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(See also inside back cover)

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THE VICTORIA NATURAL HISTORY SOCIETY

VOL. 31, No. 5

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THE WILD RESOURCE - TO USE OR NOT TO USE?
THAT IS THE QUESTION

by Alan Austin

PART II

Notwithstanding the remarks I made in the first of these two articles regarding the relative wisdom of using 'wild' and 'tame' biological resources, there can be little doubt that if a wild resource has some utility and value to our human society attempts will be made to harvest or collect it and to obtain a profit by so doing; this, to use commonly used but impossible to define terms, is 'human nature' or 'the economics of the situation'.

It is not surprising that we have a good deal of marine algae or seaweed along the coastline of B.C. The linear dimensions (approximately 450 miles) of this coastline are considerably magnified (to 17,000 miles) by the intricate dissection of numerous large fjords, and by the presence of innumerable islands, and this productive area is further influenced by tides of relatively large range or amplitude, meaning that there may be extensive intertidal areas which are the most productive regions of the littoral.

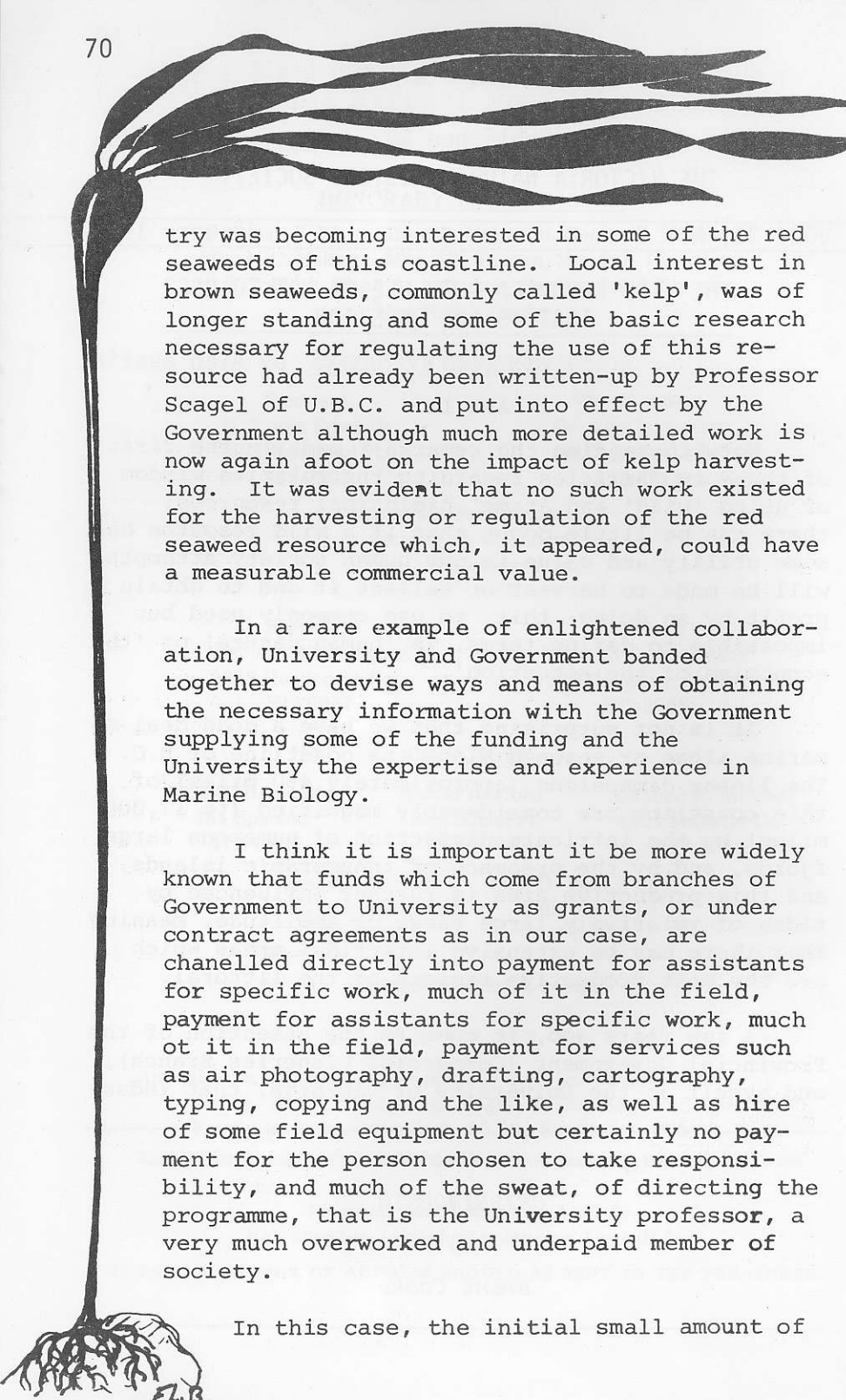
A few years ago, it came to the attention of the Provincial Government (Commercial Fisheries Branch), and myself at the University of Victoria, that indus-

