AVALANCHE NEWS NO. 5

January 1981

## 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 6 is planned for publication in June 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.

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Canadian Avalanche Committee, 3904 West 4th Ave., Vancouver, B.C., V6R 1P5
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## ACCIDENT REPORTS

Canadian avalanche safety staff, national and provincial parks personnel, mountain guides, ski guides, ski patrollers, maintenance personnel concerned with highways, powerlines, microwave stations and mines, and backcountry skiers are reminded to report all incidents when people are either trapped, caught, partially buried or buried in avalanches and/or when property is damaged by avalanches. Reporting cards are available from Geoff Freer, Ministry of Transportation and Highways, 940 Blanshard Street, Victoria, B. C., V8W 3E6, telephone: 604-387-1738.

The reports should be mailed to the Avalanche Centre of the National Research Council, 3904 West 4th Avenue, Vancouver, B. C., V6R 1P5. The information will be treated as confidential. Statistics in summary form only will be published in the next issue of Avalanche News, June 1981.

Mail the reports immediately to ensure inclusion in the summary of this winter's data.

## AVALANCHE SUB-COMMITTEE OF THE INTERNATIONAL COMMITTEE ON ALPINE RESCUE (IKAR)

The Sub-committee held its meeting on 25 October 1980 during the annual conference of IKAR at Berchtesgaden, Germany. The Chairman, Guy de Marliave, welcomed the representatives of the 14 member nations.

### Avalanche Accidents

Statistics on deaths in avalanches during 1979-1980 were tabled.

| | Climbers | | In | Outside | | | | |
|---|---|---|---|---|---|---|---|---|
| Country | With Ski | Without Ski | Ski Areas | Ski Areas | At Work | On Roads | In Bldgs. | Total Death |
| Canada | 1 | - | - | - | - | - | - | 1 |
| Czechoslovakia | 1 | 3 | - | - | - | - | - | 4 |
| Spain | 1 | 4 | - | - | - | - | - | 5 |
| Bulgaria | - | 2 | - | - | - | - | - | 2 |
| Germany | 2 | - | - | - | - | - | - | 2 |
| France | 16 | 3 | - | 12 | - | 1 | - | 32 |
| Italy | 4 | - | 1 | 8 | 1 | 3 | 5 | 22 |
| Yugoslavia | - | - | - | - | - | 3 | - | 3 |
| Lichtenstein | - | - | - | - | - | - | - | - |
| Norway | 7 | - | - | - | - | - | - | 7 |
| Poland | - | 2 | - | 3 | - | - | - | 5 |
| Austria | 4 | 3 | - | 5 | - | 3 | 1 | 16 |
| Switzerland | 3 | 4 | 2 | 17 | 1 | - | - | 27 |
| United States | 3 | - | - | 3 | - | - | - | 6 |
| Total | 42 | 19 | 3 | 48 | 2 | 10 | 6 | 132 |

The statistics show that the highest percentage of deaths occur outside controlled ski areas. This is of great concern and the following resolution was made:

- That avalanche awareness should be taught in all ski courses. This should include recognition of avalanche terrain, hazard evaluation, safety measures for travel in avalanche terrain, and rescue procedures. The use of electronic detection devices should be recommended and instruction in their use should be carried out. Shovels should be carried. Ski instructors should take avalanche safety courses and teach avalanche safety in the future. The teaching of downhill skiing skills alone is not sufficient.

As UNESCO is no longer collecting or publishing information concerning avalanche accidents involving skiers and mountaineers, IKAR will now collect such data from all member countries.

Avalanche Statistics concerning accidents in the Himalayas were presented by the delegation from Norway. This information was compiled by a Reuter correspondent living in Nepal and by Dave McClung, National Research Council of Canada. These statistics covered different areas of accident involvement. The concern, however, is that both sets of information agree that the percentage of avalanche deaths in Himalayan mountaineering and trekking is extremely high. Over a period of 28 years in Nepal alone, 96 avalanche deaths occurred; of the 96 people killed, 48 were Sherpas. It was pointed out that in a country where insurance and social benefits are non-existent, the death of a Sherpa means catastrophe for his family, both financially and socially. Recent Sherpa and porter problems are partially attributable to this problem. It is felt to be the responsibility of all expeditions using porters to protect against such occurrences.

