

Avalanche

REVIEW

On the web at www.avalanche.org/~aaap

VOLUME 19, NUMBER 2

DECEMBER 2000 US \$4.95

The Family Dog as Avalanche First Responder

by Dan Bender



Anil, Dave Bender and Diana Bristol after another burial exercise. Diana is still partly buried in the shallow snow cave. We vary our depths up to 7 feet but DO NOT recommend that depth for people teaching their own dogs. This photo shows a shallow cave is just as effective, if the snowpack is stable enough to avoid collapsing the cave on the assistant when the dog or skier passes over it.

In This Issue

New Leadership for AAA	2
By Jeff Brown	
Awards	3
For Don Bachman, Bob Brown, Sam Colbeck, Steve Conger	
Tim Lane:	4
"Professor de Avalanchia" by Jerry Roberts	
Section Reports	6
What's New?	6
ISSW 2000	7
By Steve Conger	
Event Schedule	7
AAA Instructor Certification	7
program update by Evelyn Lees and Rod Newcomb	
ISSW Banquet	8
Dr. John Montagne Honored Avalanche of the Month	9
Metamorphosis	10

Can Your Family Dog Become an Avalanche First Responder?

As a K-9 handler for a Sheriff's Office in the Rocky Mountains, I regularly take calls from citizens who want to turn their family dog into a Search & Rescue K-9. When I describe the hundreds of hours of training for the handler and then the hundreds more hours involved in training a dog to have very specific drives and traits, they quickly realize that there is more to a SAR K-9 team than a dog that likes to fetch.

At the same time, emergency organizations like the sheriff's department encourage volunteerism. The first section in one first aid instructional book asks in bold print, "If not YOU... Who?" Every year, millions of people respond to such encouragement by attending First Aid or CPR courses. Their role in an emergency is to provide very basic care for a victim until trained EMS professionals can arrive on the scene and take over. These people are often referred to as "First Responders".

I've wondered if there's a way to apply the First Responder concept to the dogs and people that I've encountered while helping with a local avalanche school. The students at this school and

others like it have a concern about avalanche risks and at least some backcountry experience. Many of their dogs like to chase and retrieve toys. Many of their dogs are also successfully accompanying their owners into avalanche terrain, so they must have a strong drive, be in reasonably good shape, and be suitably built to handle the terrain. Is there some rudimentary training for these dogs and their owners that could improve their chances to save a life in a post-avalanche search? Could some of those dogs become Avalanche First Responder Dogs? If so, how can a dog owner safely teach a dog to find someone under snow in a real avalanche? The answer might be 'The Avalanche Dog Game'.

The Avalanche Dog Game
Almost everyone understands the principles of computer games:

They have a set of rules. If you don't push the right button or follow the right sequence, you fail.

continued on page 11



DECEMBER 2000 Volume 19, Number 2

The Avalanche Review is published each fall through spring by the American Avalanche Association, Inc., a non-profit corporation co-sponsored by the U.S. Forest Service National Avalanche Center. The Avalanche Review welcomes the submission of articles, photographs and illustrations.

Please send submissions to:

Faerthen Felix--Editor
P.O.Box 428
Moab, UT 84532
tar@avalanche.org
tel: (801) 694-9585
fax: (435) 260-1192

Advertising :

Halsted Morris...Advertising Coordinator
535 Williams St.
Denver, CO 80218-3639
HM1HACKSAW@aol.com
tel: (303) 377-5802
fax: (303) 377-4439

Business and Subscription Office:

Jeff Brown—AAA Executive Director
P.O.Box 428
Moab, UT 84532
aaa@avalanche.org.
tel: (801) 694-9585
fax: (435) 260-1192
web: www.avalanche.org/~aap

The American
Avalanche
Association



Executive Director.....Jeff Brown

AAA Officers

*President.....Hal Boyne
*Vice President.....Bill Williamson
*Secretary.....Knox Williams
*Treasurer.....Don Bachman

Committee Chairs

Awards.....Rod Newcomb
Data.....Dan Judd
Education.....Don Sharaf
Ethics.....Janet Kellam
Membership.....Stuart Thompson
Research.....Ethan Greene
Search & Rescue.....Dale Atkins
Ski Area.....Onno Wieringa
Standards Awareness.....Craig Sterbenz
*Publications.....Faerthen Felix

Publications Committee

Faerthen Felix.....Editor
Blase Reardon.....Asst. Editor
Steve Conger.....Editor Emeritus
Sue Ferguson.....Editor Emeritus
Bruce Tremper.....Editor Emeritus
Halsted Morris.....Advertising
Jay Gress.....Web Asst..

