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# THE VICTORIA NATURALIST



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COVER PICTURE

By David Stirling

COVER STORY: SEA STARS

By Wayne Campbell and David Stirling

Sea stars, probably the best known of seashore animals, can be found in many places; in tide pools, behind seaweeds, sometimes on sandy beaches but most commonly in rocky areas.

Most sea stars have five arms or rays and resemble stars; others may have twenty or more rays. Some are small, barely two inches across, and others may be several feet across. Most are brilliantly coloured.

Look closely at a sea star's back and you will see a little round plate. Water is filtered through this plate or madreporite in order to inflate the suction-tipped tube feet. By regulating the amount of water within each tube foot the animal is able to move about.

Now look underneath. The groove running down the middle of each ray is filled with tube feet. The mouth is at the centre of the sea star. Sea stars are carnivorous animals feeding on clams, oysters and mussels. They obtain their food by gripping their prey with their tube feet and exerting a steady pull until the shell opens. Then a sac-like stomach is pushed out through the mouth to digest the meal.

Sea stars can replace damaged or lost parts by simply growing new ones, a process known as regeneration.

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The above is reprinted from a 4-page Nature House leaflet Sea Stars put out by the Parks Branch, Department of Recreation and Conservation. With 13 drawings by Dorothy Taylor, and short notes on each of the 13 sea stars illustrated, this leaflet should be useful to many members of our Society.

Editor.



ON HARBOUR SEALS (Phoca vitulina)

During the seven years my family lived on Race Rocks, we observed many animals and some of their stranger habits.

One incident that really made us take notice was when a harbour seal displayed quite startling intelligence. This seal was a distinctively marked individual among the many often around the station.

The seal fished mainly among a group of rocks under our kitchen window. We saw him almost every day. Once we saw him do something I have not seen before or since.

He had caught a fish and, after swimming up current of one of the channels between the rocks, he dropped a large chunk of his meal back into the water. The ebb tide carried it down between the rocks where it was watched closely by the seal as it tumbled along the bottom.

When the seal judged it to have gone far enough, he dived, retrieved it, and swam upstream to repeat the procedure. Altogether, the seal did this four times.

The only logical conclusion I can draw from the seal's behaviour is that, perhaps by accident, he had learned to use a primitive fish lure, even though it had not been successful this time. Allowed to drift by the cavernous mouths and ever-empty bellies of the lingcod on the bottom, such a chunk could easily cause the fish to move after it. The seal on the surface would thus only need to watch and wait - much easier than nosing around under water trying to find fish that were trying to hide from him.

The seal, therefore, used a modified natural object to aid him - he used a tool.

I don't think we need to look for intelligence only among the stars. We could do with a kindly second look at some of our cousins who have taken the road back to the sea.

K.C.R.Cehak

FOR THE PRESERVATION OF DOCUMENTARY PHOTOGRAPHS

At the December General Meeting, David Stirling told new members that a new method of handling bird records has been proposed in Audubon Field Notes. (February, 1968, Volume 22, #1)

Briefly, it requires that: (1) photographs of rarities, new nesting records, etc. be submitted to a National Photoduplicate File so that these records can be made available to all students of ornithology. (2) Record photographs be submitted to regional editors of Audubon Field Notes for publication in the Field Notes and for verification of sight records.

Material submitted should be 35 mm slides (black and white or colour) or prints (black and white or colour). The size of such prints should not exceed 4 x 6 inches.

As a regional contributor to Audubon Field Notes and co-organizer of the British Columbia Breeding Bird Census, David Stirling is interested in getting this worthwhile project started for the Victoria area and perhaps for all British Columbia. Contributors should submit material in triplicate; one copy to go to the National Photoduplicate File; one to Field Notes for possible publication, and one to a Vancouver Island Bird Record File which David Stirling will organise.

Only current photographs can be used in the Audubon Field Notes but pictures of rarities of past years are wanted for the National File and Local File. Photographers should submit information as to species (Common name and scientific name), age and sex if known, locality, date and photographer. David Stirling will set up and complete the 3 x 5 inch record cards.

Members who are interested in this programme for the preservation of documentary photographs would certainly be interested in the February, 1968, article in Audubon Field Notes. (Volume 22 #1)

Editor

SNAGS

A tree that has ceased to grow in the forest is called a "snag". If it has lost its bark it is a "Buck-skin snag". If it is growing singly, it should be left standing as it is a natural part of the living forest and performs a useful task.

Such snags are feeding stations and homes for many living creatures including some plants. They become infested with many insects whose job is to help break down the snag so that it will provide material for new growth. Thus, within the old wood, you may find many kinds of beetles such as bark, borer, stag, fir, flat back and often the predator beetles.

