AVALANCHE NEWS NO. 21

JUNE 1986

EDITORIAL NOTE

The intention of AVALANCHE NEWS is to assist communication between persons and organizations engaged in snow avalanche work in Canada. Short articles cover reports of accidents, upcoming and past events, new techniques and equipment, publications, personal news, activities or organizations concerned with avalanche safety, education and research.

The editor welcomes and expects contributions; all reasonable comments and discussions will be printed. The articles in AVALANCHE NEWS generally reflect the views of the authors, and only when it is specifically stated do they represent the opinion of the Canadian Avalanche Association.

AVALANCHE NEWS is issued three times per year, usually in February, June and October. There is no subscription fee. Requests for copies and notifications of changes of address should be sent to the publisher.

Editor: Peter Schaerer
National Research Council of Canada
3650 Wesbrook Mall
Vancouver, B.C. V6S 2L2

Telephone: (604) 666-6741

Publisher: Geoff Freer
Snow Avalanche Section
Ministry of Transportation and Highways
940 Blanshard Street
Victoria, B.C. V8W 3E6

Telephone: (604) 387-6361

AVALANCHE NEWS
Canadian Avalanche Association, 3650 Wesbrook Mall, Vancouver B.C., V6S 2L2
JUNE 1986
No. 21

SNOW AND AVALANCHE CONDITIONS
1985-1986 WINTER, WESTERN CANADA

by Peter Schaerer

In summary, the winter was unusually long, snowfall and temperatures jumped from one extreme to another, but it was an average winter with respect to total snowfall and number of avalanches.

The amounts of snowfall generally were below normal at low elevations and near to slightly above normal at the high elevations.

Record amounts of snowfall in October formed unusually early snow covers, but the snow densified well under high temperatures at the end of the month. The October snowfalls were followed by very cold weather and drought conditions in November and early December. The conditions in this first part of the winter demonstrated well the influence of the snow density on the rate of snow metamorphism. Although one expected the 50 cm to 80 cm deep snow to change rapidly towards facetting and depth hoar under the low temperatures and strong temperature gradients, the high density snow actually changed very slowly. Even in the Rocky Mountain area the common depth hoar was absent or under-developed. The loose snow at the surface, however, changed into large facetted crystals and very strong winds transported it from exposed slopes. In December and the first part of January, minor snowfalls accompanied by warm weather produced a dense (specific gravity 0.3 to 0.4), hard layer on top of the loose November surface. Avalanches were rare before January because snowpacks barely had reached critical depths.

The loose snow surface from November overlain by a hard, dense layer, surface hoar and strong winds set the conditions for unstable snow together with a major snowfall that arrived on January 18, 1986. The snow stability was highly variable. Often it was difficult to predict where avalanches could be expected. Generally the conditions were worse at low elevations where it had been colder in November and December and wind had not removed the loose snow. In other areas the unstable snow was confined to a narrow elevation band, a westerly exposure, or locations with a shallow snow cover.

A major storm with heavy precipitation and warm air on February 23-26, 1986, produced avalanches in most of the regular paths and removed the unstable snow on most slopes in southern British Columbia. Deep, unstable snow remained on selected slopes in the Rocky Mountains and northern British Columbia.

Light snowfall in March and mild temperatures were unable to regenerate deep instabilities and large avalanches. The months of April and May were cool and had high amounts of precipitation extending the avalanche season well into May. Natural dry snow avalanches of size 3 were observed until May 14, 1986.

AVALANCHE INVOLVEMENT IN CANADA
1985-1986 WINTER

by Paul Anhorn
National Research Council
Revelstoke, B.C.

The Avalanche Centre of the National Research Council received reports of 28 incidents when persons on equipment were involved in avalanches. Probably more persons than reported were caught and partially buried in avalanches.

Number of Incidents

- 14 incidents involved skiers in or near a ski area;
- 9 incidents involved backcountry skiers;
- 1 incident involved a group of snowmobilers;
- 2 incidents involved moving traffic on highways;
- 1 incident involved a hunting party in the backcountry;
- 1 incident involved rail traffic.

Persons Involved

- 10 persons were caught but remained on surface;
- 16 persons were partially buried;
- 4 persons were completely buried and rescued alive;
- 7 persons were completely buried and found dead;
- 1 person was partially buried and found dead.

Of the persons who were completely buried and survived:

- 2 were found by articles on the surface;
- 1 was buried 30 cm deep and was able to dig himself out;
- 1 was found by digging by members of his party.