The Executive Committee

Karl Birkeland, Janet Kellam, Gary Murphy

Section Representatives

Alaska.....Reid Bahnson
Eastern Section.....Bob Bailey
European Section.....Peter Höller
Intermountain North.....Fay Johnson
Intermountain South.....Dave Ream
Northwest.....Jon Andrews
Rockies.....Woody Sherwood
Sierra.....Gary Murphy
Member Representative.....Halsted Morris

Executive Committee denoted by *

The mission of the AAA is:

- A. To provide information about snow and avalanches;
- B. To represent the professional interests of the United States avalanche community
- C. To contribute toward high standards of professional competence and ethics for persons engaged in avalanche activities;
- D. To exchange technical information and maintain communications among persons engaged in avalanche activities;
- E. To promote and act as a resource base for public awareness programs about avalanche hazards and safety measures;
- F. To promote research and development in avalanche safety.

Subscription: \$20 per year (6 issues). The price of subscription is included with membership dues to AAA. See www.avalanche.org/~aaa for subscription and membership information.

Contributions: Please submit material eight weeks prior to publication date. Include address and telephone number. Please submit typed manuscripts by e-mail or disk (3.5", Zip or CD), using any popular word processing program. Submit any figures in B & W, or as a TIFF or EPS file (300 dpi resolution at 100%). We will return materials if you include a stamped, self-addressed envelope.

Articles, including editorials, appearing in The Avalanche Review reflect the individual views of the authors and not the official points of view adopted by AAA or the organizations with which the authors are affiliated unless otherwise stated.

© 2000 by the American Avalanche Association. Materials may be reproduced for research or classroom use. Permission is also granted for use of short quotations, figures and tables in scientific books and journals. For permission for other uses, contact The Avalanche Review.

FROM THE DIRECTOR'S DESK

Winter is getting here much quicker than some of us are ready for and maybe not quite quickly enough for others! Returning home with a good avalanche buzz from ISSW 2000, I can't help but continue to look at our world through rosy glasses.

I would first like to thank all those folks that were involved in putting on this year's ISSW. You all did an outstanding job! Big Sky Resort was a gracious host and the weather that was arranged worked wonderfully!

The big news is the action by the Board of Directors to change our name to reflect the shift in roles that this organization has taken. We are now known as the American Avalanche Association (technically we are still the American Association of Avalanche Professionals doing business as the American Avalanche Association. There is a legal process that we need to move through to completely make this shift).

Why the name change?

Background:

In August of 1998 a Strategic Planning Task Force Report was presented to the American Association of Avalanche Professionals (AAP) Governing Board for consideration at Sun River, Oregon. This report outlined three possible scenarios for discussion. The Governing Board discussed Scenario 3, refocusing the AAP on a Mission Niche; however, no formal action was taken.

In April of 2000, at the Spring General Board meeting held in Alpine Meadows, California, the General Board discussed a shift in roles for the AAP. This shift would position the AAP as the umbrella organization for the avalanche community in the United States. The thoughts behind making this shift were based on several factors:

- The avalanche community is decentralized as there is no central point of contact. AAP membership is looking for instructor certification, course curriculum, instructor materials. Potential National sponsors suggest the organization/consolidation of the avalanche community prior to giving serious consideration to partnership development.
- Other groups are being created to attempt to address avalanche related needs. These groups do not necessarily have the skills or the avalanche experience. The public is concerned about the quality of avalanche education programs. Funding Avalanche centers continues to be a challenge.
- Technology continues to change the way the world communicates. Current funding programs do not provide for thorough integration of these new and emerging technologies.
- New ways to access avalanche terrain continue to emerge adding to an already stressed avalanche system. People continue to build in mountainous areas. Space is at a premium and we must continue to address land use planning challenges.

The time is right for the AAP to take on a new role. In order for the AAP to make this shift the organization needs to re-evaluate its focus and develop a plan for action.

