

AVALANCHE NEWS NO. 24

JUNE 1987

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 of 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 reflect the views of the authors, and only when it is specifically stated do they represent the opinion of the Canadian Avalanche Association.

No paid advertisements are carried. Suppliers who wish to draw attention to their products should send information to the editor who will publish a note when the equipment has value in avalanche work and safety.

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AVALANCHE NEWS
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SNOW AND AVALANCHE CONDITIONS
1986 - 1987 WINTER, WESTERN CANADA

by Peter Schaerer

Above normal temperatures continuously from December until May were the most significant feature of the winter of 1986 - 1987. The total snowfall was normal to slightly above normal on the Pacific Coast and in Northern British Columbia but below normal in the Interior and the Rocky Mountains. The moderate amounts of snowfall combined with the high temperatures produced snowpacks that in general were more stable than usual. Fewer avalanches than in an average winter were observed in the Southern areas and the avalanche activity was about normal in the North. Few destructive avalanches were reported.

Snowfalls in October and November produced a well-settled snowpack that allowed many ski areas to open early. Advances of cold arctic air to the South were few and short. A persistent high pressure ridge over Southern British Columbia in December, January and February deflected the warm south-westerly air flows along the Pacific Coast to the North. This produced rain at the low elevations and heavy snowfall at the high elevations of the South coast, Vancouver Island and Northern British Columbia, but dry weather in the Columbia Mountains and the Rocky Mountains. For many locations, February 1987 was the driest month of February on record.

The snow that fell in December, January and February stabilized rapidly. Surface hoar and faceted surface snow that formed between snowfalls usually was removed by wind or destroyed by rain and warm air before it was buried. This, together with above average air temperatures, resulted in dense snow packs that contained no deep instabilities. Natural avalanches occurred when new snow slid on old stable snow. The size of these avalanches was rarely greater than three. Strong winds produced unstable snow on selected slopes, however. Several unsuspecting skiers and snowmobilers were caught in avalanches on such freakish slopes.

The weather pattern changed at the end of February. The air flow became zonal bringing heavy precipitation to the Columbia Mountains and, to some extent, to the Rocky Mountains, but the temperature continued to be high with freezing levels climbing to 2,000 m. March 3rd to 7th was the most active period of avalanche activity for the winter. Dry and wet snow avalanches were observed in almost all areas. Cold and clear weather following the warm, wet first week of March produced crusts and surface hoar which in mid-March were covered with up to 50 cm of new snow deposited in several minor snowfalls. The unstable condition that resulted from this persisted for an unexpectedly long time at the high elevations. The instability was finally removed with warm weather around April 1st.

April was another month with above normal temperatures and light precipitation except for the North Coast. A storm in the last few days of the month caused unstable snow and avalanches at elevations above 2,000 m. The continuing warm weather caused rapid melting and a quick depletion of the snowpack at the low elevations.

AVALANCHE INVOLVEMENT IN CANADA
1986-1987 WINTER

by Paul Anhorn
National Research Council
P.O. Box 2759, Revelstoke, B.C., V0E 2S0

By May 7th the Avalanche Research Centre of the National Research Council had received reports of 28 incidents when persons or equipment were involved in avalanches. Experience suggests that the actual number probably is double since many avalanche encounters, particularly those in the backcountry, go unreported. Unreported avalanche involvements usually have no serious consequences.

Number of Incidents

14 incidents involved skiers in or close to a ski area;
12 incidents involved backcountry skiers;
1 incident involved snowmobilers;
1 incident involved damage to equipment.

Of these incidents 9 occurred in the Rocky Mountains, 14 occurred in the Interior Ranges of British Columbia and 5 occurred in the Coast Mountains and Vancouver Island.

Persons Involved

19 persons were caught but remained on surface;
20 persons were partially buried and not injured;
3 persons were partially buried and injured;
4 persons were completely buried and rescued alive with the use of transceivers; all of them were found and uncovered within five minutes;
1 person was completely buried and found by digging alone in three minutes;
7 persons were completely buried and found dead (by transceivers).

Fatal Accident

Only one accident with death occurred, but it took the lives of seven persons. On 23 March, 1987 seven skiers who were flown by helicopter to the top of a ski run near Blue River, B.C. were caught in an avalanche. They were completely buried and died from asphyxiation. The investigations concerning this accident have not been completed, and therefore no detailed information is available.

Property Damage

A size 2.5 avalanche of damaged the steel towers of hydro-meteorological instruments at the Upper Wolf River Snow Survey Station on Vancouver Island.