Rescue Equipment

The Hohenester rescue balloon has proven to be a success during tests. The current problem is the inflation method which requires further development. The fact that the balloon avoids burial is significant.

Gerald Kampel demonstrated the ORTOVOX transceiver which transmits and receives simultaneously without switching, on both frequencies, 2275kHz (as used in Skadi, Pieps, Echo) and 457kHz (as used in Barryvox VS68, Redar).

The special features mentioned are:

a) A battery check light is included.
b) The on and off switch is activated by placing a strap around the neck and plugging a key into the unit (it forces one to wear it properly).
c) The switch from transmit to receive is activated by pulling out the earphone.
d) The volume control contains a rough distance indicator.
e) Price $130 (in Europe).
f) Delivery in 1981.

The company that produces the REDAR transceiver has also developed an additional model which transmits and receives on both search frequencies.

Courses

Two types of avalanche courses are being conducted presently under IKAR supervision:

1. Avalanche Science; Davos Weissfluhjoch
2. Avalanche Rescue; France

The courses are conducted alternately every second year. Further IKAR courses are being discontinued and member countries are advised to hold local courses which are felt to be both more efficient and more economical.

Publications

IKAR has developed a glossary of standard avalanche terms. This glossary consists of 450 words and is currently being proof read, and published in English, French, German, Italian, Spanish and Slovak.

A handbook on avalanches has been published by Andre Roch. It is an interesting and beautiful publication covering all aspects of the subject, but presently is available only in the Italian language.

Czechoslovakia has produced a film on avalanche safety as well as a new handbook.

At the general meeting of IKAR the following additional items of interest were discussed.

a) The International distress signal was discussed...no change.
b) Britain was presented by a Mr. Walters and accepted as an associate member. All areas of Great Britain, excluding Scotland, are represented.
c) Andre Roch was elected as a special single member.
d) The U. S. A. application of NASAR was received favourably. The U. S. A. is now a member of IKAR. All related subjects should be dealt with through NASAR.
e) Canadian Ski Patrol membership request could not be considered as Parks Canada is the Canadian IKAR representative. A closer working relationship between the Canadian Ski Patrol and Parks Canada is recommended.
f) The total mountain accident figures for the 14 IKAR nations in 1979-1980 were:
   28,350 - Rescues
   25,601 - Persons rescued
   20,864 - Injured
      979 - Deaths

## AVALANCHE WORKSHOP 1980

On 3-5 November, 1980 a State-of-the-Art Workshop was held at Vancouver, British Columbia. The workshop was organized by the Canadian Avalanche Committee with Peter Schaerer acting as general chairman. Geoff Freer with his staff of the British Columbia Ministry of Transportation and Highways was responsible for the administration including mailing of brochures, registrations, arrangements for meeting rooms and refreshments.

A total of 250 persons had registered for the Workshop. The large number of attendees made it difficult to meet the objectives of the workshop: to review recent experience and to define needs for development through a mutual exchange of ideas. The format of the meeting turned out to be more like that of a conference with speakers delivering prepared papers and limited input from the audience. The discussion period was lively and heated following some presentations but was not used for others.

The topics treated at the Workshop were:

Public Warning Programs, three contributions
Training and public education, six contributions
Avalanche hazard forecasting, four contributions
Weather forecasts in avalanche work, four contributions
Snow cover observations, five contributions
Standards of observations, one contribution
Avalanche size classification, one contribution
Search and rescue, four contributions

The highlight of the Workshop was a presentation by Andre Roch from Switzerland covering his 40 years of experience in the study of the start of avalanches and avalanche accidents.

The papers and discussions are being edited now and will be published as a Technical Memorandum of the Associate Committee on Geotechnical Research of the National Research Council.

The publication is not expected to be available before late summer 1981.

The Workshop participants will receive a copy of the publication free of charge. Additional copies may be purchased later. Those who wish to be notified when the proceedings of the Workshop are available are requested to send their name and address to the Canadian Avalanche Committee.

## AVALANCHE COURSES

The American Avalanche Institute organizes a series of avalanche training courses in various parts of the U.S.A. Of special interest to people who live in Western Canada and have basic training in avalanche safety is the Advanced Forecasting Seminar at Crystal Mountain, Washington, March 9-11, 1981.