Of the persons who were recovered dead:

- 2 were found by transceiver;
- 5 were found by organized rescuers using probes.

Vehicles

- An avalanche struck a 60-car freight train, derailing three loaded cars and two cabooses.
- A fully loaded transport truck was moved by an avalanche 150 m on an air cushion. The truck landed on its side and was demolished.
- Three vehicles were partially buried.
- One oversnow vehicle was buried and damaged.

Other

- 1 packhorse was partially buried and lifted out by a helicopter;
- 1 horse was buried, had its head trapped under the snow and died.

Fatal Accidents

1. On January 25, 1986, two backcountry skiers were skiing on White Queen Mountain just outside the Whitewater Ski Area near Nelson, B.C. After making runs on the north side of the mountain they decided to ski a south-western exposure for their final descent. At 1540 hours the first skier released an avalanche, but his friend waiting above a convex roll did not observe it. After the second skier noticed the fracture line he carefully entered the avalanche path from the side, turned his transceiver to receive, proceeded downhill and found the victim on the uphill side of a tree with one leg exposed, but dead from internal injuries. The body was removed the next day.

2. On February 4, 1986, two members of a helicopter skiing party died in the Selkirk Mountains near Nakusp, B.C. One guide and two clients were caught when an avalanche released more than 100 m above them. It was the third run down the slope and the group of 12 had tracked the slope well previously. The avalanche deposit formed two arms with one victim in each. A third skier was found alive with injuries. Both victims were located by transceiver, one within 10 minutes; the other, who was buried deeper, after more than 30 minutes.

3. On February 17, 1986, there was an accident two kilometres south-west of the Coquihalla Lakes, near the summit of the Coquihalla Highway. It involved two people who were travelling on snowshoes with their skies strapped to their packs. They were walking on a small bench beneath a slope which they intended to ski when a size 2 avalanche came from above. Both skiers were buried. One managed to dig himself out and search for his partner using his skis as probes. When he could not locate him he skied to the road (200 m vertical), drove his truck to the nearest phone (one kilometre) and called the R.C.M.P. for help. Ministry of Highways avalanche crews performed the rescue and uncovered the victim 50 minutes later, 1 hour and 40 minutes after the burial. Attempts to revive him failed.

4. On March 29, 1986, a group of 11 snowmobilers were caught in a snowstorm that brought down an avalanche, burying six of them. They were on a holiday snowmobiling expedition 50 km south of Valemount, B.C. Strong winds, 45 cm of new snow and high temperatures created a highly unstable snowpack. The avalanche broke in the snow, then stepped down to one metre below the surface. It ran 500 vertical metres and was one kilometre wide.

   The group of snowmobilers was spread out in the valley bottom when the avalanche released. Two members of the group were dug out very quickly by their friends. A person reported the accident to the police who organized the rescue: 25 rescue personnel from R.C.M.P., National Parks and local helicopter ski companies. Within seven hours two victims were uncovered and the search had to be called off half an hour after dark. The next day, the rescuers, using metal detectors and dogs, worked for five hours before they found the bodies of the last two victims under four metres of snow. They were located by probing.

GUIDELINES FOR WEATHER, SNOWPACK AND AVALANCHE OBSERVATIONS

by Peter Schaerer

Re-examination

As reported in AVALANCHE NEWS NO. 19, a Committee has been charged with the re-examination of the Guidelines for Weather, Snowpack and Avalanche Observations published by the National Research Council.

The Committee members (Walter Schleiss, Janice Johnson, Jeff Boyd and Peter Schaerer) have examined the value of observations, descriptions of their discrepancies and terminology, and have recommended a few modifications, additions and deletions. They wish to notify users about these changes and invite comments by July 20, 1986. The Guidelines will be reprinted during the summer of 1986 and hopefully will be ready for the 1986-1987 avalanche season.

In this context it should be mentioned that the International Commission on Snow and Ice of the International Association of Hydrological Sciences (IAHS) has appointed a Committee to review the International Classification of Snow. The Committee is chaired by Sam Colbeck of CRREL at Hanover, New Hampshire, and Dave McClung of the National Research Council of Canada is a member. Because the Canadian guidelines for snow profile observations are based on the International Classification for Snow, adjustments may be necessary in the future. The International Commission on Snow and Ice will have its recommendations ready at the earliest in 1987, and the Canadian Avalanche Association will consider them with the next re-examination of the Guidelines.

The following major proposed modifications of the Canadian Guidelines are listed. In addition, the new edition will contain editorial changes.

