

AVALANCHE NEWS NO. 4

October 1980

EDITORIAL NOTE

Avalanche News is a vehicle of communication between people engaged in avalanche work in Canada and is issued three times per year. The next issue, Number 5, is planned for publication in late January 1981.

Contributions to Avalanche News are made by people concerned with avalanche safety programs. Members of the Canadian Avalanche Committee act as editors and the British Columbia Ministry of Transportation and Highways distributes the News.

There is no subscription fee. Anybody wishing to obtain Avalanche News should request it from the Committee.

**AVALANCHE**  
Canadian Avalanche Committee, 3904 West 4th Ave., Vancouver, B.C., V6R 1P5

**NEWS**

No.4 OCTOBER 1980



## AVALANCHE ACCIDENTS

On 8 August an avalanche killed a mountain climber and injured another one at the northeast buttress of Slesse Mountain near Chilliwack, B.C. The climbers were walking on a moraine at the base of cliffs when a large avalanche coming from above caught them and carried them over a distance of 400 m to 500 m. When the avalanche stopped both persons were on the surface at the edge of the deposit. One climber had died from multiple head injuries (he had his climbing helmet in his pack) and the other suffered multiple fractures to one arm, abrasions and cuts.

The avalanche originating from a small glacier occurred at 1500 hours on a very warm day with temperatures 28° to 30° C in the Chilliwack Valley. Numerous other avalanches ran on the same day at Mount Slesse. The avalanche snow was wet and contained chunks of ice. The deposit had a maximum depth of about 10 m.

The accident was investigated and reported by Corporal Terry Barter of the R.C.M.P. at Chilliwack.

Herb Bleuer reported that during the past winter avalanches had buried mining equipment on the Sittakany Glacier in the Northern Coast Mountains. The equipment, including compressors, a generator, drills and loaders with an estimated value of \$250,000 was left in the open in front of an exploration adit during the winter. It was buried and shifted by avalanches and found in a crevasse when the exploration work was resumed in the summer.

## AVALANCHE INVOLVEMENT REPORTS

With the objective of collecting data about the extent of avalanche problems in Canada the Avalanche Committee requests that all accidents and encounters of persons, vehicles and structures by avalanches be reported. The individual reports will be treated confidentially and only a summary will be made public. It is expected that the summary of the reports will draw attention to avalanche dangers and assist in developing safety measures.

Two different forms are available for recording and reporting accidents. The short reporting form, which contains only space for reporting the actual encounter by persons or objects with avalanches, must be completed for every event. The detailed reporting form is more comprehensive and allows recording of the characteristics of the avalanche, the circumstances leading to its formation and details of the accident. The completion of the detailed form is voluntary, but is recommended when the avalanche either resulted in a fatality, serious injury, or property damage in excess of \$10,000; or when the incident is highly educational or of unusual circumstances.

At the beginning of the winter 1979-1980 cards for short reports were distributed. Many users found the cards inconvenient and stated preference for a form of size 210 mm x 274 mm which could be folded for mailing. Because large supplies of the previous form exist, the use of these cards will be continued until the supply is exhausted. The cards may either be mailed open by adding a stamp or be folded and mailed in an envelope.

Copies of the new detailed reporting form will be available by the end of November 1980.

All forms are available from Geoff Freer, Senior Avalanche Co-ordinator, Ministry of Transportation and Highways, 940 Blanshard Street, Victoria, British Columbia, V8W 3E6, telephone 604-387-1738.

#### GUIDELINES FOR OBSERVATIONS

The guidelines for observation of the weather, snowcover, and avalanche occurrences for the purpose of evaluating snow stabilities and avalanche hazards have been revised. The revised guidelines will be printed in the course books of the BCIT/NRC avalanche courses of the winter 1980-1981. Copies will be made available to avalanche safety operations in Western Canada at the beginning of the winter.

The Associate Committee on Geotechnical Research of the National Research Council has offered to print the guidelines as a Technical Memorandum. It is expected that this publication be ready for the avalanche season of 1981-1982.