Acknowledgement

These statistics could not have been compiled without the co-operation of park wardens, avalanche technicians, ski patrollers, guides, educators, private skiers and climbers. We wish to thank all those who have made an effort to submit a report. The file remains open and additional reports of avalanche encounters in this past winter and during the summer will gladly be received.

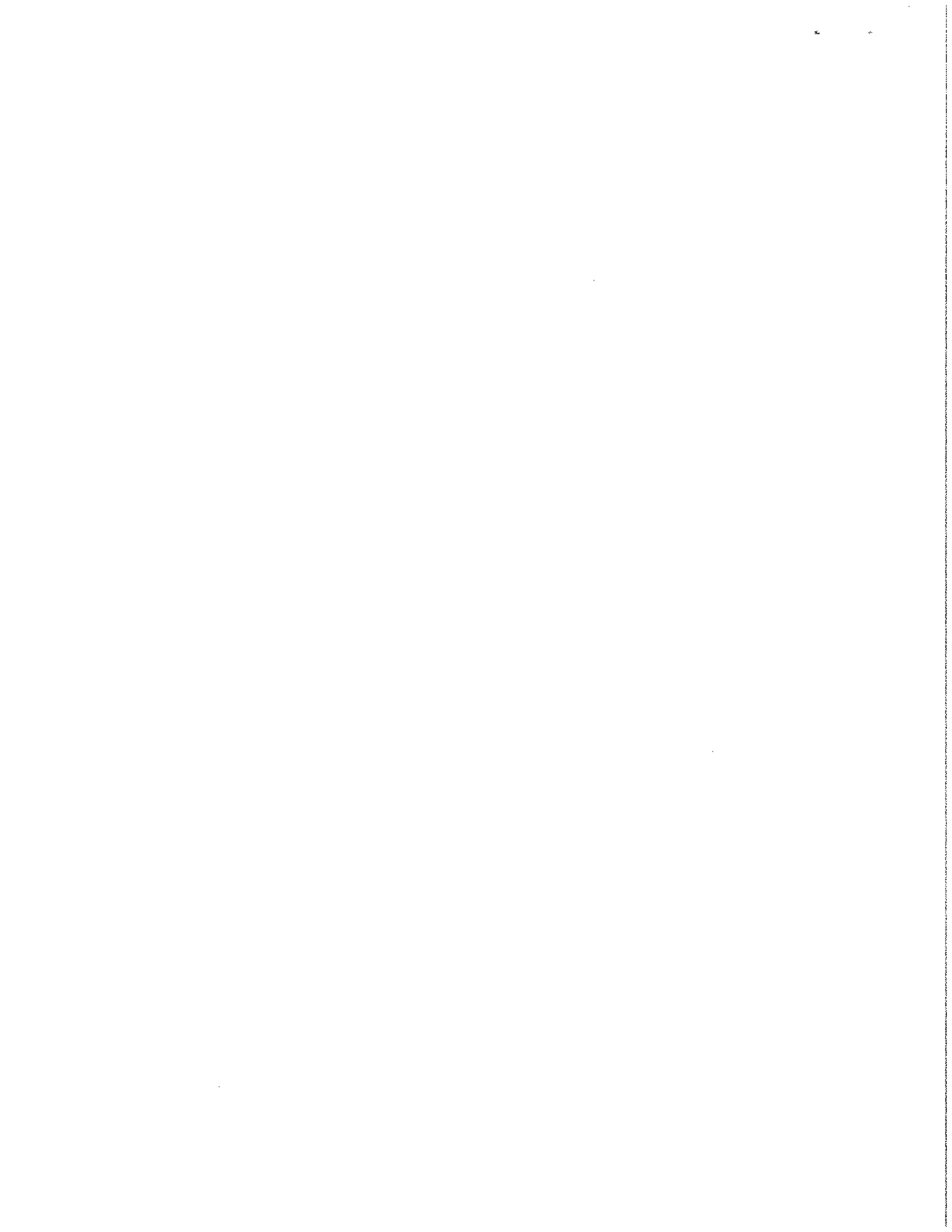
Avalanche Fatalities In Other Countries

Following is a table of the number of fatalities for the previous winter 1985-1986 in the member countries of the International Committee on Alpine Rescue (IKAR).