The topics of the seminar include techniques of snow profile observation, analyzing snow profile data and snow features and avalanche forecasting strategies. The course fee, not including meals and lodging is U. S. $160.00.

Registrations and information:

American Avalanche Institute
Box 308
WILSON, Wy 83014

Telephone: 307-733-3315

## EQUIPMENT

### Snow Observation Kit

The equipment commonly used for observation of snow profiles is available from SEAR Search and Rescue Equipment, 2818 Bayview Street, Surrey, B. C., V4A 2Z4.

The complete kit contains:

ruler, 2 m long
crystal screen
8X magnifying glass
two glass thermometers with shield
knife
paint brush
500 $cm^3$ density sampler with balance
hard cover surveyors field book

Kit price: $130.00
The items are also sold individually.

Sear also manufactures and sells sectional probes:

a) six sections @ 24 inch $42.00
b) seven sections @ 500 mm $50.00

### Snow Crystal Card

A laminated plastic card with a clear millimetres grid for snow crystal observation can be purchased from SNOW KNOWLEDGE, P. O. Box 566, Park City, Utah, 84060. The card contains prints of the symbols for classification of crystal shapes and snow hardness and comes in a felt pocket. Price: U. S. $6.00.

## INTERNATIONAL MOUNTAIN SOCIETY

The International Mountain Society was formally incorporated as a non-profit organization in the State of Colorado on 3rd September, 1980, and will begin its first full year of activity on 1st January, 1981. Its aim is to help achieve a better balance between mountain environment, human welfare, and the development of natural resources. This great task will be handled through encouragement of basic and applied interdisciplinary research throughout the mountain world, through the dissemination of knowledge and its application to the solution of mountain land-use problems, and through the development of a mountain ethic amongst all sectors of society who use and appreciate mountain lands. The broad objectives will be pursued by:

--publication of a new quarterly scientific journal: Mountain Research and Development;

--periodically holding meetings and workshops to focus on specific mountain issues;

--use of the Society as a vehicle for association and exchange of ideas and experience;

--making the Society's expertise and access to information available to international, national and regional governments and agencies, industry, conservationist institutions, and other organizations;

--contributing to the training and education of the world community at large.

The term "mountains" is used in a broad sense to include uplands and areas with steep slopes at lower elevations. Thus in many areas of the developing world our concern will often lie as much with the problems facing upland people as with the physical habitat in which they live.

The Society has evolved from the work of the International Geographical Union's commission on Mountain Geoecology, and its assocation with the United Nations University Programme on Natural Resources, and the UNESCO Man and the Biosphere (MAB) Programme.

The first issue of the journal will be released in May, 1981. It will be co-published by United Nations University and the International Mountain Society, with additional financial support from UNESCO. It will develop an editorial policy to embrace a wide range of disciplines in the natural and human sciences, medicine, engineering and architecture.

Membership in the Society is open to all individuals for an annual subscription of $30; $18 for bona fide students; and $45 for institutions and libraries. The subscription will include the price of the journal which will consist of approximately 480 pages of high quality printed

material per year. Subscriptions and queries should be addressed to:

International Mountain Society
P. O. Box 3148
BOULDER, Colorado 80307
U.S.A.

Misha Plam
Treasurer, International Mountain Society

To Users of Life Link Shovels:

A molding problem has been observed with some Life Link shovels. Should you break a shovel please notify Life Link by writing and stating:

Date purchased
Type and colour of shovel (i.e. detachable handle)

The shovel will be replaced.

Snow Research Associates
Box 345
WILSON, Wyoming 83014
U.S.A.

## AVALANCHE PROGRAMS IN WESTERN CANADA

Issue 4 of Avalanche News described the activities of the avalanche study group of the National Research Council. The following is a brief outline of the organization and activities of the Snow Avalanche Section, Maintenance Services Branch, British Columbia Ministry of Transportation and Highways.

### Snow Avalanche Section, B.C. Ministry of Transportation and Highways

The Snow Avalanche Section of the British Columbia Ministry of Transportation and Highways was formed in 1975 as a result of a six month study recommending improved avalanche management programs for the Ministry. The Snow Avalanche Section is headquartered in Victoria with field offices located in areas of higher avalanche hazard.