Then there is the carpenter ant, the carpenter bee and, perhaps, the wild honey bee. In summer the hornets may find a home there, too. Where the wood is damp termites move in and make their galleries, and before the bark drops off there are many other little creatures in the cracks and in the lichens. Spiders find the snag a good hunting ground.

You will find many kinds of fungi growing on the old trees. Each kind of tree will have its particular species of fungus. Each tree has its quota of mosses and lichens. Some may have ferns growing there, too.

In time, the snags become building and nesting sites for many birds such as woodpeckers, nut-hatches, house wrens, chickadees, brown creepers, owls, blue birds, tree swallows and the beautiful wood ducks.

Squirrels may make a nest in the deep holes. Raccoons may live there and, close to the ground, there may be a field mouse.

Some of the birds feed on insects and so provide a check to hold the balance. If snags are cut down, the birds cannot reach the "food" on the underside. With a natural check thus removed, the insects may increase too much and eventually spread to living trees and destroy them.

Snags are also "observation posts" from which hawks and eagles may survey their territory. Nests are often built on the top of snags. These nests provide a clear "landing" as the birds bring food for their young.

A snag is a community in itself, and, in turn, is a part of the living forest community.

Silhouetted against the sky, a snag can be beautiful.  
Freeman King.

BOOK NEWS FOR NATURALISTS

November additions to the stock of the Greater Victoria Public Library were:

Beet, E.A.	Astronomy old and new
Moore, P.A.	Naked eye astronomy
Romer, A.S.	Procession of Life
Colbert, E.H.	Men and Dinosaurs
Van Wormer, J.	World of the Canada Goose
Davies, D.G.	Fresh water
Wilson, C.M.	Roots
Brockman, C.F.	Trees of North America
McMillan, I.I.	Man and the Californian Condor
Willis, W.E.	Timber from forest to consumer
Kramer, J.	Rare orchids everyone can grow

List supplied by G. McBride,  
Circulation Department, G.V.P.L.

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The November 6 issue of the Province, Vancouver, reported that logging crews are getting ready to move into Glacier National Park. At stake are six timber berths consisting of 35,000 acres of virgin timber. Five of the berths are owned by Kicking Horse Forest Products. The sixth, the most controversial and that which runs along both sides of the Trans Canada Highway for more than a mile, is held by Selkirk Spruce Mills Ltd. of Donald.

E.J.Gondek, general manager of Selkirk, said the negotiations have broken off as far as he is concerned.

"These trees are getting past their prime and too much land is being set aside just to lie down and rot", Mr. Gondek is quoted as saying.

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### PLANNING FOR LEISURE

How much use can an acre of woodland support before its ground cover is destroyed forever? How many tents can a strip of beach support before its potential for bathing is gone? How many parked cars can a campsite sustain before the surrounding trees and vegetation are affected beyond repair?

The answers to these questions and others like them are being sought at the University of British Columbia. A two-year project which UBC's planning school will embark on will relate the increasing pressures for outdoor recreation placed on a rapidly-urbanizing area and the natural environment's capacity to sustain intensive human use.

For UBC now has a recently established resource sciences research group in the faculty of graduate studies, headed by Dean Ian McTaggart Cowan. The multi-disciplinary group includes the disciplines of forestry, zoology, ecology, agriculture, economics and planning. In the broadest sense, the group hopes to study the impact of man on his physical environment. Its establishment is the result of the Ford Foundation Grant mentioned on page 35 of our November magazine.

"More and more people", says Dr. Peter Oberlander, director of UBC's school of planning, "also care very deeply about the scarcity of outdoor recreational space and its allocation on a regional basis. A good current example is the Roberts Bank-Boundary Bay controversy where there is a conflict between industrial utilisation and recreational facilities".

The UBC planning school, with a grant received from the Toronto-based Donner Canadian Foundation will try to discover criteria for space standards for outdoor recreation.

The project will attempt to test its observations and criteria for space standards in the context of recreation opportunities in the Gulf and San Juan Islands. This resource, says Doctor Oberlander, will serve as an outdoor laboratory for the test phase of the Donner project and UBC will have the active cooperation of the department of urban planning at the University of Washington in the project.

The two schools have agreed to an even longer-range joint programme of teaching and research within the context of the common coastal region stretching from the Seattle-Tacoma area to British Columbia's Sunshine Coast.