STATISTICS OF AVALANCHE FATALITIES - OCTOBER 1, 1984 TO SEPTEMBER 30, 1985

Compiled by I.K.A.R.
Avalanche Subcommittee

Country	Number of Members Accidents	Fatalities						Total	Number of Avalanche Dogs
		Ski Touring	Mountain Climbers Without Skis	Skiers Leaving The Controlled Ski Area	On Workers	Highways	Buildings		
Switzerland	41	22	5	7	-	-	-	34	328
France	59	20	4	14	-	-	2	40	144
Austria	66	26	2	4	1	-	1	43	220
Italy	21	11	-	4	-	1	8	27	170
Germany	7	2	-	-	-	-	-	2	45
Yugoslavia	-	-	1	-	-	-	6	8	34
Liechtenstein	-	-	-	-	-	-	-	-	8
Poland	-	-	1	-	-	-	-	1	12
Czechoslovakia	-	-	-	-	-	-	-	-	-
Spain	-	4	-	-	-	-	-	4	-
Norway	-	1	1	-	-	-	-	22	93
Bulgaria	-	-	-	-	-	-	-	-	30
Canada	-	4	-	-	-	-	-	8	38
U.S.A.	-	9	-	1	2	3	-	15	45
England	4	-	2	-	-	-	-	2	37
TOTAL	198	99	16	30	3	4	9	18	1,204



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, 1987. The committee members in attendance were staff of the Atmospheric Environment Service and representatives of ski areas, British Columbia Ministry of Highways and the National Research Council.

The Committee found that the format and timing of the mountain weather forecast in this past winter were satisfactory and resolved that no changes should be made in the winter of 1987-1988. The representatives of the Atmospheric Environment Service stated that they would like to obtain more feed-back from the users about the quality and the impact of the forecast. In particular, information would be valuable on how avalanche safety and control benefit from the forecasts. An appreciation of the forecasting product would assist future funding and services by the Atmospheric Environment Service.

The importance of co-operation between avalanche safety operations and the local weather offices was stressed. The avalanche control staff at ski areas, B.C. Ministry of Highways, helicopter ski operations, industries, etc. are encouraged to visit their nearest weather office (W04), meet in person the forecasters and briefers and in turn invite the weather office staff for a visit to the avalanche areas.

The Committee discussed the seminars that were held in the past four years for users of the mountain weather forecast and resolved that a workshop with topics of an advanced level should be held. A subcommittee was charged with the task of organizing such a workshop. Members of the organizing committee are representatives of the Pacific Weather Centre of the Atmospheric Environment Service, the weather services of the Atmospheric Environment Service, the British Columbia Ministry of Transportation and Highways, ski areas, and the National Research Council. The workshop is tentatively planned for November 1987, and information about the event will be mailed to those on the address lists of Avalanche News and the BCIT avalanche courses.

Workshop discussion topics suggested at the meeting on May 21 are:

- interpretation and use of the forecast products;
- obtaining the most benefit from the information;
- accuracy of the weather forecasts;
- advanced knowledge on weather.

At this time, the Mountain Weather Committee requests that users of the mountain forecast;

- a) suggest additional topics and speakers,
- b) indicate their interest in such a workshop by announcing the number of probable attendees and suggesting a preferred location (the workshop will be held at one location only, not at Vancouver and another place in the Interior as in the past years).

Please reply to one of the following members of the Committee:

- a) Vello Puss, Pacific Weather Centre, Atmospheric Environment Service, 1200 West 73rd Avenue, Vancouver, B.C., V6P 6H9; telephone 666-2728.
- b) Kel Fenwick, Whistler Mountain Ski Corporation, Box 67, Whistler, B.C., V0N 1B0; telephone 932-3434.
- c) Peter Schaerer, National Research Council, 3650 Wesbrook Mall, Vancouver, B.C., V6S 2L2; telephone 666-6741.

CANADIAN AVALANCHE ASSOCIATION

The Canadian Avalanche Association held its annual meetings on May 6 and 7, 1987, at Kelowna, B.C. Following is a summary of the business that may be of interest to the readers of Avalanche News.

The directors for 1987 - 1988 are:

Chris Stethem - President
 Walter Schleiss - Vice-President
 John Tweedy - Secretary-Treasurer
 Scott Flavelle - Chairman of Membership Committee
 Brian Leighton - Director at Large
 Tim Auger - Director at Large
 Garry Walton - Representative of Associate Members

On May 8, 1987 the Association had 76 active and 20 associate members. New active members are Buck Corrigan, Phil Hein, William Devlin, Ken Hammell, Bruce McMahon, Larry Hergott, Erich Schadinger, George Field, Rod McGowan, Rick Schroeder, Alan Evenchick, Gordon Bonwick. New associate members are the Canadian Avalanche Rescue Dog Association, Promet Environmental Group Ltd., and Mountain Equipment Cooperative.

The members discussed at length the intent and content of the Guidelines for Weather, Snowpack, and Avalanche Observations. They found that it is difficult to standardize the frequency and type of observation that must be carried out at operations. A committee was elected for the purpose of examining the Guidelines and reporting to the members.