Cover photo - an anemone of the genus

CRIBRINOPSIS

by

Brent Cooke



try was becoming interested in some of the red seaweeds of this coastline. Local interest in brown seaweeds, commonly called 'kelp', was of longer standing and some of the basic research necessary for regulating the use of this resource had already been written-up by Professor Scagel of U.B.C. and put into effect by the Government although much more detailed work is now again afoot on the impact of kelp harvesting. It was evident that no such work existed for the harvesting or regulation of the red seaweed resource which, it appeared, could have a measurable commercial value.

In a rare example of enlightened collaboration, University and Government banded together to devise ways and means of obtaining the necessary information with the Government supplying some of the funding and the University the expertise and experience in Marine Biology.

I think it is important it be more widely known that funds which come from branches of Government to University as grants, or under contract agreements as in our case, are channelled directly into payment for assistants for specific work, much of it in the field, payment for assistants for specific work, much of it in the field, payment for services such as air photography, drafting, cartography, typing, copying and the like, as well as hire of some field equipment but certainly no payment for the person chosen to take responsibility, and much of the sweat, of directing the programme, that is the University professor, a very much overworked and underpaid member of society.

In this case, the initial small amount of

money enabled a competent student-assistant to be employed for a few months in order to start literature research and feasibility studies on the approach to a programme of examining the biology of the particular plants in which industry was showing interest. May I explain the use of the word "biology" here - it means a "total" study, a total exploration of the organisms concerned. Shakespeare I think expressed this better when he said "I have to know thee all before I understand thee a little" or words to that effect.

The foundations for a long-term far-reaching study were thus laid, although they soon had to be bent somewhat towards the pragmatic purposes of ascertaining the "where" and "how much" of the commercially valuable plants occurring along our coastline.

Methodology for this sort of survey did not exist which gave us the opportunity to explore various basic methods of surveying beds of seaweeds of this particular sort, which I should remind you are smaller and far less obvious than the large brown kelp which have already been surveyed and in use for some time.

Certain quite large areas - one length of coastline surveyed was 30 miles long - were chosen and methodology employed involving airphotography and ground-truth surveys by teams of biologists with SCUBA to check the size of beds of weeds. Such work resulted in maps of marine vegetation which we believe are not equalled, at least for such relatively large areas of coastline. There certainly are much smaller areas (we have them ourselves) which are mapped in greater detail, and there are far larger areas mapped in less detail, but whilst acknowledging concurrent work elsewhere we feel that for sea shores of the extent of those we have mapped, we have made the most detailed and most comprehensive marine vegetation maps to date.

The interim and annual reports submitted to the Government on this work have been very well accepted

and the grants have been extended into the fourth year. During this time we have moved from an inventory or survey of 'what is there' and 'how much' to a consideration of the effects of harvesting the plants and of how quickly the vegetation regenerates. We are now moving into studies which we believe might be the most important aspect of this work. Namely to ensure the resource becomes self-sustaining, and one in which utilization has a minimum environmental impact.

And here we come full circle to my earlier remarks. The wild resource is present, in some places, in harvestable quantities but in other places in irregular amounts which probably could not be harvested under almost any foreseeable situations. We have the task of converting this wild, fragile and vulnerable resource into a cultivated and rather more controllable or predictable one with which we have at least some measure of assurance with regard to crop, with regard to renewal and with regard to confidence in its future. However, the picture is not as simple as it sounds or as simple as our agricultural technologists have apparently seen it, but let me return to our work for a moment.

We have not overlooked "ecological impact" during the present study and are attempting to pay more and more attention to the aspect of effects on other organisms with the inevitable sequel of subsequent effects via these other organisms on man's 'interests'.