Foreword and Introduction

It will mention the responsibility of the Canadian Avalanche Association in writing the Guidelines, the schedule and criteria for re-examination, and that the number of observations may be adjusted to operational needs.

Snow and Weather Observations

Page 1: Objectives

Addition: "The observations are applicable to operations at a fixed location. Operations that do not work from a permanent location, for example, in guiding make regularly a reduced set of observations.

Page 3: Sky Condition

"Partly Cloudy" changed to "Scattered Clouds". "Cloudy" changed to "Broken Clouds".

Comment added: "The cloud condition is classified by the cover and not the opacity. Thin clouds forming a hazy sky must be classified as clouds; for example, a sky completely covered with thin clouds must be reported as overcast, not haze".

Page 4: Precipitation Intensity

Addition: FR = Freezing Rain
*R = Mixed Rain and Snow

Page 4: Air Temperature

Addition: "Indicate the trend of temperature shown on the thermograph with an arrow".

Page 5: Weight of New Snow

Addition: "Determine the weight of new snow when the depth is greater than 3 cm".

Page 7: Foot Penetration

Addition: "Measure the depth of the footprint to the nearest centimetre".

Page 9: Barometer

Deletion: "Very High" and "Very Low".

Surface Condition

Addition: "Record the type of snow on the surface by one of the following (symbols to be added):

loose dry
loose wet
wind crust
crust from rain, sun
surface hoar"

Comments for general use: Write "-" (dash) when no observation was made. Write "0" (zero) when the reading is zero, for example, when no new snow was deposited on the board.

Snow Profile

Page 13: Section 5.4

Note that the air and surface temperatures are to be read to the nearest 0.5°C.

Page 14: Section 5.4 (d)

Deletion of the classification of the surface roughness.

Page 14: Section 5.4 (e)

Deletion: "ski penetration".

Page 14: Section 5.5

New wording: "Measure the first snow temperature 10 cm below the surface. The second temperature is observed at the next multiple of 10 cm from the ground. From there temperatures are observed at intervals of 10 cm to a depth of 1.4 m and at 20 cm intervals below the 1.4 m depth. Measure the snow temperatures at closer intervals when needed; this may be the case when the gradients are strong or when temperatures are close to 0°C".

Page 15: Section 5.8

Addition at bottom of page:

"Melt-freeze particles.	0.	Grain clusters after several melt-freeze cycles, amorphous grain".

Page 16: Section 5.9

Additional comment: "d) New snow may be sub-classified into the different forms of solid precipitation according to the International Classification for Snow. The graphic symbols of that classification would replace the symbol + for new snow".

Page 20: Deletion of the second paragraph: "The accurate determination...".

Page 20: Addition of a short section on fracture line profiles.

Test Profiles

Under "Objectives" follows a statement that there is no fixed rule about the type and amount of information that must be collected.

Ram Profile

Addition: "Ram profiles must be plotted. The profile on page 22 contains the ram profile recorded on page 30".

Shear Frame Test

No changes.

Shovel Shear Test

The section "Application" and added comments will reflect that the primary objective is to identify potential shear planes in deep layers, but that the test is not a stability test.

The procedure will prescribe the cutting of two blocks or columns. One is to be tested by shearing off the snow in sections with depths a little longer than the length of the shovel, the other one by cutting the full depth at the back and either pushing with the shovel or tilting and tapping it.

Observation of Avalanches

Section 2: Format

Addition: "The amount of information that must be collected depends on the type of operation".

Section 5.2 Deletion of first sentence at top of page 42: "Write N into the column...".

Section 5.4 Second paragraph - new wording: "Where applicable estimate also the area affected by the avalanche relative to the total area that could contribute avalanche snow. Express the relative area in percent".

Section 6.1 Addition: "Operations may add other triggers that would apply to their specific conditions".

Section 6.6 New wording: "Code N. The avalanche started as new snow on an old snow surface".

"Comment: New snow contains all snow deposited during a recent storm".

Avalanche Involvement Reports

No changes.

AVALANCHE RESCUE TRANSCEIVERS

Frequencies

The Canadian Avalanche Association wishes to draw the attention of the readers to the developments with respect to avalanche rescue transceivers. Presently in Europe, where about 90% of rescue transceivers are marketed, instruments are available with the 2275 Herz frequency, the 457 KiloHerz frequency or both frequencies combined. The International Committee on Alpine Rescue (IKAR) is committed to resolving the conflicts of frequencies and will decide on the adoption of a standard single frequency in October 1986. After extensive discussions and tests in the past few years, it is almost certain that all of Europe will switch to 457 KHz. This leaves Canada and the U.S.A. in a dilemma because the 2275 Hz frequency is used on this continent almost exclusively.