In September of 2000, at the Fall General board meeting held at Big Sky, Montana, the Board changed the name of the AAP to the American Avalanche Association. This change was made to reflect a broader scope and to more clearly signify the establishment of the American Avalanche Association as the umbrella organization for the American Avalanche Community.

Work is currently underway to develop a Strategic/Business Plan by an ad-hoc committee created at the Fall Board meeting. This committee is comprised of Russ Johnson, Bill Williamson, Don Bachman, Andy Gleason, Faerthen Felix and Jeff Brown. This group, less the Executive Director, comprises the incoming Executive Board. A very rough draft has been created and the process has begun. They have been tasked with creating a working document to provide the organization a more specific plan from which to operate. A lot of this activity is driven by the goal to create a more permanent funding mechanism for the avalanche community, including the American Avalanche Association. Our goal is to have this plan defined for presentation to the National Avalanche Awareness Advisory Board, which is scheduled to meet near the end of January 2001.

AAA Board Changes

The Alaska Section was seated on the Board with Reid Bahnson serving as the Alaska Section

Representative. He will work closely with David Hendrickson, to ensure that Alaska is able to attend American Avalanche Association meetings.

Kelly Elder stepped down as the Education Chair to tackle a new job and Don Sharaf was ratified to fill this position, Janet Kellam is the new Ethics Committee Chair, and Karl Birkeland stepped down as the Research Chair with Ethan Greene stepping in.

The election of officers was held at the general membership meeting and the new Board of Trustees, to take effect January 1, 2001, is as follows:

Officers:

(elected every two years, on even years. Executive board denoted by the *)

- *President Russ Johnson
- *Vice-President Bill Williamson
- *Secretary Andy Gleason
- *Treasurer Don Bachman

Section Representatives:

(elected every two years, on even years):

- Alaska Section Reid Bahnson
- Eastern Bob Bailey
- European Peter Hoeller
- Intermountain North Fay Johnson
- Intermountain South Dave Ream
- Northwest Jon Andrews
- Rockies Woody Sherwood
- Sierra Gary Murphy
- Member Affiliate Halsted Morris

Committee Chairs:

(appointed every two years, on odd years)

- Awards Rod Newcomb
- Data Dan Judd
- Education Don Sharaf
- Ethics Janet Kellam
- Membership Stuart Thompson
- *Publications Faerthen Felix
- Research Ethan Greene
- Search & Rescue Dale Atkins
- Ski Area Onno Wieringa
- Standards Awareness Craig Sterbenz

The formal agreement between the American Avalanche Association and the Forest Service National Avalanche Center has been finalized and it should be signed by the time this edition of the Avalanche Review goes to press.

The American Avalanche Association continues serving as a technical advisor on Avalanche Hunter, an IMAX film. Production is expected to begin in February of 2001. The final phase of the National Science Foundation grant process is about to come to a close. We are involved because this film will serve an important role in helping to continue one of our missions: to promote public awareness programs. Michael Friedman, a professional member of this organization, serves as the driving force behind this project.

Production assistance continues for the development of "Avalanche Tips" for television.

The report from the avalanche instructor certification committee was presented to the board. The board was encouraged with the report and recommended action. The committee was tasked with addressing several issues and clarifying a few more. It was decided to publish the revised proposal in an upcoming issue of the Avalanche Review for general membership comment prior to board review and possible action next year. A short article outlining the background for instructor certification is included in this TAR.

Work on the Outdoor Equipment hangtag program continues. The American Avalanche Association, working with the FS National Avalanche Center, is looking into several possible methods for moving forward with this well received concept.

A relationship with SnowSports Industries of America (SIA) has been established. SIA hosts the large ski show each March in Las Vegas. They have provided booth space, free registration for American Avalanche Association members, and inexpensive travel and accommodation packages. The American Avalanche Association with the FSNAC will also be providing two Avalanche Awareness presentations at this show. See the SIA ad in this edition of the Avalanche Review for registration details. This is a tremendous opportunity for this organization. It will enable us to continue to further our rapport with the snow sports industry.

continued

We are actively pursuing booth space at the winter Outdoor Retailer Show in January. More to follow.