There has already been a checkered history of kelp harvesting, there is now a growing history of sea-urchin harvesting and we have oyster and shellfish harvesting as well as, of course, a long history of fishing the shallow waters of the globe. Thanks to academic ecologists many people are now aware of some of the undesirable side effects of much of this harvesting of wildlife resources. It is hoped that like the presently reported waters the enlightened, early co-operation of Government and the independent University team working together to reach an adequate understanding of the particular

natural systems in which the resource organisms occur will ensure the latter's maintenance into the indefinite future, and might lay a baseline for similar studies of other similar, and dissimilar, resources.

Perhaps more valuable even than a well-documented picture of a given resource organism or group of organisms our findings, and maps in particular, will serve the vital function of a base line for the monitoring of changes or perturbations that might occur in B.C. coastal waters.

Aquatic vegetation, carefully mapped and adequately recorded can be used as an accurate mirror to reflect a very wide variety of alterations originating either from the sea - oil spills, marina development, dredging operations - or from the land such as sewage effluent, rivers bringing in pollutants and even land washoff from construction. It will be exciting and no doubt revealing if we can return to our mapped coastlines say 3, 5, 10 or 15 years from now and ponder the resulting comparisons across such periods of time and 'progress'! But will this be possible? It is both regrettable and of serious concern to me to have to say "probably not"! The climate necessary for the University worker to follow work of a long-term field-oriented nature is no longer with us, however vital or socially important he may consider the work. Much of the university teachers' very existence, in terms of space and facilities not to mention personal situation in terms of wages, is dependent upon 'papers' published. Papers to an administrator are 'titles' - whether they represent 4 or 40 or 400 pages, whether they are the result of a few days' experiment and calculation in a laboratory or of months or years of painstaking work combating the complex logistics and weather restrictions of working in the field. The result is a 'fashion' which deems it 'advanced' to chase molecules in the apparent pursuit of some easy elixir whilst we lose perhaps not yet recognized organisms, fellow components of our earth space ship life system to the

inexorable scythe of 'necessity' or 'progress' or economics or something similarly named.

This leads me to my very final point, one which I doubt can be reached by the study of units smaller than the community of organisms as they occur in situ and undisturbed, i.e., in Wildness (Thoreau's use of the word). How often do we question the influence of selection of species, their breeding and their cultivation and harvesting - i.e., agricultural technology - upon our total global 'life-system'. Agriculture admittedly sustains us, but can we believe it necessarily does it the best way? By ordering the biological future of other forms of life we alter our own. When agricultural practice decides, often with substantial arrogance, to adopt, or even create, a given plant or variety of organisms and cultures to the exclusion of all competitors - often pushing these other so-called 'useless forms' to extinction by all-out chemical warfare - we risk the extinguishing of species, the value of which we may never know until they are in fact not there any more. Species which may function as stabilizers in natural communities are eliminated and we may have to pump in energy, in the form of biocides and other preventatives, to retain the balance or stability of the agricultural system. Such systems are sometimes called 'monocultures' and are inherently unstable but are nevertheless rather simple and profitable. The alternatives - the culture and cropping of more complex systems consisting of a number of species, each supportive of the others - is largely ignored by agricultural science; these systems are sometimes said to be 'un-economic'!

Perhaps frustratingly to the get-rich-quick types but fortunately for many of us, in the water or aquatic systems the maintenance of monocultures is more difficult than on land. In water the whole environment is an even more tightly interconnected and interrelated 'whole'. If we wish to crop our shallow marine waters we may have to learn more of the complex 'polycultures' that exist there in the

first place and this imperative will hopefully result in our understanding enough about wildlife to enable us to encourage these sorts of communities and enhance their growth and productivity. The latter may not be as simple as a 'tame' or cultivated resource, to which we might first have to resort for some time - but in the end it may be that the answer to the question in my title, "The wild resource - To use or not to use?" - will be "Yes!" - When this 'wildness' is better understood and appreciated - and Thoreau would again be prophetically right.... "In Wildness is the preservation of the World".

