Burgess Shale Continues to Confound

Life is simpler today than it was long ago. Today, there are only a few basic patterns for bodies to follow — the mammal pattern, the bird pattern, the arthropod pattern, and so forth. Long ago, things used to be much more complicated.

In fact, this is the central truth underlying one of the most revolutionary discoveries in the history of palaeontology — and it all started here in Yoho National Park!

Just up the hill from where our new Travel Information Centre now stands, Dr. Charles Walcott, a scientist with the Smithsonian Institute in the United States, discovered the first of the Burgess Shale fossils in 1909. Dr. Walcott knew the find was special, but he couldn't imagine just how special. In Walcott's day, evolutionary theory presumed that today's living diversity had arisen from simple beginnings through a long, slow process of natural selection. Scientists assumed that a few simple animals had gradually become more and more complex, and branched into more and more kinds of animals.

Walcott, like others of his day, felt that the purpose of all this long, slow progression was to produce mankind — the end product and highest achievement of evolution. He was excited with the discovery of a rich bed of fossils in 530-million-year-old rock, high on a shoulder of Mount Wapta. Walcott reasoned that these exquisitely preserved fossils were the simple, early ancestors of today's more complex creatures.

In the last twenty years, however, scientists have taken a second, more objective and detailed look at the Burgess Shale, and their discoveries have turned Walcott's confident sense of man's ascendancy upside-down. In fact, the animals of the Burgess Shale were more diverse and no less highly-specialised than today's living creatures. Life today is less, not more, complicated than it was half a billion years ago.

In a number of magazine articles and a best-selling book, science writer Stephen Jay Gould has taken these discoveries and explored their significance. In a radical departure from earlier theories, Gould says that Yoho National Park's unique fossil record shows that today's animals, including man, are the product of accident, rather than the inevitable results of the stately march of organic evolution.

Is Gould right and Walcott wrong? Are there new, even more startling revelations lying hidden in the thin shale of the Stephen Formation? Scientists, led by Dr. Desmond Collins of the Royal Ontario Museum, continue to search for the answers.

In a world where historians can't even agree on what happened yesterday, it is unlikely that we will ever have a complete picture of the life and environments of the earth's adolescence. The geological record is a book of stone, with many pages smudged or missing. However, few of the pages of time are as elegantly written, and as full of unique and startling revelations, as these thin leaves of shale protected high in the Rocky Mountains of Yoho National Park.

See Sharing the Story, Page 2
Sharing the Story

The Burgess Shale is rigorously protected by the Canadian Parks Service. These fragile fossil deposits are of global scientific importance. Many Burgess Shale animals are known from one single fossil specimen — if that specimen had been damaged or stolen by an unsuspecting amateur, the information it contained would have been lost forever.

The park allows a very limited number of guided walks to the fossil beds each summer, but they are restricted to fifteen people or less, on a first-come, first-served basis.

Many people haven’t the time or energy for these steep hikes, while others find that the hikes are not offered on the days when they’re in Yoho. To make the Burgess Shale story more accessible to our visitors, we have developed a variety of media closer to the road. This allows us to protect the fossil site while giving a much more complete picture of the Burgess Shale to many more people.

Yoho Island — Earth National Park

When astronauts took the first pictures of Earth from outer space they forever changed the way in which we see the world and our place on it.

From space, the boundaries of Yoho National Park are invisible. This protected area, set aside in 1886 to be “preserved unimpaired” for all time, is just another part of the great Rocky Mountain ecosystem, with its glacier-fed rivers, forested valleys, serrated peaks, and interconnected life system. Would they have been able to fool themselves with the idea that a national park can be protected merely by drawing a line around it and passing a few laws? Maybe they would — after all, in 1990 many of us still have the same optimistic assumption.

Of course, it’s true that Yoho National Park is one of the few surviving places in North America whose environment looks almost the same today as it did a century ago. Wolves still howl on the Ottertail Flats, ancient forests stretch unbroken along the valley slopes, and mountain goats live alone amid the rocks and wind of the high country. But that wind no longer smells the same as it used to. Sweeping in from the southwest, Yoho’s weather brings ozone pollution from distant cities and smoke haze from logging slash fires throughout the province of British Columbia. Air pollution has changed forests and damage watersheds in other parts of Canada — how impaired are Yoho’s?