A very positive article was presented to the Outdoor Retailer Industry in an article published in Outdoor Retailer magazine. I feel that it represents the current avalanche situation very well. The article is titled "On Dangerous Ground" and appears in the October 2000 issue. This magazine is available on line at: www.outdoorretailer.com, although the October issue is not yet posted (it might be there by the time you receive this TAR).

Due to the great response from last year's explosive workshops, the Board decided to continue to host these valuable programs again this season. Bill Williamson will spearhead this project again and we'll get the dates and locations out as soon as they are firmed up. The feedback from last year's participants was very positive and, if you or your organization uses explosives for avalanche control work, you might give attendance serious consideration.

Dan, Howie, and group have outdone themselves. The Westwide Avalanche Network (WAN) has developed a new and revised program for collecting and storing data. The program is called WAN DATA. I had a chance to spend a little time with it at the ISSW and it seems to be something that even a dataphobe like me can use. For more information contact Dan Judd at: djudd@juddcom.com or 801-424-2889 or Howie at: howie@nohowinc.com or 801-742-3333.

A software sponsor of the American Avalanche Association is E.S.R.I. They create specialized GIS software. They have been very generous in donating several powerful packages to this organization. The plan is to load them onto a new NT server in the near future. The biggest package is called ArcIMS and is an internet-based map service program. Once it is up and running we will get out the word and the details of how to access this program.

An informal group was formed at the ISSW to look at GIScience issues. The thought behind the formation of this group was to start a dialogue between avalanche types using and anticipating using GIS applications. One of the main ideas was to start anticipating issues and laying the groundwork early for the future. The group, as of now, has representatives from the US, Canada and Austria. Several other nations have expressed an interest in participation. If you have any interest in learning more about this group or wish to get involved contact Steve Conger at: sconger@dot.state.ut.us

As for me, I'm anxious to see what this winter has to offer as it is definitely time to make some turns!

**Happy Holidays,
Jeff Brown
Executive Director**

PEOPLE

AAA Presents Awards

Rod Newcomb
AAA Awards Committee Chair

The AAA presented a series of important awards at its October 2 membership meeting at Big Sky.

Honorary Membership Awards

Honorary Membership is the highest award bestowed by the AAA. It is given annually or less frequently to individuals who have distinguished themselves by special achievement in the field of snow avalanches. Typical criteria for the award are outstanding accomplishments related to research, avalanche forecasting or control, and avalanche education and safety. Current membership in the AAA is not a prerequisite for candidacy, though it is customary. The AAA usually makes the award at the Annual Meeting, but can present it on special occasions with the approval of the Governing Board. The award's purpose is to bring honor to the awardees, to provide inspiration to the membership, and to emphasize the programs to which the AAA is dedicated. The number of awards will be restricted so as not to include more than 20 living individuals at any one time. Past recipients include such avalanche luminaries as Montgomery Atwater, Peter Schaerer and Ed LaChapelle.

The AAA awarded Honorary Membership to two very distinguished members of the avalanche community, Bob Brown and Sam Colbeck. Both have contributed significantly over the past three decades to our knowledge of snow mechanics and metamorphism. Presenters for the awards were Karl Birkeland and Hal Boyne.

In his citation for the award to Bob Brown, Karl Birkeland reported that Bob's path to avalanche research started differently than that of many avalanche workers. When Bob arrived at Montana State University (MSU) in 1969, he wasn't a skier; he was a rocket scientist on the Apollo Project looking for a Ph. D. Despite this unlikely and perhaps inauspicious start, Bob's snow science accomplishments in the thirty-one years since have been significant.

After meeting early snow researchers at MSU, Bob quickly learned to ski and became an active snow researcher. As Karl noted in his citation, "He investigated cutting edge topics from the beginning, and his 200-plus papers include over 65 publications in refereed scientific journals that cover a range of topics of interest to our discipline." Throughout this work, Bob has shown a talent for collaboration and cooperation. He served as a primary catalyst for the fruitful partnership between MSU's Civil Engineering and Earth Sciences Departments. Much of his research was completed and published with students, other

researchers at Montana State, and snow scientists from Japan, India, and Switzerland. He advised students on their dissertations, generated over \$3 million dollars in research money, and served as papers chair for ISSW, editor for issues of the *Annals of Glaciology*, Vice-President of the International Glaciological Society, and the Dean of the Graduate School at Montana State University. However, Karl's citation observes that "it isn't the accomplishments or awards that strike most folks about Bob. Instead, it is his easygoing attitude, the smile on his face, his selfless help of any student interested in snow, and his love of telemarking through powder snow." Karl also notes that, at age 60, Bob took up whitewater kayaking, proving once again that it is never to late for a rocket scientist with an adventurous spirit to learn.