* * * * *

Herewith follows what both the author and your editor hope will become a regular feature of The Victoria Naturalist and one which will add a new dimension to your enjoyment of natural history - a column on the wonders of the skies. Leading off this month is a general outline of what to expect in January's heavenly pageant but the future may see us delving into almost any facet of man's interest in the sky. We also hope that you may have a question or two about the stars and their companions that could be answered in these lines, so, without further ado, we present

David Stirling
and
THE SKY IN JANUARY

On this, my first venture into space with the Victoria Naturalist, I would be pleased to report that there will be many spectacular sights in store for us this month. Unfortunately, it appears that January, 1975, will be a rather ordinary month - no total eclipses, flaming comets or meteoric showers.

But the heavens will not be without some interest for the amateur sky-watcher. In late January, Mercury, never a bright object, will be visible an hour after sunset, low in the southwest.

Venus will also be visible close to the sunset and to Mercury. Mars will just manage to get above the eastern horizon before the sun causes the stars to disappear, and Jupiter will be in the western sky, setting about four hours behind the sun. Of all the visible planets this month, Saturn is certainly the finest. With binoculars or a small spotting scope you may obtain a good view of this planet's amazing rings which are "wide open" because Saturn has a strong tilt at this time. This allows us to see the flat surface rather than the edge of these shining, concentric belts. Look for Saturn in Gemini, the Twins.

If this month will not produce too much excitement for the average star-watcher, there will be something for the astronomer. Eros, one of the small planets that orbit between Mars and Jupiter, will be making one of its close approaches to the earth. Eros, just a chunk of irregular barren rock, tumbles end over end on its journey around the sun. Sky-watchers will be made aware of the path of Eros on the night of January 24 when it occults Kappagem-inorum, a star almost as bright as Polaris, five degrees south of Pollux, twin of Castor. In other words, Eros will come between K. and us shutting off K.s light. A patient watcher will see K. dim out, disappear for possibly twenty minutes and then re-appear again. Research scientists at the University of Victoria will be observing this event with interest as the occultation will help them to learn more about the shape of Eros.

The constellations of winter are at their best in January but, unfortunately, between overcast skies and city light reflections, most of us won't have a chance to appreciate these beauties unless we make special effort. On clear nights the hill-top lookouts beyond the city area are good places for star-watching. And you people who go skiing or visiting in the interior of the Province - you have a wonderful opportunity to enjoy the splendour of the heavens.

More next month.



BIRD REPORTS

by Jack Williams

We have such a mixed bag this month so I think we'll list them in AOU order.

Eared Grebe (1)	Nov. 16	The Goodwills and Ron Satterfield Clover Point
Whistling Swan (4 adults)	Nov. 24	Jack Williams Willows Way Trail
" (1 adult)	Nov. 21	The Goodwills Sooke River
" (2 adults)	Nov. 23	Vic Goodwill and Ron Satterfield Sooke River
Trumpeter Swan (2)	Nov. 21	The Goodwills Sooke River
Canada Goose (49)	Nov. 16	Jack Williams Munro Rd.
White-fronted Goose (1 Imm.)	Nov. 18	Vic Goodwill Victoria Golf Course
Snow Goose (1 with 50 Canadas)	Nov. 13	The Goodwills Flying over Fairfield
" " (1 with 17 Canadas)	Nov. 17	C.E. Rushton East Sooke
Gadwall (6 males & 3 females)	Nov. 11	Ron Satterfield Quick's Pond
" (1 male)	Nov. 24	Ron Satterfield Beacon Hill
" (1)	Nov. 26	Ralph Fryer Colquitz River
European Wigeon (3)	Nov. 11	Ron Satterfield Panama Flats
Wigeon (hybrid)	Nov. 11	Ron Satterfield Beacon Hill
Wood Duck (6)	Nov. 16	Vic Goodwill and Ron Satterfield Cowichan Ponds