An educational video tape on avalanche terrain was presented. It was produced by Art Twomey and Peter Schaerer with the assistance of Kootenay Cable T.V. The members of the Avalanche Association were in favor of producing additional similar training aids and voted the necessary funds. Topics suggested are weather observations, mountain weather, snow profile observation, search and rescue. A committee with members Rod Pendlebury, Art Twomey, Jim Bay, and Al Schaffer was assigned to make proposals for the production of future video tapes.

Darro Stinson reported on studies by Willi Pfisterer about the most effective method for digging out buried avalanche victims.

Representatives of the ABS avalanche balloon survival system and RECCO systems introduced and demonstrated their products.

In September, 1986, a working group under the direction of Chris Stethem reviewed the design and content of the Level 2 professional avalanche courses to ensure that they will satisfy industry needs. The report of the working group was discussed and amended at the meeting on May 7.

The revised description of the pre-requisites for course participants, standards, rating system and list of instructional topics will be mailed to all members of the Canadian Avalanche Association.

AVALAUNCHER PROJECTILE TECHNOLOGY

Submitted by E. Sitnam - President
E.S. Mantis Research Corp.
370 East Esplanade
North Vancouver, B.C., V7L 1A4

I would like to provide the Canadian Avalanche Association with the following update on our research.

Prior to the submission of a comprehensive unsolicited proposal to the Department of Supply and Services in Ottawa last November for the research and production of a fully Canadian product, E.S. Mantis Research Corporation carried out a number of successful avalanche projectile tests during December 1985 and April 1986. As you are aware, the material currently in use throughout Canada is of American design and manufacture and leaves something to be desired.

The product presently under consideration by Ottawa, designed and developed by Dr. Sitnam and his team in Vancouver, is of by far superior quality and performance, but, it too still needs refining. The award of funds by the DSS to the E. S. Mantis organization would enable a continuation of development and resulting production.

Through the medium of your association and newsletter we would appreciate you making the membership aware of the considerable work that has already been accomplished. It would not be inappropriate to mention a figure of \$90,000 of expenses that has already been incurred by the company which doesn't include untold hours of technical expertise.

Thanking you for any encouragement you are able to provide to this all Canadian effort.

ALBERTA AVALANCHE SAFETY SYMPOSIUM

Submitted by Alberta Avalanche Safety Association

The Alberta Avalanche Safety Association is organizing a Symposium on Avalanche Safety on October 30, 31 and November 1, 1987 in Edmonton at the Edmonton Inn. A previous Symposium was held during January 1982.

The lectures will enhance the participants' knowledge in snow research, rescue procedures and cold weather injuries. During the past five years, because of ongoing research, numerous changes have taken effect. The speakers will stress this new knowledge in their lectures. Each participant will be able to attend eight "main" lectures and five "elective" topics.

Main Topics

Avalanche Accidents in the National Parks, Evaluations and Rescue Methods
 Survival Research in Avalanche Accidents
 The Mountain Snowpack
 Avalanche Phenomena
 Frostbite - Treatment of the Cold Injured Patient
 Helicopter Skiing and Avalanche Safety
 Decision-making in Avalanche Terrain
 Working Together - For Safety

Elective Topics

Snowpack Stability Evaluation
 Snowpack Analysis
 Development in Avalanche Safety Equipment
 Hypothermia at the Avalanche Accident Site
 Group Management, Search and Rescue at the Accident Site
 Avalanche Safety for Snowmobilers
 Failure of Snow Temperature Metamorphism

Senior avalanche research and control personnel in Canada will be the speakers at the main and elective lectures.

The Symposium should be of interest to all skiers, snowmobilers and climbers. It will be especially informative for individuals who have spent a considerable amount of time in the mountains pursuing recreational activities. Approximately 350 participants are expected to attend.

The exact fee has not been established as yet, but is expected to be about \$40.00 per person for three days of lectures.

Information: Alberta Avalanche Safety Association
8711 - 62 Street
Edmonton, Alberta
T6B 1N5
telephone (403) 466-6485

NATIONAL AVALANCHE SCHOOL

Submitted by Alicia Leppert
National Avalanche Foundation

Interested parties can learn the fundamentals of avalanche science, avalanche protection, winter travel techniques and other related topics during the tenth National Avalanche School to be held in Lakewood, Colorado November 1-5, 1987 and at field locations between December, 1987 and February, 1988.

The National Avalanche School is a two-phase professional training opportunity consisting of five days of classroom sessions (Phase I) and a three-day field session (Phase II). It is possible to attend the classroom sessions only, but participants in the field session must have completed the classroom work.