The guidelines contain the following chapters:

Weather observations

Snow profile observation

Short snow profile (also called hasty pit)

Ram profile

Box shear test

Shovel shear test

Observation sites

Observation of avalanches

AVALANCHE RESEARCH OF THE NATIONAL  
RESEARCH COUNCIL OF CANADA

The avalanche study group of the National Research Council consists of Peter Schaerer and Dave McClung, both having their base at Vancouver, British Columbia and Paul Anhorn who is in charge of the field operation at Rogers Pass, British Columbia. In addition to the three permanent staff members two technicians are hired for the duration of the winter for assisting with the field observations at Rogers Pass.

The avalanche study group is part of the Geotechnical Section of the Division of Building Research of the National Research Council. The Geotechnical Section provides a research service to the construction industry of Canada in the use and behaviour of mineral soils, rock, permafrost, snow and ice.

About 70% of the total working time of the avalanche research staff is spent on research, with the rest of the time dedicated to avalanche courses and consulting work.

The emphasis in the research work is placed on developing information that is applicable when engineering problems must be solved. The following projects are currently carried out.

Characteristics of avalanches in motion

The project requiring the greatest effort and most funds is concerned with making observations of impact pressures, seismic signals, velocities, flow depths, and runout distances of well developed full-size avalanches. The avalanche paths Tupper 1 and Tupper 2 at the east side of Rogers Pass have been equipped with a series of load cells and geophones which record signals from moving avalanches during the winter. Although the observations were initiated ten years ago, in the winter 1979-1980 complete observations of signals for a wet snow avalanche was obtained for the first time. Comparison with the other data from dry snow avalanches showed that wet snow has more uniform flow characteristics without the wave-like turbulence bursts apparent in dry snow flow.

A circular plate with a diameter of 500 mm was set up near the load cells of smaller size. The load cells behind the plate were destroyed by avalanches early in the winter 1979-1980 by tensile loading. Observations showed, however, that following impact by dry snow avalanches the plate had a dense symmetrical cone of very hard snow on it. These observations indicate intense shearing during the impact and underscore the importance of compressibility effects in treating impact problems on surfaces of large area.

The observations of impact pressures and seismic signals is a continuing project. In the winter of 1980-1981 the large plate will be set up again with load cells designed to handle tension, compression and shear loads. Analysis of data will be combined with theoretical analysis for incorporation into avalanche dynamics modelling and impact problems. Seismic equipment for measuring avalanche speeds will be set up in the avalanche paths Tupper 1 and Tupper 2 for observation of avalanches of different size.

#### Amount of snow moved by avalanches

Since 1966 observations were made of the amount of snow brought down by each individual avalanche at 40 avalanche paths at Rogers Pass. The observations will be continued for as many years as possible. The existing data will be analyzed with the intention of making predictions on the size of maximum avalanches and for correlation of the effects of avalanche mass on runout distance.

#### Variation of snow with elevation

At 16 mountains in southern British Columbia and Alberta annual observations are made of the maximum water equivalent of the snow on the ground at different elevations. The objective is to determine the function between the snow load and the elevation above sea level, information that is vital in the design of buildings.

#### Avalanche hazard evaluation

In the winter of 1979-1980 Chris Stethem at Whistler and John Tweedy at Rossland under contracts with the National Research Council tested the applicability, techniques, and critical values of the shovel shear test and the box shear test in the day-to-day snow stability analysis. The results will be summarized by Chris Stethem at the Avalanche Workshop on 3-5 November 1980. The studies will be continued in the coming winter 1980-1981.

#### Snow creep pressures

Dave McClung developed a theoretical model for creep pressure calculations for avalanche defense structures. The future plan is to compare the theoretical model with field measurements.

Slow shear failure

In the winter 1979-1980 slow shear failure data were collected from the maritime climate at Whistler, for comparison with data from Banff. The Whistler data with more fine grained equitemperature snow indicate initially higher peak strength and shorter strain to failure than coarse grained temperature gradient snow from the Rockies.

The measurements of shear failure data will be continued in the coming winter in a cold room at Whistler Mountain and micro-structural analysis of shear failures in snow will be initiated.

OPERATIONAL AVALANCHE COURSES

Avalanche training courses again are organized by the British Columbia Institute of Technology and the National Research Council. The following courses will be held in the winter of 1980-1981 providing a minimum number of registrations are received.