Barrow's Goldeneye	Nov. 12	Peggy Goodwill
(1)		Finlayson Point
" "	(5) Nov. 30	Jack Williams
		Bazan Bay
Oldsquaw (175)	Nov. 22	Jack Williams
		Sidney Wharf
Ruddy Duck (36)	Nov. 18	Jack Williams
		Bazan Bay
Turkey Vulture (1 flying)	Nov. 26	The Goodwills
		Esquimalt
Golden Eagle (1)	Nov. 9	Vic Goodwill
		Martindale
Marsh Hawk (1)	Nov. 16	Vic Goodwill and Ron Satterfield
		Cowichan Bay
Peregrine Falcon (1)	Nov. 16	Vic Goodwill and Ron Satterfield
		Cowichan Bay
Sandhill Crane (1)	Nov. 13	Chauncey Wood
		Swan Lake
" "	(1) Nov. 26	Jack Arnaud
		Swan Lake
Virginia Rail (1)	Nov. 14	The Goodwills
		Rithet's Bog
Spotted Sandpiper	Nov. 21	The Goodwills
(1)		Whiffen Spit
Greater Yellowlegs	Nov. 17	Jack Williams
(22)		Robert's Bay
Long-billed Dowitcher (1)	Nov. 18	Vic Goodwill
		Victoria Golf Course
Common Snipe (21)	Nov. 11	Ron Satterfield
		Martindale
" "	(11) Nov. 30	Ron Satterfield
		Martindale
Parasitic Jaeger (1)	Nov. 1	The Goodwills
		McMicking Pt.
Western Gull	Nov. 5	Ralph Fryer
(7 imm.)		Clover Point
Black-headed Gull	Nov. 13	Peggy Goodwill
(1)		Clover Point
Little Gull (1)	Nov. 7	Ralph Fryer
		Clover Point
Heerman's Gull (1)	Nov. 23	Vic Goodwill and Ron Satterfield
		Becher Bay

Sabine's Gull (1)	Nov. 7	Ralph Fryer
		Clover Point
Rhinoceros Auklet	Nov. 11	Ron Satterfield
(1)		Clover Point
Snowy Owl (1)	Nov. 8	Ron Satterfield
		Pat Bay Airport
" "	(1) Nov. 28	Marion Allen and Rick West
		Gordon Head
Short-eared Owl (1)	Nov. 9	Ralph Fryer
		Vic. West
Lewis Woodpecker (1)	Nov. 16	Betty Lothian
		Arbutus Rd.
" "	(1) Nov. 2	Ralph Fryer
		Beacon Hill
Dipper (1)	Nov. 24	Jack Williams
		Butchart's Gdns.
Long-billed Marsh Wren (1)	Nov. 11	Ron Satterfield
		Quick's Pond
Hermit Thrush (2)	Nov. 1	Ron Satterfield
		Mt. Douglas
" "	(1) Nov. 24	Ron Satterfield
		Goldstream
Mountain Bluebird	Nov. 16	Vic Goodwill and Ron Satterfield
(1)		Cowichan Dist.
Water Pipit (25)	Nov. 24	Jack Williams
		Willows Way Trail
" "	(11) Nov. 13	Ron Satterfield
		Clover Point
Cedar Waxwing (35)	Nov. 1	Jack Williams
		McTavish Rd.
Northern Shrike (2)	Nov. 25	The Davidsons
		McHugh Road
Hutton's Vireo (1)	Nov. 26	Rob Mackenzie-Grieve
		Prevost Hill
" "	(3) Nov. 16	Vic Goodwill and Ron Satterfield
		Cowichan Dist.
Western Meadowlark	Nov. 3	Joan Groves and Betty Parlow
(8)		Oak Bay Golf Course
" "	(15) Nov. 30	Ron Satterfield
		Martindale

Rusty Blackbird (1 imm.)	Nov. 11	The Davidsons McHugh Rd.
Lark Sparrow (1) at feeder	Nov. 4	Wayne Campbell Cadboro Bay
Snow Bunting (3)	Nov. 13	Anne Knowles Clover Point
" " (1)	Nov. 23	Vic Goodwill and Ron Satterfield Whiffen Spit

The Mountain Bluebird sighting was unusual being later than usual. And Wayne Campbell's Lark Sparrow could be the same bird returning to his feeder for the third year in a row. With the Terns all departed for points south, the Parasitic Jaeger seen November 1 must have had to look to other bodies to bother.

It was good to hear that Lewis' Woodpeckers were being seen again in Victoria, now if they'd only decide to nest here again.

Among the raptors reported this month were several sightings of both Sharp-shinned and Cooper's Hawks, 7 reports of Merlins (mostly from around the airport), 1 Kestrel and 3 Bald Eagles. The November 26 Turkey Vulture seems to be on the late side.

The Swan Lake Sandhill Crane was still around at time of writing. Could it manage to stay until the Christmas Count?

In the duck department the 9 Gadwall at Quick's Pond on November 11 is a new high for this species in our area and the 175 Oldsquaw off Sidney on the 22nd, while no record, is still a significant congregation.