Sam Colbeck retired this year from the U S Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL), where he spent most of his thirty-year scientific career. While there, he wrote 60 journal articles, 25 reviews, over 25 CRREL reports, gave more than 20 conference papers, and edited 8 books and proceedings. He has also been active in several professional organizations, including the AAA, of which he was a founding member. The honorary membership recognizes this work and its significance to avalanche workers.

Of Colbeck's considerable work, that which is most familiar to avalanche workers is his research in snow classification, wet and dry snow metamorphism, and the mechanical and electrical properties of snow. He served as chairman of the Working Group on Snow Classification, which published *The International Classification of Snow on the Ground* in 1990. The citation for his award noted that his research in dry and wet snow metamorphism has provided a clear picture of these processes for avalanche workers, and that his recent research into equilibrium metamorphism in dry snow has resolved several inconsistencies in earlier theories. As Hal Boyne's citation states, Colbeck "has been a tireless researcher and a major contributor to our knowledge of snow properties over the last 30 years, and we in the avalanche community owe him a debt of gratitude for his research, insights and persistence in unfolding the mysteries of snow on the ground."

The Bernie Kingery Award

The AAA awarded Don Bachman the Bernie Kingery Award for sustained career contributions by a dedicated avalanche field professional. John Montagne presented the award to Don. In his citation, John traced Don's career, most of it field based. Don started as a ski patrolman at Berthoud Pass, Colorado, in 1960, then worked with the Colorado Avalanche Warning Center in 1975, did field studies for the the University of Colorado's Institute for Arctic and Alpine Research (INSTAAR), and collaborated on other avalanche

studies on the Seward Highway, I-80, Greys River Range, and Berthoud Pass. His experience and expertise on Rocky Mountain avalanches culminated with the avalanche forecasting and safety responsibility for the southern passes of the San Juan Mountains in Colorado during the 1990's. In addition, Don was instrumental in founding The International Snow Science Workshop (ISSW) in 1982, and from 1997-2000 served as the AAA's distinguished Executive Director. The citation states that "In its growing professional prominence, the AAA owes much to the effective work of Don Bachman. He is not only a superb "field man" but possesses expertise in the entire scope of avalanche activity."

Special Service Award

Steve Conger was the recipient of the Special Service Award because of his long and dedicated work as editor of *The Avalanche Review*. Sue Ferguson, the founder of TAR and an Honorary Member of AAA, was the presenter. The Special Service Award recognizes specific and outstanding achievement in the service of North American snow avalanche activity. Generally the Governing board initiates the nomination and approval process for this award. It is not necessary that the recipient be a member of AAA, but that has generally been the case.

For more information or to propose an award, see www.avalanche.org/~aaap/awards.html

DON BACHMAN SNOW SAFETY SPECIALIST

CONSULTATION ON

AVALANCHE MATTERS, FEASIBILITY, OPERATION, INCIDENT REVIEWS FOR RECREATION AND INDUSTRY INTERESTS

Contact:
avalpro@theglobal.net

New! Snowpro 2000

Generate High Quality Snow Cover
Profile Graphs!

Introductory Price \$179*

www.gasman.com

- * Easy to Use - Drag & Drop Interface
- * Industry Standard
- * Multiple Graphs
- * 9 Categories of Grain Shape Classifications Symbols with detailed Grain Shape Sub-classes
- * Plus and Minus Hardness Graduations
- * Computes Snow Pack Average Density, Cumulative Shear Stress, Ramsonde, Snow Load and more
- * Conforms to International IASH 1990 Snow Profile and Symbols Standard

Gasman Industries Ltd.