Level 1 (introductory)

Avalanche safety for ski areas

November 29 - December 5 at Whistler

January 12-18 at Jasper

Avalanche safety for ski guiding

December 6-12 at Whistler

January 12-18 at Creston

Avalanche safety for transportation and industry

November 24-28 at Creston

December 1-5 at Creston

Level 2 (advanced)

Avalanche safety for ski areas

January 24-31 at Whistler

Avalanche safety for ski guiding

December 14-21 at Golden

January 3-10; location undecided; tentative date for a course if there should be sufficient demand.

Avalanche safety for transportation and industry

December 8-12 at Creston

Prerequisites for the Level 2 ski area and guiding courses are:

- a) Completion of a Level 1 or equivalent course.
- b) Field application of the knowledge of the Level 1 course for a total of 100 days.
- c) Pass mark at an entry exam of the knowledge of the Level 1 course.
- d) At the beginning of the course, presentation of a set of weather, snow pack, and avalanche observations made by the student during an avalanche period.

All ski area and ski guide courses will qualify successful candidates for the appropriate levels of mountain guide and ski guide courses of the Association of Canadian Mountain Guides. The courses on avalanche safety for transportation and industry are not valid for mountain and ski guiding.

Further information and brochures containing application forms may be obtained from:

British Columbia Institute of Technology  
Division of Continuing Education  
and Industry Services  
3700 Willingdon Avenue  
Burnaby, British Columbia  
V5G 3H2

Attention: Avalanche 1980-1981

Telephone: 434-5734, local 637



PUBLICATIONS

C. J. Stethem and P. A. Schaerer

Avalanche Accidents in Canada II. A selection of case histories of accidents 1943 to 1978.

National Research Council of Canada, Publication No. NRCC 18525; July 1980, 75 pp.

A first publication (NRCC 17292) described avalanche accidents between 1955 and 1976. The present book contains a total of 27 cases, those of the years 1976 to 1978 and selected ones from earlier years.

The publication may be obtained by mailing the amount of \$3.50 (money order or cheque, made payable to the Receiver General of Canada, credit NRC) to Publication Sales, National Research Council of Canada, Ottawa, K1A 0R6

S. C. Colbeck ed.

Dynamics of Snow and Ice Masses. Academic Press, Inc. Toronto, April 1980; 512 pp. U. S. \$55.00

The book describes in seven chapters the growth, motion and decay of snow and ice masses: ice sheets, glaciers, sea ice, icebergs, fresh-water ice. It includes a chapter by D. H. Male on the properties of the seasonal snow cover and a chapter by R. I. Perla on avalanche release, motion and impact.



AVALANCHE RESOURCE AGENCIES  
OCTOBER, 1980

National Research Council Canada

3904 West 4th Avenue  
VANCOUVER, B.C. V6R 1P5

Phone: 604-732-4756

Attn: Peter Schaerer

Rogers Pass Field Station  
ROGERS PASS, B.C. VOA 1N0

Phone: 604-837-6274

Attn: Paul Anhorn

Parks Canada

Glacier/Mt. Revelstoke  
P.O. Box 350  
REVELSTOKE, B.C. VOE 2S0

Phone: 604-837-5155

Attn: Chief Park Warden

Yoho National Park  
Box 99  
FIELD, B.C. VOA 1G0

Phone: 604-343-6467

Attn: Chief Park Warden

Kootenay National Park  
Box 220  
RADIUM HOT SPRINGS, B.C. VOA 1M0

Phone: 604-347-9615

Attn: Chief Park Warden

Kluane National Park  
Haines Junction  
YUKON

Phone: 403-634-2251

Attn: Chief Park Warden

Waterton Lakes National Park  
WATERTON, ALBERTA TOK 2M0

Phone: 403-859-2352

Attn: Chief Park Warden

The Superintendent  
Banff National Park  
P.O. Box 900  
BANFF, ALBERTA TOL OCO

Phone: 403-762-3324

Attn: Peter Fuhrman, Alpine Specialist

The Superintendent  
Jasper National Park  
P.O. Box 10  
JASPER, ALBERTA TOE LEO

Phone: 403-852-4401

Attn: Willi Pfisterer, Alpine Specialist

Taped messages regarding avalanche conditions in Jasper and Banff  
National Parks are available:

Banff	403-762-3600
Jasper	403-852-2425

Environment Canada

Glaciology Division  
Box 313  
CANMORE, ALBERTA TOL OMO

Phone: 403-678-4706

Attn: Ron Perla

Dogs For Avalanche Search - Parks Canada

E. Skjonsberg  
Banff National Park  
BANFF, ALBERTA

Phone: 403-762-3324

A. Burgstrom  
Jasper National Park  
JASPER, ALBERTA

Phone: 403-852-4401

Dogs For Avalanche Search - R.C.M.P.

