

## I.S.S.W., PAST, PRESENT, AND FUTURE

John Montagne  
17 Hodgman Canyon  
Bozeman, Montana 59715

and  
Peter Schaerer  
Apt. 103-105 West Kings Road  
North Vancouver, B.C.  
Canada V7N 2L7

### **INTRODUCTION:**

The purpose of this paper is to provide a background for the current series of biennial snow science meetings in North America. Such a background may be useful in guiding the future course of such meetings to assure that they continue to serve the special requirements of pure and applied science together with the practical needs of those who carry through the front line duties of snow research and avalanche safety and control. The "workshop" format has proven to be an excellent catalyst to the important communication among all who attend these meetings because it pointedly reserves time for exchange of ideas during the course of the meetings. Interest in the general aspects of snow has been ushered in on the coattails of the avalanche movement. Because of this dominance of avalanche-related problems and activities, the current paper is admittedly biased toward avalanche phenomena, which is not to deny the importance of the considering the whole aspect of snow in general for these meetings.

Avalanche hazard forecasters and safety planners are highly specialized and often work in the limited territory of a ski area or a road and have little contact with colleagues. They need to meet fellow professionals from time to time for an exchange of experiences and for learning about new developments. Personal contacts are even more important because avalanche hazard forecasting and control relies much on experience, and only a limited amount of the knowledge can be picked up from books. The "loneliness" and need for meetings probably was stronger in earlier years when avalanche control was carried out only in a few widely separated locations in North America and communication was more difficult.

### **THE BEGINNINGS:**

In the 1950's, avalanche education, exchange of experience, and review of new techniques was carried out through the Alta avalanche schools of the U.S. Forest Service. By the end of the decade, however, when avalanche control problems had spread to other agencies, it was found necessary to involve a variety of users and contributors in the pursuit of new approaches and ideas on avalanche safety and control. In fact, the scientific and practical consideration of the broader scope of snow science in

general was also beginning to stir at this time as water supply, highway safety, and other activities contingent upon snowfall arose as issues.

The first few meetings of representatives of various agencies had the objective of exchanging experience and new knowledge among avalanche experts in the U.S.A. and Canada, and included a few visitors from other countries who happened to be present at the time. The meetings were rather informal and allowed for much discussion. Later, with a growth of the avalanche industry, the number of participants and formal presentations at workshops increased, often paradoxically diluting the learning process in the informal discussions. Experience from early workshops suggested that the most beneficial meeting format would involve a maximum of about 120 participants and 12 papers per day. A greater number seemed to confuse and crowd the discussions and critiques even though the latter were often as important as the presentations themselves.

#### **MEETINGS IN THE 1960'S:**

The first meeting that brought together a variety of government agencies, industries, and users dedicated both to snow and avalanche science was held in April, 1960 at Santa Fe, New Mexico in conjunction with the 28th Annual Meeting of the Western Snow Conference. At this meeting Mario "Pete" Martinelli of the U.S. Forest Service Experiment Station at Fort Collins, Colorado, gave a paper on his study of avalanche control in Western Europe, and Peter Schaerer, of the National Research Council of Canada, described the avalanche control program at Rogers Pass, Canada, which was being developed at that time. On two days following the conference, about 30 representatives of a variety of agencies of the U.S. Government, ski areas, universities, and consultants met for discussions of avalanche control methods. For example, the participants included two U.S. Air Force pilots who reported on their recent mission of releasing avalanches in Glacier National Park by over-flying jet airplanes at supersonic speed. Their avalanche control was successful, but the participants at the meeting found the method impractical for operational use.

Montgomery Atwater, the pioneer of avalanche research and control in North America, was the principal speaker and discussion leader, and pleaded for a stronger commitment of the government to avalanche studies and control. The meeting ended with the drafting of recommendations to the U.S. Government which later resulted in the formation of the U.S. Forest Service Avalanche Study Group at Fort Collins that superseded an effective but less formal earlier Group at Alta, Utah.