3318 Wascana Street,
Victoria B.C. Canada V8Z 3T8
Tel: +1-250-881-4117 Fax: +1-250-727-2695

Email: info@gasman.com

*Shipping extra, Assembly USA
Regular Price \$199 - Special Offer Until Dec 31/2000

Tim Lane: "Professor de Avalanchia" Pozo Negro, Chile

by Jerry Roberts

I'm riding in the backseat of a vintage 1948 Buick "RoadMaster", running late for a flight at the Santiago airport. My head rings with a Pisco buzz, the result of a four-hour lunch with an old friend. We reviewed lies and good times we've shared while skiing the Rockies and Andes, and in other adventures. In my mind, I compare this old ride—belching out fumes and rattling down the highway—to my old friend: Señor Tim Lane. Both are genuine, classic originals.

When I left Lane at the Restaurant Tongoy, he was on his way to an end of season company party to give an unscheduled lecture on responsibility...or was it irresponsibility? The company had just cut short his avalanche forecasting job at the company's Mina Andena (Andena Mine), despite another large Andean storm on the way. The irony was that the company had spent a hundred thousand dollars on chains for a big mine truck but had no extra dollars to keep a forecaster on the job to close out the wet slab cycle. I remember Tim's parting words, "It's too bad I'm self-



destructing at the Sur Sur, I kind of like it up there." I haven't talked with him since, so he may have called Knox for a job this winter.

Lane and I met in the mid-70's at an avalanche school in Jackson when we both labored winters for Colorado Outward Bound. I had never seen a person that could turn a ski with old Ramers-minus-heels with such grace in all conditions. He was a true joy to watch. His love of snow led him to avalanche studies and a career in forecasting to continue his search for the "Perfect Turn".



Avalanche control problems at Sur Sur. Aconcagua in the background.

married and had two boys. He began forecasting for roads and buildings at various mines: the Andena, Desputada, Pimenton and El Indio.

Lane's work has made him many friends over the years, but none more heart felt or friendly than the Chilean Military at their base camp near Portillo. This is surely not the Pinochet military of the 70's, but a newer generation that enjoys snow and skiing. Tim taught many avalanche schools there. It was amusing to watch him with the officers after a few bottles of Chilean wine yelling "Hijo Fidel!", his smiling and bearded face laughing with them. Lane has an interesting way with people. You are left wondering why he's not locked up, but somehow he makes it happen—a true sociopath. Geographically, Chile is a large country but socially, a very small one. People of the north know people of the south and the avalanche world is very small with many Americans and Europeans in the Chilean snow community. Tim is respected and liked in both worlds. He's ragged but he's real.

Chile experienced some significant storms the winter of 2000. The last two weeks of June and the first eight days of July saw three storms that dropped twelve meters of snow. There were no storms to speak of the last half of July or August and not until mid-September did the Andes receive a spring storm, which delivered another five meters. I headed south.

On my arrival, I entered Lane's unofficial oficina: the Café Express in Los Andes, an hour down the road from the mine. Lane walked in with his new avalanche dog, a Golden Retriever named Bacan, which is Chilean slang for cocky. Bacan is his third dog in as many years. He's had some bad luck with old age and poison.

We had several hours to kill before we were due to eat chicken with Rene Leon—Jefe of Roads at the Andena—so Lane and I sat down and shared a Crystal. Catching up on the last two years, our conversation wandered greatly but finally came back around the corner. Stream of consciousness? My girlfriend says that we're just two old shaggers who can't keep a thought going. Maybe she's right. I asked Lane about the state of the art hardware and weapons at the Andena for avalanche forecasting and control. This arsenal includes high-tech weather computers, Campbell units, Gaz-ex, Cat-ex, avalaunchers and military weapons. One of these, a 75mm recoilless rifle, blew up and killed a military gunner in June.

Lane replied that he doesn't get near the computers. He browses the weather printout in the morning, then heads out the door and into the field. Old School for sure. "What is" is a certainty in Lane's life. He stares out the window and asks "Is it snowing? Is it blowing? What are the temp and R.H.? Are the clouds reflecting heat back into the snowpack?" Lane mused: "You begin the season in your mountains and you know what is happening. Weak layers, slabs. What is it going to take?" Lane doesn't get lost in scientific dogma. He likes to graph his pit profiles by hand. He said, "I don't like Snowpro. It's static. It doesn't have any feeling."