The following dogs and their masters have received special avalanche  
training:

Chilliwack Sub/Division

Cpl. T.M.A. Barter

Phone: 604-795-9424

Granbrook Detachment

Cpl. G.H. Burns

Phone: 604-426-8422

Courtenay Detachment

Cpl. R.A. Nichol

Phone: 604-338-7421

Nanaimo Detachment

Cpl. F.D. Marino

Phone: 604-754-2345

Nelson Detachment

Cpl. W.T. Murphy

Phone: 604-352-3511

Penticton Detachment

Cpl. W.K. Henderson

Phone: 604-492-4300

Terrace Detachment

Cpl. T.H. Grimm

Phone: 604-635-4911

Vernon Detachment

Cpl. G.R. Gillette

Phone: 604-545-7171

Smithers Detachment

C/O B. Baldwin  
(B.C. Fish & Wildlife)

Phone: 604-847-4411  
Local 261

Regular police dogs with no avalanche training are available at the following locations:

Burnaby Detachment

Cpl. R.J. Sheppard

Phone: 604-294-7922

Cst. R.E. Flack

Phone: 604-294-7922

Cst. K.P. Mead

Phone: 604-294-7922

Cst. R.W. Aspinall

Phone: 604-294-7922

Cst. R.E. Beaudry

Phone: 604-294-7922

Coquitlam Detachment

Cpl. R.J. Elliott

Phone: 604-464-3461

Cst. S.A. Holmes

Phone: 604-464-3461

Mission Detachment

Cpl. C. Millard

Phone: 604-826-7161

North Vancouver Detachment

Cpl. R.D. Clark Phone: 604-985-1311  
Cst. J.D. Brown Phone: 604-985-1311  
(3rd position vacant)

Richmond Detachment

Cpl. C.D. Chapman Phone: 604-278-1212  
Cst. W.D. Crossan Phone: 604-278-1212  
(3rd position vacant)

Surrey Detachment

Cpl. J. Stolarski Phone: 604-574-4122  
Cst. W.J. Rossa Phone: 604-574-4122  
Cst. G.D. Guilteneane Phone: 604-574-4122  
Cst. B.L.M. Spraggs Phone: 604-574-4122

Vancouver International Airport Detachment  
(Explosives Detection)

Cst. W.J. Hamilton Phone: 604-273-2333

Colwood Detachment

Cpl. J.L. MacDonald Phone: 604-388-3123

Fort St. John Detachment

Cpl. D.W. Hobson Phone: 604-785-6617  
C/O T. Grabowski (B.C.  
Fish & Wildlife) Phone: 604-785-4877

Kamloops Sub/Division

Cpl. J.A. Brown Phone: 604-372-3111  
Cst. E.T. Arendt Phone: 604-372-3111  
Cst. T.E. Cyr Phone: 604-372-3111

Kelowna Detachment

Cpl. W.J. Mead Phone: 604-762-3300  
Cst. R.J. Plankenhorn Phone: 604-762-3300

Prince George Sub/Division

Cpl. R.C. Fawcett Phone: 604-562-3371  
Cst. S.D. Grover Phone: 604-562-3371  
(2nd and 3rd positions vacant)

Prince Rupert Detachment

Cst. C.J. Kelly

Phone: 604-624-2136

P.D.S. Supervisor "E" Division  
Vancouver, B.C.