#### Workshop at Calgary 1969

The Snow and Ice Subcommittee of the Associate Committee on Geotechnical Research of the National Research Council of Canada, with its mandate to hold conferences from time to time on

specific topics, organized a workshop on the failure of ice covers and ice pressures at Calgary in 1969. Because of an increase in winter sports and development in the mountains of Western Canada at that time, the organizers added a meeting on avalanches. About 60 of the 188 conference participants turned up, and 12 papers were presented at the avalanche session on 24 October. In the morning, with Geoff Hattersley-Smith as Chairman, avalanche problems at highways, mines, and recreation areas were described. Brad Geisler, of the Canadian Ski Patrol System, gave an impressive projection of avalanche hazards in snow mobiling and helicopter skiing before any accidents with these types of recreation had occurred; his predictions became true ten years later. In his talk, Geisler recommended the formation of an avalanche centre which would be available for consulting, organizing training programs, setting standards, and issuing weekly hazard evaluations. Unfortunately, his recommendations were made at a time when the Government of Canada had just imposed one of its periodic limitations on budget and staff growth and it took another 22 years before a Canadian avalanche center was formed. In the afternoon of 24 October, with Peter Schaerer as Chairman, avalanche forecasting methods were discussed by notable researchers including Edward LaChapelle, Ron Perla, Richard Sommerfeld, Arthur Judson, and Fred Schleiss.

A further accomplishment of the above meeting was the recommendation by forecasters and researchers that this conference with its informal discussions was beneficial to all concerned with snow and that similar meetings should be held in the future.

#### **"Pure Science" Meetings on Snow and Avalanches, 1966 -1981:**

Parentetical to the subject title of this presentation, several important meetings on snow and ice were held in Europe and Japan, and at least two in the U.S. during this period, notably, the Physics of Snow and Ice, organized by the Japanese at Sapporo, (Oura, 1967), the Symposium on Scientific Aspects of Snow and Ice Avalanches at Davos, Switzerland in 1965 (Tison, 1966), the International Symposium on Snow Mechanics, Grindelwald, Switzerland in 1974 (IAHS-AISH, 1975), the Symposium on Snow in Motion at Ft. Collins, Colorado in 1980 (Glen, et al, 1980), and the Workshop on the Properties of Snow, at Snowbird, Utah (Brown et al, 1981). These meetings were more singularly rooted in pure science than the "workshop type" meetings that included practitioners mentioned above, but certainly they served an important function in the exchange of ideas.

#### **MEETINGS OF THE 1970'S:**

##### Snow Seminar at Seattle 1971

Edward LaChapelle organized a workshop at the University of Washington, Seattle, on 13-14 May, 1971. It was attended by 91 participants including a visitor from Austria and one from

France. The organization and presentations were very informal. LaChapelle had drafted a stimulating program that contained a mix of 10 to 15 minute reports on current research projects and equipment developments including forecasting techniques, safety programs, zoning, public education, and training of snow observers. The degree of informality and limited number of participants contributed to an outstanding exchange of ideas. In the following years, the number of avalanche and snow-related workers, workshop attendance, and number of presentations grew rapidly and as a consequence, the workshops became more formal.

#### Snow Symposium at Reno 1972

Contributing to the second National Avalanche School at Reno, Nevada, on 16-17 November the U.S. Forest Service hosted a symposium on snow organized by Ronald Perla. By concentrating on scientific aspects, for example, snow slab mechanics, ultrasonic emissions in snow, and avalanche impact pressures, the symposium provided a balance to the practical subjects that were considered at the avalanche school during the previous days (Perla, 1973). About 200 participants, mainly from the avalanche school, attended.