Clear-cut logging has radically changed the valleys that border the park, and the changes affect animals that live in, and are supposed to be protected by, Yoho. Elk, moose, wolf, and black and grizzly bears are hunted along the boundaries. Yoho’s once remote wilderness is now accessible by logging roads that penetrate to the edge of our boundaries.

Like all of Canada’s national parks, Yoho is becoming an island besieged. Fortunately, Yoho is linked with three other great parks (Kootenay, Banff, and Jasper) into a protected area so large that it is buffered against many of the effects of change. Other national parks like Glacier, Mount Revelstoke, and Waterton Lakes are less lucky. Their wildlife populations and scenery have been irreversibly changed by things over which park managers have no control.

When you touch one thing, you find it linked to everything else in the universe,” wrote John Muir, founder of the wilderness preservation movement. As national parks become increasingly threatened by events outside their boundaries, the truth of Muir’s statement becomes increasingly clear.

If Yoho, and Canada’s other national parks, are to survive “unimpaired” for all time, it will only be because Canadians have taken to heart the truth that the Earth is one great, intricate, and fragile ecosystem. It is all important, all connected... and all we have.

National parks are places that represent the richness of the world we share. Ultimately, each one of us will determine whether these parks, and this Earth, survive. As consumers, as voters, and in the many individual choices we make in our day to day lives, we will determine the future of this planet, and of the great national parks that celebrate its diversity.

A Yoho Winter Challenge

Imagine fattening up all summer and fall, and then sleeping the winter away. Oh, how you might want to eat, eat, eat, right up through winter, but most of the time your body survives on its fat reserves.

That’s the solution marmots, chipmunks, ground squirrels, bats, and bears have found to cope with long, cold winters. While curled up in the safety of their dens, these animals make the best use of their fat reserves through a lower temperature, a reduced heartbeat, and slower breathing.

Some animals avoid winter totally by migrating to warmer climates, while other small critters find life under an insulating blanket of snow to be an acceptable way to pass the colder months. Pikas, mice, shrews, and red squirrels spend the summer and fall gathering and storing a supply of food in preparation for winter. Mice and red squirrels occasionally supplement this cache by continuing to seek out new food sources under the snow. The beaver has also spent a busy fall replenishing its underwater food cache of aspen wood so it can live securely in its world under ice.

But not all animals are able to store a winter’s supply of food. Moose, deer, and elk would have a difficult time trying to hide under the cover of snow. Instead, these mammals seek the shelter of valley bottoms where food is more plentiful and accessible. Moose, with long legs that travel easily through deep snow, browse on willow shrubs in meadows. Along the highway, you might encounter elk or deer pawing for grass under the snow. At sunset, sunrise, or at night, these animals are hard to see, so be alert in order to avoid hitting one.

In the high alpine areas, extreme cold and harsh winds test the effectiveness of the mountain goat’s shaggy white fur. The goat is the only large mammal adapted to withstand the harsh winter weather up high, where wind and cold can shrivel the growth of vegetation to ground level and krumholz (stunted trees). The mountain goats blend in well with their white environment as they forage for alpine plants on windswept ridges.

Many animals that stay active in winter grow a thick coat of fur or hair. A change in color gives snowshoe hares, weasels, and ptarmigans further protection. Their white fur or plume camouflage them in the snow to deceive predators. Porcupines don’t change colour, but tend to spend weeks at a time eating from one tree where they are well out of reach of most of their enemies.

Winter birds, like chickadees, gray jays, woodpeckers, and ravens, fluff up their downy feathers to trap insulating air. But most birds won’t even stick around for the cold weather. Instead they head for the sunny south — not unlike many people!

There’s yet another method of dealing with winter. Most insects die off in the cold, but eggs and pupae wrapped in cocoons are protected by glycerol in their tissues — a kind of natural antifreeze. Trees, shrubs, grasses, and herbs also take a rest during the frigid months. Snow acts as an insulator, protecting their roots from freezing.