S/Sgt. W.J.O. Regitnig

Phone: 604-732-4511  
Local 289

Provincial Emergency Program

The British Columbia Provincial Emergency Program co-ordinate most local search and rescue groups in the Province. Enquiries can be directed to:

R.E. Neale, Director  
Provincial Emergency Program  
931 Ellery Street  
VICTORIA, B.C. V8V 1X4

Phone: 604-387-5956

B. Thorshaug, Search & Rescue Co-ordinator  
Provincial Emergency Program  
931 Ellery Street  
VICTORIA, B.C. V8V 1X4

Phone: 604-387-5956

Region co-ordinators are located at:

Victoria

Mr. W.C. Dalley  
(Bus) 207-2951 Tillicum Road  
VICTORIA, B.C. V8V 1X4

(24 Hour) Phone: 604-387-3458  
(Unlisted) Phone: 604-386-8523  
(Res) Phone: 604-477-2463

Lower Mainland

Mr. F.G. Clegg (Frank)  
(Bus) 800 Cassiar Street  
VANCOUVER, B.C. V5K 4N6

(24 Hour) Phone: 604-294-8202  
(Unlisted) Phone: 604-294-9714

(Res) 6892 Centennial Drive  
SARDIS, B.C. VOX 1Y0

(Res) Phone: 604-858-9980

Prince Rupert

Mr. J.A. Stott (Jim)  
(Bus) Room 111, Courthouse  
PRINCE RUPERT, B.C. V8J 1B7

(Bus) Phone: 604-624-2121  
Local 237/282  
(After Hours) Phone: 604-624-2126

(Res) 2060 Graham Avenue  
PRINCE RUPERT, B.C. V8J 1C8

(Res) Phone: 604-624-2517

Prince Rupert

Mr. R. Roy (Richard),  
Assistant Regional Manager (Bus) Phone: 604-624-2121  
(Bus) Room 111, Courthouse Local 237/282  
PRINCE RUPERT, B.C. V8J 1B7 (After Hours) Phone: 604-624-2126  
(Res) 209 East 6th Avenue  
PRINCE RUPERT, B.C. (Res) Phone: 604-624-9539

Prince George

B.C.E. Akehurst (Barry) (Bus) Phone: 604-562-8131  
(Bus) 302-1575 Fifth Avenue Local 283/337  
PRINCE GEORGE, B.C. V2L 3L9 (After Hours) Phone: 604-562-8139  
(Res) 753 Faulkner Crescent  
PRINCE GEORGE, B.C. V2M 5E1 (Res) Phone: 604-563-5531

Nelson

E.H. Gower (Ean)  
(Bus) 552 Stanley Street (Bus) Phone: 604-352-2211  
NELSON, B.C. V1L 1N2 (24 Hour) Phone: 604-352-2131  
(Res) 617 Carbonate Road  
NELSON, B.C. V1L 4P6 (Res) Phone: 604-352-7892

Kamloops

M.E. Dyer (Murray)  
(Bus) 315-546 St. Paul Street (Bus) Phone: 604-372-3956  
KAMLOOPS, B.C. V2C 5T1 (24 Hour) Phone: 604-372-3213  
(Res) 2478 Young Street  
KAMLOOPS, B.C. V2B 4M8 (Res) Phone: 604-376-3453

Parks Branch of British Columbia Ministry of  
Lands, Parks and Housing

Parks & Outdoor Recreation Division  
East Kootenay District  
Box 118  
WASA, B.C. VOB 2K0 Phone: 604-422-3411

Attn: Chris Sadleir

Services: a) backcountry information  
b) search and rescue  
c) educational programs



Parks Branch  
MANNING PARK, B.C.

Phone: 604-840-8836

Parks Branch  
(Seymour Mountain and Cypress Park)  
NORTH VANCOUVER, B.C. (Ski Reports)

Phone: 604-929-3911  
Phone: 604-929-2358

Parks Branch  
(Kokanee Creek)  
NELSON, B.C.

Phone: 604-825-4660

Parks Branch  
(Alice Lake)  
BRACKENDALE, B.C.