Geoff Freer and five other personnel work out of the Victoria office. District Avalanche Technicians are located at Creston, Hope, Lillooet, and Terrace.

The Snow Avalanche Section activities concentrate in the following areas:

1. Highway Avalanche Program

The Ministry of Transportation and Highways has 37 areas where snow avalanches affect highways. Personnel at each of these areas are provided with equipment and training for the various aspects of avalanche safety including snow, weather and avalanche observations, safety measures and search and rescue. Avalanche control in many areas consists primarily of highway closures during high hazard periods. Some District Avalanche Technician areas use explosive control by Avalauncher and helicopter bombing.

Snow avalanche atlases are being developed for most areas to describe the avalanche terrain in each area.

Seventy-five weather stations have been established and regularly contribute to the Mountain Weather Forecast reporting network. Climate data from this network is maintained for future research.

2. Avalanche Hazard Zoning

Existing and proposed residential developments located in mountain areas are studied to evaluate adjacent avalanche hazards. These studies are often in conjunction with the Ministries of Municipal Affairs and Lands, Parks and Housing.

3. Avalanche Hazard to Aerial Tramways

Studies to evaluate hazard to ski lifts and other aerial tramways are conducted in conjunction with the Chief Inspecting Engineer of the Ministry of Transportation.

4. Ski Areas and Wilderness Skiing

Evaluation of avalanche safety in existing and proposed operations is done in conjunction with the British Columbia Ski Co-ordinator, Ministry of Lands, Parks and Housing.

## SNOW STABILITY IN JANUARY 1981

Avalanche control and safety personnel in Western Canada reported the following condition of the snow pack and avalanche activity in the first part of the winter 1980-1981.

In December 1980 the precipitation was very high with some locations reporting a double amount of average monthly precipitation. Heavy snowfalls occurred during the first two weeks of December, but unusually high temperatures in the latter part of the month turned the precipitation into rain in all the mountains of British Columbia and Alberta. Extremely heavy rain fell on December 26th.

On the Pacific Coast and Vancouver Island, the warm weather wasted most of the snow that was deposited in early December, leaving bare ground in lower avalanche starting zones. Ski areas on Vancouver Island and in the Lower Mainland had to close due to lack of snow. In the Interior of British Columbia and in the Rocky Mountains the snow pack remained above average at the end of December.

In addition to the high air temperatures which were responsible for a partial disappearance of the snow, very strong winds on December 10th and 11th blew away the snow on many exposed slopes. Very little precipitation fell during the period January 1st to 20th, and consequently by mid-January the snowpacks were average to below average in the Columbia and Rocky Mountains.

The heavy precipitation, combined with high temperatures, produced numerous avalanches on 10/11, 15/16 and 24/26 December. Although most of them were small, a few avalanches greater than size 3 were observed in the Monashee and Selkirk Mountains. No significant avalanches were noticed in January.

The rain in December and the exceptionally high temperatures which were maintained throughout the month of January produced dense, strong snow in all areas. Older snow observers could not remember having seen such a dense and stable snowpack in January in the past twenty years. All observers reported snow packs containing rounded crystals from melt-freeze and equitemperature metamorphism and numerous crusts and ice layers. In Southern British Columbia specific gravities between 0.35 and 0.4 were observed in snow packs only 1 inch deep. As a result of the stable snow pack all back country travel was safe on January 20th and will remain safe until a snowfall occurs.

In the Columbia and Rocky Mountains the snow close to the surface went through a temperature-gradient metamorphism as a result of radiation cooling. This produced weak layers in the upper 20 cm of the snowpack, some of them between crusts. Surface hoar has formed at elevations below 2000 m where moist air is present and cold air is trapped in valleys. At the Coast Mountains the temperatures appeared to be too high to allow the formation of temperature - gradient snow and surface hoar.

The weak layers forming near the snow surface in January will produce an instable base for later snowfalls at all exposures and elevations. Instable snow may be expected after moderate snowfalls and could be maintained over longer periods in February and March. Assuming a normal development of the winter, however, no avalanches of catastrophic size are expected. In evaluating snow stabilities and avalanche hazard it will be important to monitor the development and strength of the snow layers presently found near the surface.

Accidents were reported only from Banff National Park, where in two instances skiers were partially buried and injured.

Peter Schaerer