Despite these various methods of coping with winter, many animals meet their end during this trying season. You and I may not be adapted to sleep the winter away, but we can at least escape the cold by entering our warm buildings. So, as we sit in our cozy rooms, remember all the living creatures which must endure the long, cold winter nights out of doors.
Study leads to better bear management

New research is being conducted on grizzly bears in Yoho and Kootenay national parks to help bear managers make better decisions on conservation and public safety, according to Yoho park warden Kevin McLaughlin. "Knowledge leads to more effective bear management," McLaughlin says. "If we know the bear's habits and home range during the course of the year, we can reduce the potential for human/bear conflicts and protect the bear population and its habitat."

Wardens in Yoho and Kootenay are assisting consultant Michael Raine in gathering extensive data on grizzly bears, including bear numbers, food habits, habitat use, and movement. The study will focus on three main areas: identifying places where human/bear conflicts might exist, determining the specific requirements of grizzlies at different stages of their development, and evaluating watershed areas in the parks to identify those which best support the bear population.

The information gathered from the study will allow park officials to better recognize areas where the likelihood of bear encounters exist and then plan hiking trails around those areas. Protecting the bears and their environment will help ensure their long-term survival.

"That's the real benefit of a study like this," McLaughlin says. "When human/bear conflicts occur, the bear might win initially, but he loses in the end unless we can protect his environment."

The project is the first detailed bear study conducted in Yoho, and employs the latest technological equipment for monitoring bear movement, recording data, and ensuring statistical reliability. Culvert traps are used to capture the bears, which are then tranquillized and fitted with motion-sensitive radio collars that allow their movements to be followed. Wardens then record information about the grizzly's physical characteristics and the area in which it was found.

Park wardens must be absolutely certain they are able to safely handle the bear once it's trapped. This means everything from making sure the bear fully recovers from the tranquillizer to keeping a close eye on a cub that might linger near its trapped mother.

"Everything has to be right before I set a trap or snare," Kevin McLaughlins says. "Safety is number one — for both the bears and wardens!"

In 1988, seven different grizzlies were collared in Yoho and Kootenay; the goal between the two parks is twelve. The information from further investigations over the next two years will help bear managers ensure the protection of park visitors and the survival of the grizzly bear.

Watch for these signs

A system of signs and symbols communicates information to park visitors. For example, the services symbol informs the visitor that basic services such as gasoline are available here. Look for these symbols as you travel through the park.

LIST OF CONTRIBUTORS:

Joe Benge, Dave Cairns, Joanne Cairns, Ian Church, Jacqui Hunter, Grant Kaiser, Rob Scooble, Mike Skakum, and Kevin Van Tighem. Produced by Community Affairs, Western Regional Office, Calgary.
In the vicinity of Wapta Falls, Sir James Hector was kicked by a packhorse in 1858 — The Kicking Horse River got its name as a result! The falls are accessed by a short drive up a dirt road, and then a 2 km walk.

A fork in a steep trail (6.1 km return) takes you to upper and lower viewpoints just before reaching these capped pillars of glacial debris. The trail starts in the Hoodoo Creek campground.

The Kicking Horse River has carved a natural bridge through solid rock in this location, 1.6 km from the Trans-Canada highway.

Discovered by Tom Wilson in 1882, Emerald Lake has become a popular destination for many visitors. Canoeing, fishing, hiking, and horseback riding are available here.

From this viewpoint you can watch the trains enter the upper tunnel. Nearby, visit an old locomotive by hiking the Walk-In-The-Past trail.

The icy blue Kicking Horse River and the silt-laden Yoho River meet here. See if you can tell them apart.

With a free fall of 254 meters, this waterfall is one of the highest in North America. A 12 km drive on the Yoho Valley Road will bring you to the Takakkaw Falls.

An interpretive display explains the history and present operation of the Spiral Tunnels. You can see the Yoho Valley from the viewing platform.

An old railway bridge that was part of the original Canadian Pacific Railway route through the Kicking Horse Pass is located here. The Big Hill had the most severe grade of any railway hill in North America — dropping 400 meters from the Great Divide to the valley bottom.

Here you can see a small stream which splits into two branches — one flowing east to Hudson Bay and the other flowing west to the Pacific Ocean.
Wildlife Memorial 1990
August 1 – August 8

This August, bright orange flags along the highway in Yoho National Park will mark the sites where animals have been killed by vehicles over the past ten years.