Phase I will include lectures, small group workshops, exhibits and discussions. The instructional staff of about 25 people will include research scientists and operational avalanche experts. The fundamentals of mountain meteorology, snowpack characteristics, field hazard evaluation, and stability evaluation are some of the other topics to be addressed.

Phase I will be held at the Lakewood Sheraton Convention Center. Registration will begin at 1:00 p.m. on Sunday, November 1. Tuition for Phase I is \$280 for members of the National Ski Patrol or the National Ski Areas Association and \$400 for all others. Attendance is limited to approximately 200 students.

Phase II field sessions will be offered at several locations and will emphasize practical applications of the fundamental principles and practices demonstrated by avalanche specialists familiar with local conditions. There will be two sessions: one for those most interested in avalanche activities at developed ski areas; and one for those interested in safe, winter backcountry travel. Tuition for Phase II is \$150.

The National Avalanche School is sponsored by the National Avalanche Foundation, a non-profit education organization administered by the National Ski Patrol. The School should be of most value to individuals with some previous avalanche training and avalanche-related field experience.

For more information, contact the National Avalanche Foundation, 133 South Van Gordon, Lakewood, CO., 80228.

CONFERENCES

Symposium on Snow and Glacier Research Relating to Human Living Conditions

4 - 9 September 1988 at Lom, Norway

The Symposium will be concerned with science and engineering aspects of the following topics:

1. Avalanches of snow, ice and mixed snow and water.
 - a) release mechanisms and flow dynamics,
 - b) control and protection measures,
 - c) forecasting, risk levels, cost-benefit analysis.
2. Drifting snow.
3. Glacier and snow hydrology.

Requests for information should be addressed to the Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, England.

PUBLICATIONS

McFarlane, Rhoda C., 1986

Trends in Avalanche Victims in Canada, 1871 to 1984. Environments, Vol. 18, No. 1-2, pp. 79-84. (published by University of Waterloo, Waterloo, Ontario).

The paper presents the number and activity of people who have been buried, injured or killed by avalanches. Prior to 1930 railway work and mining were linked to the greatest number of victims. The number of victims related to recreation increased dramatically after 1975.

International Snow Science Workshop - Proceedings. Lake Tahoe, October 22-25, 1986; 248p.

The publication contains the papers presented at the workshop. Copies have been mailed to the workshop participants and a limited number of them are available for sale.

Contact: Kit Twomey
CSL - CRSEO
University of California
Santa Barbara, CA 93106
telephone (805) 961-2650

Cost: U.S. funds \$17.50.

PERSONAL

Willi Pfisterer has decided to hang up his red socks and to retire in July 1987.

Willi has been Alpine Specialist with Parks Canada since 1968, after a career as a mountain guide and a stint as a snow observer at Rogers Pass. His principal achievement was to advance the wardens of the National Parks to a highly skilled mountain rescue force and to develop the mountain and avalanche safety in the parks. Willi has served as the Vice-president of the Canadian Avalanche Association, and has been an instructor of the avalanche courses for professionals the first course in 1971. His colleagues, climbing partners, fellow instructors and students do and will remember his dedication to a higher standard of work, rational decisions, and sense of humour, which have contributed to the success of avalanche work in Canada. We all wish him success with his future activities which will include gold mining and ranching.

Peter Schaerer

AVALANCHE TERRAIN VIDEO

The Canadian Avalanche Association has produced an instructional video tape on avalanche terrain.

The program consists of a series of colour slides with sound track. It summarizes the characteristics of terrain that favor the formation of avalanches. Guidelines for selecting safe routes in the backcountry and safe spots on roads are given. The tape is suitable for presentation in avalanche courses for the general public and professionals, either as an introduction to a lesson on avalanche terrain or as a summary following a discussion of terrain and route finding.

The running time is 10 minutes.

Copies of the terrain tape are available and may be purchased for a price of \$50.00 including postage. Presently the tape cassettes are made in VHS, but Beta and 3/4 inch could be produced on request. Orders and payments should be addressed to the Canadian Avalanche Association, 3650 Westbrook Mall, Vancouver, B.C., V6S 2L2. telephone (604) 666-6714.

The Canadian Avalanche Association intends to produce similar educational material in the future and has appointed a committee for this purpose. The committee has identified snowprofile observation, weather observations, mountain weather, and avalanche search and rescue as topics for future tapes. It invites suggestions for other topics. Suggestions concerning programs and productions should be directed to the chairman of the committee,

Rod Pendlebury, P. O. Box 364, Fernie, B.C., V0B 1M0
Telephone (604) 423-7932