#### Atwater Meeting of 1973

On the occasion of the 70th birthday of avalanche pioneer, Montgomery Atwater, the National Ski Patrol, through W.R. Hotchkiss, organized a meeting at Yosemite National Park, California in October, 1973. Though the principal objective was to honor Atwater for his contributions to avalanche hazard forecasting and control, serious talks about snow in general and avalanche control in particular were presented and discussed in a "workshop atmosphere".

#### Workshop at Banff 1976.

In September, 1975, the need to coordinate avalanche work in Canada led to the formation of an avalanche committee consisting of Peter Schaerer (NRC Canada), Ronald Perla (Environment Canada), Geoff Freer (B.C. Ministry of Transportation and Highways), and Dave Pick ( Parks Canada). At its first meeting the committee recognized the need for another avalanche workshop and initiated its organization. This meeting was held at Banff, Alberta on 1-3 November. Perla's plan presented three themes; avalanche control, avalanche forecasting, and avalanche safety. A total of 35 presentations were given, some outlining safety and warning programs at ski areas, and several dealt with applications of explosives, and search and rescue. Lively discussions followed the individual talks. The three days in the meeting room were supplemented by a notable field trip to Rogers Pass. 129 registrants attended the workshop, including speakers from Japan, Norway, and Italy.

## MEETINGS OF THE 1980'S:

### Workshop at Vancouver 1980

In 1980, the Canadian Avalanche Committee again recognized the need and organized a workshop, this time on the Pacific Coast. The meeting, sponsored by the Associate Committee of Geotechnical Research of the National Research Council and the B.C. Ministry of Transportation and Highways, was held at Robson Square in Vancouver on 3-5 November. A field trip to Whistler Mountain on 6 November followed the formal meetings. A total of 250 participants were registered including three visitors from Austria, Switzerland, and New Zealand.

The organizers selected a limited number of practical as well as scientific themes from the many aspects of snow, avalanches, and avalanche protection, and decided that the need for information and idea exchange was greatest in the fields of public education and avalanche hazard forecasting. Avalanche control, for example, was excluded from the presentations. Avalanche hazard forecasting was deliberated under the headings of data collections, weather information, snow packs, and hazard evaluation techniques. Invited speakers introduced each topic by summarizing the state of the art. In addition, Swiss avalanche engineer Andre' Roch gave the keynote address on the starting mechanisms of avalanches. Introductory sessions were followed by paper presentations and spontaneous discussions from the floor. Important material on "back-country" group behavior and decision-making added a new facet to the scope of these meetings. Unfortunately, the number of participants was too great for everyone to be heard during the lively discussions.

One of the benefits of a workshop and conference is to provide opportunity for special snow interest groups to meet. On the evening of November 4th, the avalanche safety operators in Canada took advantage of this opportunity to initiate the formation of the Canadian Avalanche Association, and this group was incorporated a year later and continues in force today.

### Workshop at Bozeman 1982

This October meeting, sponsored by the snow study group at Montana State University, brought formal recognition to the breadth of the meeting format by creating the title, "International Snow Science Workshop". A pointed effort was made by special invitation and other means to bring together snow scientists and practical workers to advance snow safety and technology. To this end, a motto "The Merging of Theory with Practice", became the byword and spirit of the meeting, and continues to this day. Snow practitioners were urged to present scientific and practical reports; half hour discussion times were allowed for each presentation. With careful orientation on conventional scientific method, prior reviews, and scientific

writing convention, practical as well as scientific aspects appeared side by side in the resulting literature.

Among the special subjects approached at this meeting were avalanche rescue dogs, state of the law concerning avalanche zoning, grooming cross-country ski courses, bomb trams, and post control release. An all-day field trip to Bridger Bowl Ski Area highlighted the practical aspects of snow control and rescue methods. 220 people attended this meeting, including 10 foreign participants. The banquet address was given by Edward LaChapelle.

