbed from his reveries by a rude interloper flew away to the other side of the lake, and landed with considerable force on the end of a small floating log on which four or five mallard ducks were enjoying a siesta. On the impact the log upended throwing the ducks into the water much to their obvious indignation, as they scrambled back to resume their rest.

G.A.H.

NOTICES OF MEETINGSNote about Junior Meetings:

Dr. Carl will be away all October visiting Children's Museums and others in the east so the first Junior Meeting will have to be postponed until Saturday morning, November 12th, in the Museum. See you then.

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1949

- Tuesday General Meeting in the Reading Room of the
 Oct. 11: Provincial Library at 8 p.m. Speaker: Mr. George J. Alexander, Deputy Minister of Fisheries, with a new film, "Let's Go Fishing".
- Saturday Annual Fungus Foray: Meet at 2 p.m. at Mt.
 Oct. 15: Tolmie bus terminus. Bring container for specimens and own refreshments if desired. Mr. George Hardy.
- Tuesday Botany Group Meeting in the Provincial
 Oct. 18: Museum at 8 p.m. Mr. W. T. Tildesley.
- Wednesday Audubon Screen Tour at Prince Robert House
 Nov 30th: Auditorium at 8 p.m. The first tour of the season with Bert Harwell and his film "Canada West".

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New Group Proposed:

It is proposed to form a new group in the field of archaeology. Will those persons who would be interested in taking part in such a group please leave their name with Mr. Tildesley?

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To