There will be about one thousand flags placed on the roadside for Wildlife Memorial Week, each one commemorating the death of an elk, moose, mountain goat, wolf, coyote, or deer.

The Wildlife Memorial project is meant to make drivers aware of the terrible toll traffic takes on our wildlife. In the ten year period between 1979 and 1989 over 3,000 elk, moose, bears, and other large animals were killed by vehicles in Banff, Jasper, Yoho, Kootenay, Mount Revelstoke, and Glacier national parks.

But it's not only the animals that suffer — drivers and passengers can be seriously injured too. Imagine a 400 kilogram moose crashing through your windshield.

So as you drive this summer — and all year long — please slow down and keep your eyes peeled for wildlife.

Let's all enjoy them, not destroy them.

Rules of the Mountain Road

For many new visitors to Yoho National Park, the experience of travelling mountain roads can be overwhelming. Driving in the mountains conjures up ideas of narrow, winding roads suspended high above steep gorges, and you will experience this on the Yoho Valley Road. But most of your travel through the park will be on the Trans-Canada highway.

The Trans-Canada was constructed between 1955 and 1958, and is the major transportation corridor through the Rocky Mountains. The highway is a single lane each way through Banff and Yoho national parks, except for a short twinned section from Banff’s east gate to the Sunshine Village exit. It is used by both commercial and recreational vehicles, and traffic volumes are always increasing. Unfortunately, accident rates are also increasing.

Motor vehicle accidents are unwanted at any time, but can cause additional problems for out-of-province travellers. Unfamiliar roads and too much sightseeing while driving have caused many accidents. Drivers should exercise caution, use common sense, and apply good defensive driving skills to ensure their visit to Yoho will be a safe and happy one.

The speed limit is 90 km/h, except for viewpoint areas where the limit is 60 km/h. When road conditions are good, drivers should strive to maintain a safe, consistent speed, always watching for reduced speed limit areas. The highway is patrolled by the Royal Canadian Mounted Police and park wardens.

Rest stops, picnic areas, and viewpoints are located along the Trans-Canada. It is much safer to stop your vehicle in these designated areas rather than along the road. If you must stop, make sure that your vehicle is safely off the travelled portion of the road, out of the way of other traffic.

Poor visibility and black ice are not uncommon, even in the spring and fall. Driving conditions deteriorate during winter months, and summer rain storms can turn into snow at mountain elevations. Snow tires or chains are required by law on the Trans-Canada when travelling through any mountain park between November 1 and April 30.

The following points may be useful to you:

- The use of seat belts is mandatory in Canada.
- It is illegal to drive on the paved shoulder. Cyclists ride their bikes on the shoulders and vehicles might be parked there.
- Be patient with slow moving vehicles on hills. Steep mountain passes cannot be climbed or descended quickly by motorhomes and transport trucks.
- Check your mirrors and blind spots before pulling off the road. Put your hazard lights on, and be careful getting out of your vehicle. Never stop your vehicle in the driving lane.
- Do not pass on double solid lines or on the right.
- Watch for wildlife straying onto the road, especially where the white elk signs are posted. These signs are posted near common elk migratory routes.
- Read and obey the traffic signs and painted lane markings, especially the speed limit signs.
- Drive with your headlights on in the mountains.
- Drive defensively by looking for people who disobey these rules.
- Report the licence plate numbers of unsafe drivers to the local R.C.M.P. detachment at 343-6316 or the park warden office at 343-6324.
- Have a safe and enjoyable holiday.
The Friends of Yoho

In Yoho National Park, a group of citizens have founded the Friends of Yoho Society. Last November, the Friends signed an agreement with the Canadian Parks Service to co-operate in the "protection, preservation, and interpretation of natural and historic resources in Yoho National Park."

Earlier this year, the friends were in a frenzy of activity — recruiting members, planning various activities for Environment Week '89, and preparing for the opening of a sales outlet in the new information centre. From guidebooks and topographical maps to biodegradable garbage bags and soap, the retail outlet provides the information and products that help improve your understanding and enjoyment of the park, while supporting the mandate of conservation and preservation.

Watch for items produced by the Friends of Yoho, sporting this logo. The design signifies the importance of Yoho National Park as a historical, geological, and geographical treasure. Revenue from retail sales and membership fees will be applied to new products and projects.