#### Workshop at Aspen, 1984

335 people attended this meeting at Aspen, Colorado. Greg Mace and Pete Martinelli and staff at the U.S. Forest Experiment Station at Ft. Collins shared the leadership responsibilities. The spirit represented at the previous Bozeman meeting was carried on and embellished. Highlights were papers on seasonal snow classification under Sam Colbeck, use of statistics in avalanche dynamics, a demonstration of the use of simple instruments to reach important scientific conclusions on snow behavior, and the French avalanche education program under Francois Valla. Andre' Roch returned to the United States to address the banquet and help celebrate the anniversary of the establishment of the Aspen Ski Area.

#### Workshop at Squaw Valley 1986

Under the direction of Larry Heywood and Danny Marks, this meeting attracted 250 participants to Squaw Valley, California. A number of important quantified snow theories were presented as well as a thorough review of the important legal implications and control policies involved with recent disastrous avalanche incidents. The meeting also provided a forum resulting in the founding of the American Association of Avalanche Professionals.

#### Workshop at Whistler, B.C., 1988

At this meeting 310 participants attended the sessions in which 33 papers were presented in three days, with ample discussions following each paper. Chris Stethem was the Chairman of this meeting, jointly sponsored by the Whistler Resort and Canadian Avalanche Association. The poster and commercial exhibits were outstanding. U.S., Canada, Japan, France, and Switzerland were all represented. A precedent was set to accommodate the meetings of the Canadian Avalanche Association and the American Association of Avalanche Professionals as part of the I.S.S.W. agenda.

#### MEETINGS OF THE 1990'S:

##### Workshop at Big Fork, Montana, 1990

Big Fork proved the feasibility for conducting I.S.S.W. in

the well appointed facilities and pleasant ambiance of a small town. It was a meeting that provided great fellowship among the avalanche clan. One critical ingredient was the spacious auditorium. 375 attended this well run meeting under the sponsorship of the U.S. Forest Service, with Stan Bones as Chairman. Instead of an evening banquet, a novel afternoon barbecue in a rustic camp setting was a welcome change. Hans Frutiger was feted as a distinguished foreign guest, Pete Martinelli was honored for his past service to the cause of avalanches. The keynote address stressed the role that "mountains" played in the philosophy, life style, and spirit of people who worked with snow. Some awards were given on this occasion, although this has not become a precedent, possibly because The American Association of Avalanche Professionals customarily makes such awards annually. An instructive trip to the Goat Lick Spring Avalanche along the South Fork of the Flathead River in Glacier National Park capped off this high spirited meeting.

#### Workshop at Breckenridge, Colorado 1992

This meeting was held under the sponsorship of the Colorado Avalanche Forecast Center, Knox Williams, Chairman, in the large convention halls of Beaver Run Resort. 350 people representing 10 countries attended, and 36 papers were presented. Ed LaChapelle addressed the banquet with a review of several axioms on snow control. Notable presentations included descriptions of the new French "Gaz-Ex" avalanche triggering machine, the increasing use of the "Rutschblock" and its derivatives for testing snow strength, new multi-frequency safety beacons, and sophistication in computerized analysis of snow and avalanche phenomena. Practical and scientific presentations were about evenly represented. I.S.S.W. had become truly international, a fact that is of considerable importance to those of North America who may not have the opportunity to exchange information abroad. The meeting more or less proved that a relatively frugal organization can hold its meetings at a relatively well-to-do resort and remain within reasonable financial bounds.

#### **FUTURE MEETINGS OF I.S.S.W.:**

As of this writing, commitments are in hand for meetings at Snowbird, Utah, 1994 (Liam Fitzgerald, Chairman), Lake Louise-Canmore, Alberta, 1996 (Tony Daffern, Chairman), and possibly the Tahoe area, California, 1998 (Dick Penniman, Peggy Ricketts, Proposers).