### BIRDS FOR THE RECORD

by G.N. and G. Hooper, 2411 Alpine Cr. (477-1152)

Lincoln's sparrow (2) - Ascot Drive -	Nov.16 -	Allen Poynter
Rough-legged hawk (1) - Martindale Road -	Nov.16 -	
Golden eagle (1 imm.) -		
Goshawk (1) - Pat Bay Hwy. and Martindale	Nov.17 -	Ralph Fryer, Mr. & Mrs. R. Mackenzie-Grieve
		Ray Beckett
Gyr Falcon (1) - Martindale Road -	Nov.19 -	
Peregrine falcon (1) -		
Water pipit (100) -		
Mourning dove (10) -		Tuesday Group
European widgeon (1) - Shoal Harbour (Sidney) -	Nov.23 -	A.R. and Eleanore Davidson
Western bluebird (8) - Markham Road -	Nov.24,25 -	
Common teal (1) - Interurban Road -	Nov.24 -	
Gray partridge (8) - Pat Bay Airport at Mills -	Nov.24 -	Ray Beckett
(Hungarian)		
Bonaparte's gull (4,000) - Oak Bay -	Nov.26 -	Allen Poynter and Cy Morehen
Rough-legged hawk (1 imm.) - Welch Road -	Dec. 1 -	Ray Beckett and Enid K. Lemon
Sabine's gull (3) - Clover Point	Dec. 3 -	
Black-legged kittiwake (3)		
Northern fulmar (1)		
Bonaparte's gull (500) -		Ralph Fryer
Canada Goose (minima) (1) - Elk Lake	Dec. 7 -	
(Cackling)		A.R. and Eleanore Davidson

### \*\*\*\*\* ADDITIONAL SHOWINGS OF AUDUBON WILDLIFE FILMS:

The remaining three films in the series will have showings on Friday and Saturday nights as well as an additional Saturday matinee at 2.30 p.m. The matinee is to accommodate the many people whom we had to turn away from the first two films.

Because of the large attendance, season ticket holders for evening performances are asked to be in their seats by 7.50 p.m. as requested on their tickets.

### SOME SEA STARS

The 4-page leaflet, Sea Stars, put out by the Parks Branch has notes on the thirteen sea stars drawn by Dorothy Taylor on pages three and four. Although not to scale, the drawings give a good idea of the variety of shapes and sizes to be found in sea stars.

1. Purple Star, Pisaster ochraceus - 5 short, thick rays broad disc - spines form a network - purple or dull ochre 6 to 14 inches across - mainly intertidal - commonest sea star.
2. Pink-skinned Star, Pisaster brevispinus - 5 thick rays - velvety appearance - dull pinkish-rose - to 2 feet across - restricted to deeper waters - occasionally hooked by fishermen.
3. Mottled Star, Evasterias troschelli - 5 long, tapering rays - small central disc, round - blue-green or grey - 8 to 14 inches across - exposed at low tides - common.
4. Long-rayed Star, Orthasterias koehleri - 5 long, slender rays - small humped disc - dark red or grey - to 15 inches across - mainly subtidal - not abundant - spines in 5 or more indistinct rows.
5. Blood Star, Henricia leviasscula - 5 slender tapering rounded rays - red-orange or blood red - 2 to 8 inches across - intertidal to deep waters - quite common.
6. Leather Star, Dermasterias imbricata - 5 short rays - broad disc - smooth skin - reddish brown - to 10 inches across - intertidal in sheltered bays - abundant.
7. Red Star, Mediaster aequalis - plates along the edges of the rays - orange-red - 4 to 6 inches across - intertidal to deep waters - common.
8. Broad-disk Star, Patiria miniata - 5 "web-footed" rays - crescent-shaped plates on the surface - yellow to dull orange - to 6 inches - restricted to deep waters - common, usually collected by scuba divers.
9. Six-rayed Star, Lepasterias hexactis - 6 rays - dull green on top, pale yellow below - 2½ to 3 inches across - intertidal - common, often clustered together under rocks.

10. Rose Star, Crossaster papposus, - 10 to 12 short rays - skeleton forms a network - bright pink on a creamy coloured background - subtidal - not common.
11. Sun Star Solaster stimpsoni - 10 tapering rays - broad disk dull, blue-gray, bordered by pink on each ray - 3 to 6 inches across - exposed at minus tides - not common.
12. Red Sun Star, Solaster dawsoni - usually 12 slender rays - disk wider than ray length - above uniform dull red, below dull yellow - to 14 inches across - subtidal; occasionally seen intertidally - not common.
13. Sunflower Star, Pycnopodia helianthoides, 18 to 24 rays - soft body - mottled gray with salmon pink background - largest sea star - exposed at low tides - common.