If you would like to know more about the Friends of Yoho, pick up a brochure at the park information centre. To join the Friends mail your name, address, and postal code to: The Friends of Yoho, P.O. Box 100, Field, B.C., VOA 1G0. Please include a list of your specific areas of interest, and a cheque or money order for your membership dues ($10 for associate, $15 for voting, and $25 for families). Members receive a number of benefits, such as a discount at the sales outlet.

Bucking horse part of Yoho history

Starvation and a bucking horse nearly killed Yoho’s first explorer, James Hector.

Hector discovered the Kicking Horse Pass route through the Rocky Mountains in 1858 while working as a geologist on the Palliser Expedition — a group sent by the British government to assess the settlement prospects of the Canadian west.

Assisted by Nimrod, a Stoney Indian guide, and three others, Hector coaxed reluctant horses through hundreds of kilometres of wet brush and deadfall, across fast flowing rivers and along precipitous ledges through what is now Banff, Kootenay, and Yoho national parks.

Wet weather spoiled their provisions and dense forest on the west side of the Great Divide made stalking game difficult. Despite seeing deer and elk tracks, mountain goats on distant ledges, and geese high overhead, the party managed to catch only two grouse and one trout in six days.

The expedition’s problems multiplied when a horse kicked Hector in the chest, knocking him unconscious for two hours. In pain, Hector remounted his horse the next day, aware that his party desperately needed to find some game. That day his men named the unknown river they followed the Kicking Horse.

Just after they crossed the Kicking Horse Pass, Nimrod finally shot a moose ending the worst part of their ordeal. The shooting attracted a nearby hunting party of Stoney Indians, old friends of Nimrod, who took the weary adventurers back to camp and helped them recover.

In 1884, Canada’s first trans-continental railway used the Kicking Horse Pass route to the Pacific Ocean. With the completion of the railway, the mountains became a place of great beauty instead of great obstacles. Realizing the need to preserve exceptional areas, the Canadian government established Yoho National Park in 1886.

Forty-five years after his great adventure, the Rockies lured Hector back again. This time he rode a luxury rail coach among the peaks and canyons and dined in style where before a mere handful of blueberries had been a welcome meal.

It’s up to You!

The objective of the Canadian Parks Service is to protect, for all time, those places which are significant examples of our natural and cultural heritage, and to encourage public understanding, appreciation, and enjoyment of this heritage in ways that leave it unimpaired for future generations.

Your help in meeting this objective is essential to our success. Exercise good judgement and common sense when visiting our national parks, and try to apply sound environmental practices in all aspects of your daily life. Together, we can make a difference!
PARK INFORMATION

Opening and Closing Dates

Information Centre
To June 15 ... 8:00 a.m. - 4:00 p.m. Monday - Thursday
... 8:00 a.m. - 5:30 p.m. Friday - Saturday
June 16 - Sept. 4 ... 8:00 a.m. - 9:00 p.m. daily
Sept. 5 - Oct. 1 ... 8:00 a.m. - 7:00 p.m. daily
Oct. 2 - mid-June, 1991 ... 8:00 a.m. - 4:00 p.m. daily

Chancellor Peak Campground* May 18 - Oct. 9
(Self-registration)
Kicking Horse Campground* May 18 - June 15
(Self-registration)
Lake O’Hara Campground* June 16 - Sept. 30 (Staffed)
Takakkaw Falls Campground* June 22 - Oct. 2
(Self-registration)
Hoodoo Creek Campground* June 29 - Sept. 4
(Self-registration)

*Checkout time: 11:00 a.m.

Important Telephone Numbers
R.C.M.P. 343-6316
AMBULANCE (Dispatch) No charge 1-374-5937
HOSPITAL (Golden) 344-2411
HOSPITAL (Banff) (403) 762-2222
PARK ADMINISTRATION Lake O’Hara Lodge 343-6433
LAKE O’HARA RESERVATIONS 343-6433
ACC RESERVATIONS (403) 762-4481

Lake O’Hara
Access: On foot: Hike the 13 km Cataract Brook Trail.
By bus: Reservations are required for in-going trips and
may be made up to one month in advance. Please
notify the park of cancellations. Bus fee is $5
admits and $2 children, one-way. No dogs.
Reservations: Day-users, campers 343-6433
ACC hut users (after reservation is made) 343-6433
Lake O’Hara Lodge (mid-June to late September) 343-6418
(October to June) (403) 762-2118
Bus Schedule: Incoming: 8:30 a.m., 11:30 a.m., & 4:30 p.m.
daily plus 8:30 p.m. Fridays
(June 22 - Aug. 31) or
7:30 p.m. Fridays (Sept. 7 - Sept. 28)
Outgoing: 7:45 a.m., 9:30 a.m., & 4 p.m.