Phone: 604-898-3024

Kananaskis Provincial Park  
Box 59  
CANMORE, ALBERTA TOL OMO

(Canmore Office) Phone: 403-678-5508  
(Kananaskis Park) Phone: 403-673-3942

Attn: Lloyd Gallagher & Dave Hanna

Services: a) backcountry travel  
b) search and rescue  
c) educational programs

#### Outdoor Recreation Council of British Columbia

Suite 100, 1200 Hornby Street  
VANCOUVER, B.C. V6Z 2E2

Phone: 604-687-3333

#### Atmospheric Environment Service

Equipment: Regional Director  
1200 West 73rd Avenue  
VANCOUVER, B.C. V6P 6G5

Phone: 604-732-4673

Mountain Weather Forecast:

Phone: 604-732-4341

Officer In Charge  
Pacific Weather Centre  
1200 West 73rd Avenue  
VANCOUVER, B.C. V6P 6H9

Phone: 604-732-4163

Attn: Chief Meteorologist

Edmonton Weather Office  
Edmonton International Airport  
EDMONTON, ALBERTA T5J 2T2

Phone: 403-437-1250

Avalanche Films

"Avalanche" 1 hour

Film Library  
Tourism British Columbia  
1190 Melville Street  
VANCOUVER, B.C.

Phone: 604-668-2732

Canada Ski Patrol System

Brian Weightman  
Avalanche Officer  
C.S.P.S. Calgary Zone  
2198 Home Road N.W.  
CALGARY, ALBERTA

(days) Phone: 403-253-7601  
(eve) Phone: 403-286-7245

Services: a) avalanche search and rescue  
b) education  
c) consulting services

First Aid Ski Patrol

P.O. Box 2651  
VANCOUVER, B.C.

British Columbia Ministry of Transportation  
and Highways

G.L. Freer, Head  
Snow Avalanche Section  
940 Blanshard Street  
VICTORIA, B.C. V8W 3E6

Phone: 604-387-1738

District Avalanche Technicians

E. Campbell  
1313 - 6th Street  
HOPE, B.C. VOX 1L0

Phone: 604-869-2401

W. Jamieson  
Main Street, Courthouse  
LILLOOET, B.C. VOK 1V0

Phone: 604-256-4255

D.E. Holmes  
238 - 10th Avenue  
CRESTON, B.C. VOB 1G0

Phone: 604-428-9307

F. Rizzardo  
P.O. Box 490  
STEWART, B.C. VOT 1W0

Phone: 604-636-2410

M. Zylicz  
#300 - 4546 Park Avenue  
TERRACE, B.C. V8G 1V4

Phone: 604-635-6254

The Ministry of Transportation and Highways have trained personnel and rescue equipment on all mountain highways with avalanche problems.

### Ski Areas

Lake Louise Ski Area  
LAKE LOUISE, ALBERTA

Phone: 403-522-3555

Sunshine Ski Area  
BANFF, ALBERTA

Phone: 403-762-2693

Whistler Mountain  
Garibaldi Lift Co. Ltd.  
WHISTLER, B.C.

Phone: 604-681-1014

Red Mountain Ski Area  
Box 939  
ROSSLAND, B.C.

Phone: 604-362-7384

Snow Valley Ski Ltd.  
Box 788  
FERNIE, B.C. VOB 1M0

Phone: 604-423-6041

Attn: David Aikens

Services: a) backcountry travel information  
b) avalanche search and rescue  
c) avalanche safety education

Mt. Washington Ski Area  
4713 Oakridge Drive  
COURTENAY, B.C. V9N 6A7

(Bus) Phone: 604-334-2966

Attn: Dave Cronmiller

(Res) Phone: 604-338-1515

Consultants

David Aikens

Box 59

FERNIE, B.C. VOB 1MO

Phone: 604-423-4847

Services: a) backcountry travel  
b) avalanche search and rescue  
c) avalanche consulting services

Frank W. Bauman

Box 1846

SQUAMISH, B.C.

(Bus) Phone: 604-892-5228

Services: a) education  
b) search and rescue

Mountain Consultants Inc.

Box 258

WHISTLER, B.C. VON 1BO

(Bus) Phone: 604-932-5331

(Res) Phone: 604-894-6994

Attn: Herb Bleuer

Services: a) consulting services  
b) information on backcountry travel

V.G. Schleiss (Fred)

P.O. Box 1585

REVELSTOKE, B.C. VOE 2SO

Phone: 604-837-3012

W.E. Schleiss (Walter)

P.O. Box 1585

REVELSTOKE, B.C. VOE 2SO

Phone: 604-837-3877

Chris Stethem Consulting Ltd.

Avalanche Safety Services

P.O. Box 8

WHISTLER, B.C. VON 1BO

(Bus) Phone: 604-932-3871

(Res) Phone: 604-932-3788