With the present situation, North American users will be able to continue using the 2275 instruments - for example, Skadi, Pieps 2 and Echo - for several years to come. Local markets probably will be flooded with low-cost surplus instruments from Europe after the IKAR has made a decision on the 457 KHz frequency, but in the future (five years from now), we might be able to import 457 KHz instruments only. In view of the small North American market, it is questionable as to whether or not local manufacturers can continue to produce 2275 Hz instruments at competitive prices.

The Canadian Avalanche Association discussed the problem at the meeting on May 16, 1986, and wishes to draw the attention of all purchasers of new transceivers to these changes. Purchasers of single 2275 Hz frequency transceivers should be aware that their instrument might be obsolete and non-compatible with other units several years from now. Those who want to make a long-term investment should buy dual frequency instruments such as Ortovox and Pieps DF. The 457 KHz frequency will probably come to this continent whether we like it or not.

It should also be mentioned that the principal advantage of the 457 KHz frequency over the 2275 Hz is a longer range of transmission and reception (about 100 m vs 30 m).

Does the Transceiver Increase the Chance of Survival?

This question was investigated by P. Föhn and H. J. Etter of the Federal Institute of Snow and Avalanche Research at Davos, Switzerland. They analyzed avalanche accidents in Switzerland between 1974 and 1984 (realizing that not all accidents and avalanche burials with a successful rescue were reported and contained in the statistics).

In 97 incidents with 140 completely buried persons who carried no transceivers, 35 (25%) persons were found alive and 105 (75%) could not be rescued alive. This means about 25% of the buried persons were rescued by probing, dogs, digging, organized rescue, etc.

In another sample containing 36 incidents with 66 complete burials with transceivers, 23 (35%) persons could be saved and 43 (65%) persons were uncovered dead. Wearing a transceiver and using it properly increased the chance of survival by at least 10%. The actual chance of survival is suspected to be greater because additional successful rescues by transceivers probably went unreported.

The numerous people wearing transceivers and found dead (more than half) also prove that transceivers are not life insurance. Noteworthy in this context is that no completely buried person wearing a transceiver was saved by an organized rescue party. Live recoveries were possible only when rescue means (transceivers, shovels) were at the accident site immediately.

Reference: P. Föhn and H. J. Etter: Verbessert das Kameraden-VS-Gerat die Uberlebenschancen bei Lawinenunfallen Mitteilungen of Federal Institute of Snow and Avalanche Research No. 39, November 1985; 5 p.

MOUNTAIN WEATHER FORECAST

reported by Peter Schaerer

The Pacific Region Mountain Weather Committee held its annual meeting at the Pacific Weather Centre on May 21, 1986. The Committee consists of staff of the Atmospheric Environment Service, representatives of the avalanche safety industry in Western Canada - highways, ski areas, helicopter ski operators - and a member of the University of British Columbia. The membership is not fixed and in practice the meetings are attended by those who have an interest and are available.

At the May 21, 1986, meeting, the format, timing and content of the Mountain Forecast Guidance was reviewed and found adequate (see AVALANCHE NEWS NO. 19). No changes are planned for the 1986-1987 winter. It must be pointed out that the guidance provides a general picture of the weather only and forecasts in greater detail must be obtained by contacting the local weather offices.

Because the Government of Canada is committed to recovering the costs of many activities, certain weather services that benefit private industry may have to be paid for in the future. At this time it is not clear how this policy will affect the distribution of the Mountain Forecast Guidance and the regular contacts with the local weather offices.

One-day weather forecasting courses are planned again this year. The courses will concentrate on problem solving; therefore, the participants will have to prepare themselves before the course by studying the handout material from previous courses. The tentative dates and places are:

November 7, 1986	Vancouver
November 13, 1986	Golden or Revelstoke

Those who wish to receive detailed information when it is available and wish to register should contact Peter Schaerer (address on front page of AVALANCHE NEWS).

TECHNICAL MEETING OF THE CANADIAN AVALANCHE ASSOCIATION

by Paul Anhorn
National Research Council
Revelstoke, B.C.

The members of the Canadian Avalanche Association met for their annual exchange of information on May 15-16, 1986, in Kelowna, B.C. Following is a summary of the discussions.