#### **GUIDANCE OF I.S.S.W'S**

At the Aspen meeting of 1984, the need to establish a system and guidance for future I.S.S.W. meetings was recognized. A Steering Committee was appointed to serve indefinite terms with the outgoing I.S.S.W. meeting chairperson designated to assume the chairmanship of each future Steering Committee. Two

representatives were appointed from each of four western U.S. and two Canadian geographic areas, and one representative from Europe. A clockwise biennial progression was proposed for future meetings through the western mountain states and Canada. Every third meeting is to be in Canada. The propriety of having a specific country, or organization act as a responsible agent for I.S.S.W. was debated, and it was concluded that the current non-aligned nature of the organization would be the best way to carry it on. The responsibilities for such meetings would be shared by the U.S. and Canada. Rich Marriott recommended that a four year lead time announcement precede each future meeting.

The I.S.S.W. Steering Committee after the Whistler Meeting of 1988, under Chris Stethem, recommended that housing accommodations for these workshops should not be predicated on patronizing any particular resort, - that housing should be open to the free choice of the participants. This has helped keep the housing costs down for those with limited resources. In addition, the Steering Committee assumed the duty of guiding the selection of the next meeting site, assuring its sponsorship, and approving or seeking the appointment of a chairperson. Considerable correspondence was carried on with in-coming meeting Chairman, Stan Bones, on the number of days necessary or desirable for conducting the I.S.S.W. meetings in view of the increasing numbers of papers, poster sessions, professional meetings, field trips, and fellowship desires.

#### **CONCLUSIONS:**

Several ideas emerge from the material collected above. I.S.S.W. has inherited an effective "workshop format", largely developed out of the earlier meetings of the snow avalanche community of North America. The critical aspect of such a format is the provision for free discussion of each presentation during each meeting session and following free time. Future organizing committees should use initiative to embellish the already established routines with innovative ideas for presentation and advancement of practical and scientific material. The opportunity for those with practical snow interests to present their problems and triumphs alongside those with strong scientific interests is certainly a unique and valuable attribute that should be nurtured for I.S.S.W. and carried on in the future. Cooperation and comradery between the various factions of science, academia, and the practical field workers and ski patrol people will be promoted best if the personal aspects that tend to separate them are held in check.

If the true workshop discussion exchange is best handled with a group or meeting attendance not exceeding about 120 participants, some innovative compromise may have to be created to integrate the present large meeting format into sections or other meeting format.

Although the subject of **avalanches** is an important and

desirable focal point of I.S.S.W., the organization was essentially dedicated to the **broader aspects of snow in general**, -a critical material in every day life on the Planet.

At the risk of seeming too "academic", we have mused over the possibility of identifying snow science as a category of one of the physical sciences, such as Geology, Geophysics, or Engineering Mechanics. Certainly, elements of all three are tied up with snow, and perhaps any one of these sciences would accept snow as within the scope of its nominal activities. The situation is complicated if the unique aspects of safety, grooming, and other practical and connected activities are to have equal importance under the heading of snow science.

Still another question is whether to seek standard national bibliographic reference status for the Proceedings Volumes of I.S.S.W. which stand in many instances as the only written summary of work by snow scientists and practitioners on the continent. Currently, the Proceedings Volumes are sent only to the meeting registrants, so these state-of-the-art papers may never become known in the broader sense. We have initiated but not concluded an inquiry whether a national bibliographic agency would, in fact, carry the Proceedings as a legitimate reference series. Considering these problems, if they really are problems, someone may wish to lead us to further conclusions at this point. Perhaps "if it aint broke it doesn't need fixin".

Even though I.S.S.W. is a volunteer organization and certainly not richly endowed, it has paid its way and become an effective catalyst for learning and fellowship and a special home for those interested in snow and mountains in general. Its volunteer, non-commercial aspect nourishes independent thought and expression. If there ever was a unique organization, I.S.S.W. is it, and we can afford to be proud of this aspect.

The writers propose that this historical narrative will stimulate future I.S.S.W. organizing committees to carry on some valuable traditions but also develop new and useful aspects for future meetings.

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