Your compiler saw 20 Black Turnstones in Sidney recently which really isn't new but these turnstones were doing their stone-turning in a parking lot. A high tide at the time, when beaches were covered, forced the birds to seek the next best thing.

And just to prove you have to think positive... every time my wife and I go to Butchart's Gardens

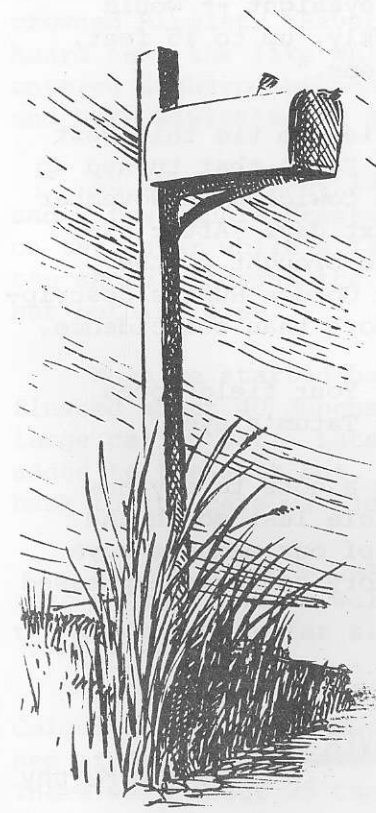
in winter we always say there should be a Dipper in the little stream. We tried again this month. After searching the stream thoroughly and almost ready to admit defeat again, there was the bird sitting on a stepping stone in the star pool. We watched it from 15 feet (4.57 metres - you might as well get used to it) for 10 minutes. He was still there when we left so our motto for today: Never give up!

* * * * *

FROM THE MAILBOX

The Gospel according to the Victoria Naturalist is spreading, if this month's mail means anything. For example, there was the note from Kay Johannes of Whitehorse - that's the Yukon Whitehorse - to the effect that our new cover is just great. Good to hear from you Mrs. Johannes. I'm sure our readers would like to hear more about things natural up Whitehorse way.

Then there was another note, this one with a Port Alberni postmark. It turned out to be from Gordon Hunt of the Pachena Point Light-station and was a real blockbuster containing news of yet another (?)



Cattle Egret. I'll let Gordon tell the story -

"CATTLE EGRET - 10:45 to 12:50, Nov. 21, 1974, on lawn and perched in various locations as close as 40 feet. Viewed with 7x50 binoculars and telescope. Clear weather.

Small, about 20-24 inches high; all white plumage, yellow bill with dark tip, eye yellow with black pupil. Long toes and first section of tarsus black; "knee" and above, yellowish-green. Fringe-like beard extending half-way onto lower mandible. Stood with neck and head tucked in. Flight similar to herons': feet dangling behind, head tucked onto shoulders, and with broad wings. Perched from low vantage point or stalked slowly over lawn hunting insects. Jabbed at prey with bill in the manner of a heron. Seemed to have good eyesight -- would change direction and walk quickly, up to 15 feet, to grab prey on several occasions."

I wouldn't blame you if you tried to tie this West Coast bird with another Cattle Egret that turned up at Eric Allan's farm near Lake Cowichan on November 25 and which died there the next day. After examining the carcass, which Eric brought to the Provincial Museum, and reading Gordon Hunt's description, the similarity is just more than coincidence.

Thanks for the report Gordon. Your field notes brought tears of joy to Jeremy Tatum's eyes.

David Stirling also dropped us a note to say how much he enjoyed Al Grass' article last month and expressing the hope that most of our members have the same views on natural history as those expressed by Al. Do you?

... *Editor*

* * * * *

BIRD TRIP TO BEAVER LAKE

by Tim Murphy

When the party of about 20 birders gathered at Beaver Lake on November 30 the sky was overcast and threatened rain. A pair of Ravens, which flew over as the party made its way down to the lake, seemed

an added portent of gloom.

At first glance the lake seemed empty, except for three Hooded Mergansers. But a closer look revealed three Otters diving together farther along the shore. After watching them for about 20 minutes the party moved closer for a better look but even our approach did not disturb the otters. They simply swam quietly into the cover of nearby reeds.