Review of Avalanche Safety Programs

Canadian Mountain Holidays

Jeff Boyd outlined the Canadian Mountain Holidays heli-ski operation. Canadian Mountain Holidays has six areas, each over 3,000 km^2. All ski runs are classified with respect to hazards and every morning the guides review the hazard list and discuss the runs of the day. Weather observations are taken regularly at base stations and at high elevations. The information is exchanged daily between operations. The 35 guides have an average of 9.3 years' experience with Canadian Mountain Holidays.

Whitewater Ski Area

Tom Van Alstine explained the Whitewater Ski Area Safety Program. Whitewater's high snowfall creates direct action avalanches. The avalanches are mostly controlled by hand charges and ski cutting, and some larger avalanche paths are controlled with an Avalauncher. Patrollers also give advice to ski tourers who use the ski area as a base for their excursions into the backcountry.

Mike Wiegele Cariboo Helicopter Skiing

Mike Wiegele's heli-ski safety program was reported by Erich Schadinger. Like Canadian Mountain Holiday's operation, their decision is based on daily weather observations, snow profiles and communication between the guides. All the observations are recorded on a chart. Last winter they noticed some avalanches which ran unusually long distances.

Coquihalla Highway

Jack Bennetto outlined the Coquihalla Highway avalanche program. The road location was developed over a ten year period. One snowshed, several diversion dams and mounds were built to reduce the avalanche hazard. Other hazard areas will be protected by artillery and avalanche control ropeways. A crew of four men is planned for the winter months.

All four speakers gave presentations on a highly professional level with interesting facts. The members of the Canadian Avalanche Association thank them for their talks.

Investigation of Accidents

Alan Askey, Chief Coroner of British Columbia, and Ian McKichan, Coroner at Kamloops, B.C., attended the meeting. They outlined the role of the coroner's service and how inquests are conducted. As a result of the discussion that followed, Roger McCarthy was asked to form a Committee to set guidelines for experts who investigate accidents.

The Canadian Avalanche Association will assist the Coroners with avalanche accident investigations and will submit to the Chief Coroner a list of recommended experts.

Avalanche Program of the National Research Council

Peter Schaerer outlined the new policies of the National Research Council. In the future, the transfer of technology will be stressed to a greater extent and the research will be more mission-oriented than in the past. This will mean a continuing strong co-operation between the industry concerned with avalanche safety and the National Research Council avalanche work.

Peter summarized the results of the current and past avalanche research work of the National Research Council, mainly with respect to the development of information that must be used for the solution of engineering problems.

Other Topics

Other topics that were discussed included avalanche courses, observation guidelines, weather forecasts and transceiver frequencies. These topics are reported under separate headings in this issue of AVALANCHE NEWS.

BUSINESS OF THE CANADIAN AVALANCHE ASSOCIATION

The Annual General Meeting and Directors' Meeting were held in Kelowna, B.C., on May 16, 1986. The Directors elected for 1986-1987 are:

Fred Schleiss	President
Willi Pfisterer	Vice-President
Peter Schaerer	Secretary-Treasurer
Scott Flavelle	Membership Committee
Brian Leighton	Director at Large
John Tweedy	Director at Large
Garry Walton	Associate Members

The Association has 62 active and 18 associate members. New active members are Scott Flavelle, Karl Klassen, Scott Rowed, Robert Bauman, Robin Siggers. The new associate member is Kootenay Helicopter Skiing Ltd.

The Association accepted new by-laws that allow membership for inactive, retired and honorary members. The Association, with representatives of each industry, plans to organize a press conference or a press release in Vancouver, Calgary and Edmonton at the beginning of next winter to promote the activities of its members.

AVALANCHE COURSES
NATIONAL RESEARCH COUNCIL/B.C. INSTITUTE OF TECHNOLOGY/ CANADIAN AVALANCHE ASSOCIATION

by Peter Schaerer

Courses for personnel of operations concerned with avalanche safety were held in the winter of 1985-1986 as follows:

Date	Location	Type	Number of Participants Registered	Passed
Nov. 25-29/85	Creston	Transportation & Industry-Level 1	17	17
Dec. 2-6/85	Creston	Transportation & Industry-Level 1	24	24
Dec. 7-13/85	Whistler	Ski Operations-Level 1	29	29
Jan. 12-19/86	Mt. Assiniboine	Ski Operations-Level 1	21	21
Jan. 19-26/86	Mt. Assiniboine	Ski Operations-Level 1	21	21
Jan. 20-27/86	Lake Louise West	Ski Operations-Level 2	29	26

The instructors and administrators reviewed last winter's courses on May 15, 1986, and came to the following conclusions:

a) During the 1986-1987 winter the same number of Level 1 courses will be held at the same locations as in 1985-1986.

b) A lesson on weather forecasting will be added to the curriculum of the Level 1 courses.

c) It is planned to add a chapter on route finding and decision making to the course book.

d) The field books are too cumbersome and will be cut in size in the future.

e) The content of the Level 2 course has not entirely met the requirements of the industry. As a result, a Committee under the chairmanship of Chris Stethem was appointed to review and re-design the Level 2 courses. Special attention will be given to the student evaluation system. The Committee plans to meet in June.