Getting to Know Yoho National Park

Free Interpretive Events

During the summer we invite you to join park naturalists
in exploring Yoho’s unique mountain landscape. Lying along
the western side of the great divide, Yoho offers a very
different kind of experience from that found in Banff or Jasper
national parks. Winds from the Pacific carry moisture to the
park all year long, and there’s a relatively long growing
season. Parts of Yoho are reminiscent of the cedar forests of
the West Coast.

Our summer interpretation program will give you a great
overview of the park. Naturalists present lively theatre and
campfire programs in five campgrounds, where you’ll learn
about our natural and human history, the fascinating Burgess
Shale fossils, and what’s in store for our national park system
in the future.

Come on a guided hike with us and discover unique land-
scapes, spectacular mountain scenery, flowers and animals,
valleys, steep walled canyons, and rushing waterfalls.

All events are free. Many of our programs are available in
both of Canada’s official languages (English and French).

During summer, a detailed schedule of events is available
from the Travel Information Centre and at campground
kiosks. Remember, Yoho is in the Mountain Time Zone, as is
Alberta.

For more information, please call (604) 343-6324.

Winter Events

Snow usually covers Yoho’s trails by early November,
and many stay impassable until well into June. Winter outdoor
activities include cross-country skiing, ice-climbing, and
snow-shoeing.

There is no regular schedule of guided walks or
interpretive programs, but we welcome requests for special

Self-guiding Trails

In summer, the Walk-in-the-Past self-guiding trail offers
a glimpse into the railway history of the infamous “Big Hill.”

The trail begins at the trailer circle in the Kicking Horse
Campground near the theatre. A brochure to guide you along
this 2 kilometre (1 hour) trail is available at the trail head.

During both summer and winter, the self-guiding trail
around Emerald Lake is one of the easiest and most enjoyable
in the park. Signs along the way explain forest ecosystem
changes from one side of the lake to the other. In winter, this
trail makes a delightful 5 kilometre (1-2 hour) ski tour.

Burgess Shale Exhibits

Visitors to Yoho National Park no longer have to go on a
difficult guided hike to learn about the world famous Burgess
Shale fossils. There are now two new exhibits at road-
accessible locations, and a recently printed brochure available
at the park Visitor Centre.

See Page 2 for a description of these exhibits.

INTERPRETIVE EVENTS, June 29 - Sept. 3, 1990

Burgess Shale Fossils: Talks in Visitor Centre,
Mon, Thurs, Fri. 10 a.m.

Evening Theatre Programs: Kicking Horse Campground,
Mon, Tues, Fri, Sat. 10 p.m. – July
(French), Sat. 8 p.m. – July (8:30 p.m. Aug.)

Evening Theatre Programs: Hoodoos Campground,
Sat. 10 p.m. – July (9 p.m. Aug.)

Evening Campfire Programs: Chancellor Peak Campground,
Fri. 8 p.m.
Evening Campfire Programs: Lake O’Hara Campground,
Fri. 9:30 p.m.
Evening Campfire Programs: Takakkaw Falls Campground,
Sun. 8:30 p.m.

Campground talks are offered every Thursday at 8:00 p.m. in
the municipal campground at Golden, B.C. Other agencies offer
programs there every night of the week.

Hike to Walcott Fossil Beds: Saturday 9 a.m.
(reservations 3 weeks in advance or less)

Guided activities also available in other areas,
Mon, Thurs, Sat, Sun.

For fossil hike reservations and other details contact Visitor
Services at (604) 343-6324.

ADDITIONAL INFORMATION

For additional information about Yoho National Park, please
call (604) 343-6324, or write:
Visitor Services, Yoho National Park
P.O. Box 99
Field, B.C., V0A 1G0

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