We followed the path through the woods on the highway side of the lake and, while there were fewer birds than normal, we did manage to see most of the common woodland species such as Rufus-sided Towhee, Chestnut-backed Chickadee, and Golden-crowned Kinglet. Several times Kingfishers were heard near the lake while some of the party discovered a Sharp-shinned Hawk, a Pileated Woodpecker and both Bewick's and Winter Wrens.

At the Elk Lake launching ramp about 25 Coots and a few Double-crested Cormorants could be seen on the water while a large flock of Crows worked the shore. Across the water we could see more coots but nothing else.

When we started back across the fields we flushed about 40 Juncos, 3 Purple Finches and a large calico cat! Later an immature Bald Eagle was added to the list but, for the most part, the walk back to the cars was just exercise.

During lunch a pair of Pied-billed Grebes were seen on the lake as well as a Marsh Hawk cruising the reeds on the far side.

After lunch a somewhat reduced group went to Colquitz Pond where most of the puddle ducks missed at Beaver Lake seemed to have congregated. There were about 25 Canada Geese, many Wigeon, Mallards and Shovelers and lesser numbers of Green-winged Teal and Pintail, and 5 Gadwall. And, once near the water, a Great Blue Heron was flushed.

As we proceeded along the water's edge we

passed a small flock of House Finches and flushed a Virginia Rail and a Snipe. Working our way back along the edges of some thickets we put up another Snipe and a covey of California Quail. Then a discussion developed regarding the identity of a bird seen at the top of a distant fir. It was eventually decided that the mystery bird was a Northern Shrike, a decision confirmed when a passing Red-tailed Hawk disturbed the bird.

A small remnant of the original party then moved to Swan Lake to see if the Sandhill Crane was still there. It wasn't but we added a Pheasant and a Bufflehead for a total of 44 species for the day.

* * * * *

ANOTHER COLOURFUL WORLD

Few of us will ever know the unique thrill of seeing undersea life with the first-hand, almost face to face, view of a free-swimming diver. But, for 50 members of the Society, the experience at the General Meeting on November 21, was the next best thing. They were treated, through the words of Alex Peden, Curator of Marine Biology at the Provincial Museum, and the camera of Brent Cooke, photographic technician with the Museum, to an hour-long underwater tour of our offshore waters extending from Ogden Point to Alaska.

Alex began by taking us into the upper tidal zone where little more than curiosity is required to explore marine life, and ended with a plunge into deep water, 100 feet down, where none but the strong and well-equipped will ever venture. The world we saw was, by any measure second to none - even the Great Barrier Reef of Australia - in the complexity, colour, and variety of its fauna.

It was a bizarre world of alien shapes and strange colours, an awesomely beautiful world, and a world where rather fragile interrelationships, established over the millenia without the interference of man, are now threatened by our activities. Not the least of these threats results from the very technology which made the evening's program possible, the diving gear itself which, in the hands of one

man is a subtle tool of knowledge; in the hands of another, a club of destruction.

We saw how the sea, like the land, is a vast factory of life where survival, for some, means looking like something else, while for others it means being so abundant that even the most persistent pressures of predation leave a nucleus to build new generations.

Mrs. K. Suttill expressed the feelings of everyone present when, in thanking Dr. Peden, she described the evening as an 'almost magical' introduction to Another Colourful World. Ed.

AN IDEA FOR YOUR 1975 VACATION

by Jack Williams

I have just received a copy of the 1974 Family Farm Vacations booklet listing several farms and ranches in B.C. which are catering to those wishing to spend a week or two on a farm, eating good farm cooking and generally enjoying the outdoors in any way which appeals to them.

This sounds like a pretty good idea to me, especially for those of us who do not possess a camper and also for those who like to have a real bed to go back to at night after a long day's hiking. Again many of us feel it's more of a vacation if someone else does the cooking and other chores.

This way you can spend your holidays out in the country with nothing else to worry about but birding or botanizing or any other pursuit which you fancy. Many of the farms and ranches are far from any sizeable towns and in areas which should be quite interesting for the study of natural history. Some of the farms even include birdwatching as one of the possible attractions.

The average weekly charge seems to run about \$80 per week each for adults for 1974, possibly 1975 prices will be slightly higher.

This could be a good idea for a small group to select a ranch in, say, the Chilcotin area, and spend a couple of weeks on a Natural History holiday.