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### FROM GUIDE TO COMMON SEAWEEDS OF BRITISH COLUMBIA.

In this British Columbia Provincial Museum handbook No.27 Dr. Robert F. Scagel states that the first man to collect marine algae in this area was Archibald Menzies. It was not until the middle of the 19th century that the first comprehensive collection was made between 1859 and 1861 by David Lyall, a medical officer, in the vicinity of the British naval base at Esquimalt, British Columbia. It comprised 100 species (from the same general area about 500 species are now known).

EDITOR'S NOTE. Although January is not the best month for poking about our beaches, this material about sea stars and seaweeds is presented now so that members may, if they want, do some quiet reading during the winter months. The usual list of the summer's lowest tides will be given in March or April. The increase in small boats, marinas, scuba and skin diving, the talk of a national marine park and of off shore mineral rights, the growth of underwater photography, all make it reasonably sure that more and more British Columbians will become interested in the natural history of their varied and considerable shoreline. We shall not labour the point in the magazine, but it would be pleasant to show the young that the treasures of the beach are not just broken glass, sewage and plastic containers.



BEFORE MAN

As I write these lines it is early autumn - a time to wonder at the many and wonderful ways nature has for dispersing the tiny germs of life - the seeds and spores on which depends the continuity of each plant species. Have you ever stopped to think how many kinds of seeds are moved by methods that nature had long ago, but which man has discovered and turned to his purposes only in recent times.

Possibly most obvious are the beautiful "parachutes" of the dandelion, salsify and others of the Daisy family. We have all seen these fly past, but take time next summer to examine them closely. Better still, photograph or sketch them. Only with close examination can you appreciate the intricacies of their designs. While the "parachute" system is in general use in the Daisy Family, and variations of it occur in others, it must surely reach a peak of development in the two plants named. Surely the efficiency of these parachutes must be linked closely to the obvious widespread success of these two plant wanderers.

(Man has invented a practical parachute only within the past sixty years, and ours still serves but to check a long fall - we cannot use it to travel on the breezes).

Spring-loaded catapult systems are another device that nature has had for a long time. We see them locally in cranesbills, geraniums, brooms and others. Here again close observation can be both entertaining and instructive. Choose a hot day when the broom is ripe and watch and listen closely. You may be surprised at how far the seeds are shot! (Man used spring catapults as weapons some 2,000 years ago. The Romans had a military device, the ballista, and, in the Middle Ages, there were several variations of the same principle. Of these, the crossbow is perhaps the most familiar).

Somewhere along in their course of development, many unrelated plant species have evolved elaborate systems of advertising and packaging that induce their "customers" of the animal kingdom to accept their "product" of seeds and, incidentally, to aid in dispersing these seeds. The "advertising" is evident in the brightly coloured fruit, and the "packaging" in the tasty pulp in which the seed is "wrapped". The berried plants are our most obvious examples. The high mobility

given these plants by the animals which help carry their seeds makes these species successful as early members of the plant successions on land recently cleared by fire, flood, landslide or logging. In some instances the plants and animals are so interdependent that one would have difficulty without the other.

Our advertising and packaging reached its flamboyant stage within the memory of many of us. Plants were experts in the field hundreds of thousands of years ago.

J.E.Underhill

VOLUNTEERS NEEDED FOR WORK AT THE MUSEUM: Volunteers are asked to lead school children through exhibits depicting the history of man, plants and animals with particular reference to British Columbia. Training will be by a short course of five sessions. These will be held twice a week starting on January 16. Specialised knowledge, though welcome, is not necessary. You need simply a desire to learn and teach. The Museum Staff intends to use specially picked docents in an exploratory program for the Blind. Children will be encouraged to handle and discuss mammals and bird specimens, as well as Indian relics. Besides teaching, there is a need for typists, for those interested in photography, hospitality, filing and cataloguing and, finally, for salespeople on the Publications Sales Counter.

If you are interested or want further details, phone the Volunteer Chairman, Mrs. Flo Scaplen 382-6111, local 3575.

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JUNIOR JOTTINGS

As the winter creeps up on us now, sometimes the weather isn't too encouraging for outdoor hikes. But the weather hasn't daunted us much so far.

The Juniors had an interesting excursion to Craigflower Creek where they examined the many lichens and fungi brought out by the late fall rains. Next weekend the Intermediates enjoyed their exploration of Thetis Lake which included finding many early plants well advanced in growth due to recent weather conditions. The following weekend was cold and rainy so the Juniors spent an afternoon at Foresters' Auditorium at Francis Park, where they identified specimens and learned about them in their natural environment.

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Jane Moyer





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