Those who wish to receive the 1986-1987 course brochure (available in October) should contact:

Part-time Programs
School of Engineering Technology
British Columbia Institute of Technology
3700 Willingdon Avenue
Burnaby, B.C.
V5G 3H2

Telephone: 604-432-8637

COURSE FOR HELICOPTER SKI GUIDES

submission by Canadian Mountain Holidays Heli-skiing

Canadian Mountain Holidays Heli-skiing will conduct a seven-day seminar for lead guides of helicopter ski operations.

Date: December 6-13, 1986

Location: Bugaboo Lodge in Purcell Mountains

Cost: approximately $2,000.00 per participant

Topics covered:
- Snow Safety
- Avalanche Control
- Rescue (including resuscitation)
- Heli-sling Evacuation
- Mountain Weather Forecasting

Tentative course instructors:
- Ed LaChapelle
- Peter Schaerer
- Chris Stethem
- Tim Auger
- Clair Israelson
- Richard Marriott

Registration and information:
Kobi Wyss
Canadian Mountain Holidays Heli-skiing
P.O. Box 1660
Banff, Alberta
T0L 0C0

Telephone: 403-762-4531

FORTHCOMING MEETINGS

International Symposium on Avalanche Formation, Movement and Effects

September 14-19, 1986
Davos, Switzerland

The purpose of the Symposium is to provide an opportunity for the discussion of new experimental and theoretical findings of aspects of snow, avalanche formation, movement, forecasting and protection.

A large number of registrations have already been received. The presentation of four review papers, 47 regular papers and 28 posters are scheduled.

Correspondence should be addressed to:

Prof. C. Jaccard
Swiss Federal Institute for Snow and Avalanche Research
CH 7260 Weissfluhjoch
Davos, Switzerland

International Snow Science Workshop

October 22-25, 1986
Lake Tahoe, California

The theme of the workshop is "a merging of theory and practice". The workshop is the meeting of all those involved in avalanche work on this continent.

Registration fee is $55.00 U.S.

Address for registration and information:

ISSW Conference Committee
P.O. Box 567
Homewood, California 95718
U.S.A.

PUBLICATIONS

Betsy Armstrong and Knox Williams, 1986

The Avalanche Handbook. Fulcrum Inc., 350 Indiana, Golden, Colorado 80401; telephone 303-277-1623. Price $14.95 U.S. plus $1.25 for shipping and handling.

The book is a non-technical description of snow avalanche science, protection, survival and lore. Topics include the basic what's, why's and where's of properties of snow which contribute to avalanche formation, triggers and effects. Also discussed are solutions to avalanche problems, decision making, minimizing risk, survival methods, rescue, legal considerations and current research. Avalanche incidents, mainly from the United States, are used as examples throughout the text.

The book, written for anyone with an interest in the subject, is a fascinating introduction for the beginner and makes light entertaining reading for the experienced. It is a welcome modern counterpart for North America to Colin Fraser's book on avalanches in Europe, although one wishes the authors had mentioned avalanches in Canada more frequently.

Jill A. Fredston and Doug Fesler, 1985

Snow Sense. A Guide to Evaluating Snow Avalanche Hazard. Division of Parks and Outdoor Recreation, Alaska Department of Natural Resources, P.O. Box 7-001, Anchorage, Alaska 99510; 48 p. Price $3.50 U.S.

The publication is a revised edition of the pocket book which summarizes the significant considerations for recognizing, evaluating and avoiding avalanche hazards in backcountry activities. It contains practical tips for making observations during travel.

Peter Schaerer

CHANGE OF ADDRESS

The Avalanche Centre of the Institute on Research in Construction (formerly Division of Building Research) of the National Research Council has moved to the campus of the University of British Columbia.

New address: 3650 Wesbrook Mall
Vancouver, B.C.
V6S 2L2

The telephone numbers have not changed and are:

Peter Schaerer	604-666-6741
Dave McClung	604-666-8046

The new address is also the business address of the Canadian Avalanche Association.