KIDS COUNTRY

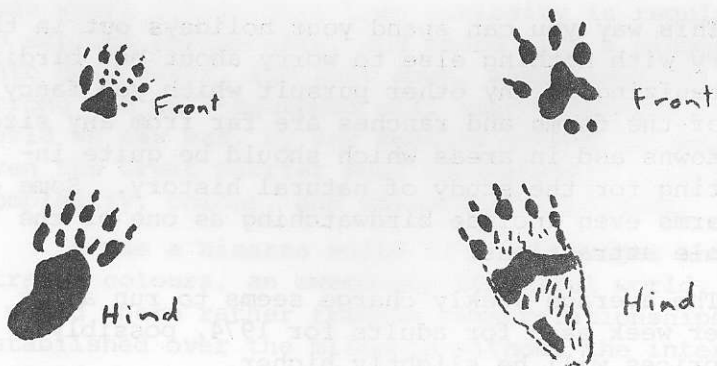
CASTING ANIMAL TRACKS by Craig Farnden

A good way to preserve animal tracks you have found for later reference is plaster casting. The apparatus required is as follows:

- cardboard strips that will easily bend and which are about 1 foot long.
- plaster of paris
- water
- mixing container
- stirring stick

First place the cardboard strip around the impression (track) to form a wall. Mix the plaster of paris so that it is about as thick as pancake batter. Using the stirring stick to prevent the plaster from dropping directly into the impression but rather around the edges, fill the impression.

When the plaster is dry, lift the casting out of the earth and wash it off. You now have an exact copy of the imprint.



Examples of animal tracks (not to scale)

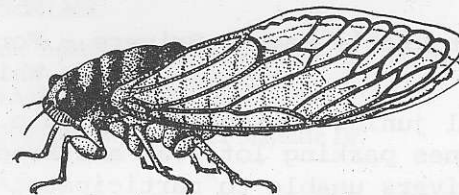
Raccoon

Grey Squirrel

ACROSS THIS LAND with Chris Walsh (part 3)

Passing through Cranbrook we stayed at Radium Hot Springs in Kootenay National Park where the pool waters were 82 and 115 degrees respectively. Returning from the pools we saw a Golden Mantled Ground Squirrel heading towards the pools. Was it on its way for a swim in the hot mineral waters too?

After dinner we walked the Sinclair Canyon Trail to the songs of Varied Thrushes and White-crowned Sparrows. During the walk I heard sounds of trilling that sounded like cicadas but with a different tone - like a cicada and a cricket together. The noise became deafening and came from the trees all around us. Then the rain came and we left.



On our way back to our hotel we discovered a pair of Barn Swallows roosting on the lights outside our room. The rain soon turned to hail and then back to rain again. Sitting on our patio in the darkness we witnessed a spectacular electrical storm that lit up the mountains encircling the hotel. The storm lasted an hour or more.

The next day we woke to the calling of Ravens and the twittering of Barn Swallows. Inside the elevator building leading up to the hotel there was a Barn Swallow's nest. It was in a good place because the building was heated and the door never closed.

(continued)

PROGRAMADULTS

Jan. 15 General Meeting. 8:00 p.m., St. John's
Ambulance Auditorium, 941 Pandora.

Speaker: Wayne Campbell

Topic: Birds and Territory

Jan. 18 Ornithology, Esquimalt Lagoon and Fort
Rodd. Meet Mayfair Lanes parking lot,
9:00 a.m. or Fort Rodd parking lot, 9:30
a.m. Lunch optional.

Leader: Jack Williams (656-1484)

JUNIORS

Jan. 4 Wittey's Lagoon. Drivers - Graham
- Askey

Jan. 18 Francis Park Drivers - Marrion
- Mothersill

Feb. 1 Margaret's Bay Drivers - Forbes
- Whitney

All junior outings meet 1:30 p.m., Mayfair
Lanes parking lot, Oak and Broderick. If
drivers unable to participate, contact
Gail Mitchell (477-9248) as soon as
possible.

INTERMEDIATES

Jan. 11 The movie 'Beaver Pond' will be shown by
Garry Green at 7:00 p.m. For more de-
tails call Jennefer Fisher (592-0024)

AUDUBON FILM

Jan. 31 8:00 p.m. Newcombe Auditorium

Feb. 1 2:30 and 8:00 p.m. " "

WILD ANIMALS

WITH - SAN SCHIPPERS AND HENK KEGEL

"A brilliant study of the wild creatures of Africa"

COORDINATORS

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