Emerson (Ralph Waldo) described intuition as primary wisdom. As a practitioner, Lane has made it an art form. I've seen few forecasters pick up more information and clues through their feet and hands than Tim. He's a real character that resides in the Zen zone. A man of the 90's ...the 1890's.



The upper mine at the Andena called Sur, Sur (South, South)



Fixed avalauncher position at Sur Sur.



Tim Lane and Bacan at the study plot.



Snowmetrics

**TOOLS FOR
AVALANCHE FORE-
CASTING AND SNOW
RESEARCH**

**Snow Board Water
Equivalent Samplers
Snow Density Kits
Ram Penetrometers
Pocket Microscopes,
Magnifiers,
Thermometers, Field
Books, Scales, Tape
Measures, Folding
Ruler**

**Box 332
Fort Collins, CO 80522
Phone/fax (970) 482-4279
snow@verinet.com**

He chased winters in both hemispheres for many years. It became an annual migration from New Mexico and Colorado to Portillo Chile. He worked as a ski patrolman in the south and did whatever paid the bills up north - guide, dishwasher, shepherd. In the early 80's, Tim started forecasting in Portillo.

I visited Tim in Portillo in 1980. I lived in a snow cave near the hotel, skied, and studied the maritime snow pack and the culture with Mr. Lane. We talked of snow jobs upon our return to Colorado. At the end of the season we visited Dick Armstrong in Fort Collins and asked him for work in Silverton, Colorado. The INSTAAR Research Project was coming to a close but Dick needed continued data for his research. The Forest Service needed some observations and Knox Williams at the Colorado Avalanche Warning Center had some small change to help pay the bills at the Avon. So we moved to Silverton that fall and into a serious drought that had us walking on dry ground searching for what little snow we could find in the shaded north gullies.

That life continued for several years. We followed the snow until the late eighties when Tim suddenly became a Permanent Resident Alien in Chile, got

Your membership in AAA includes registration for the

March 9 -13, 2001

SIA SNOWSPORTS SHOW 2001

Las Vegas Convention Center



- ▷ 1,200 Brands
- ▷ Celebrities
- ▷ Athletes
- ▷ Networking
- ▷ The largest winter sports show in the world

SIA Snowsports Show 2001 – Where the Industry Gathers

See the latest gear and clothing for the 2001-2002 season

Special travel/lodging packages are available

You work hard to help people enjoy snow sports. Come to the SIA Show to check out the new products and enjoy Vegas' unique attractions.

Hours:

- Friday, March 9 9 am-6 pm
- Saturday, March 10 8 am-6 pm
- Sunday, March 11 8 am-6 pm
- Monday, March 12 8 am-6 pm
- Tuesday, March 13 8 am-3 pm



photography: Scott Markowitz

For a registration form, log onto:

www.avalanche.org/siavegas.htm

Proud Supporter of the Industry



SnowSports Industries America • 8377-B Greensboro Dr. McLean, VA 22102-3587 USA • P: 703-556-9020 • F: 703-821-8276
e-mail: siamail@snowsports.org • Consumer Site snowlink.com • Industry Site snowsports.org

Get the Avalanche equipment you can live with!

SOS Avalanche beacons, a lifeline for your survival.

Completely buried avalanche victims often have less than 20 minutes to live; **it's a race against time.** Your survival will depend on properly equipped and trained companions... and your avalanche beacon! Avalanche beacons improve the odds of survival and help avoid the most devastating of consequences. All those who venture into the snowy environment must travel equipped for companion rescue; with an SOS beacon, probe and shovel.

The ultimate avalanche gear combination:
An avalanche beacon, a lightweight, collapsible aluminum shovel, with a 2.4 meter MINI-PROBE or a snow saw stored in the handle. Your choice of three different snow scoops.



SLED BUG

- Attaches to snowmobile wiring harness
- Fully self contained
- No batteries required



SURVIVAL ON SNOW Inc.

— *Avalanche Safety Equipment* —

Box 1, Site 218, RR 2 St. Albert, AB Canada T8N 1M9
Phone (780) 973 5412 • Fax (780) 973-3318
E-mail info@sos-find.com

www.sos-find.com

EDITOR'S NOTE

Previous Issue Correction:

Unfortunately, we failed to credit Steve Conger for his video notice about "The Greatest Snow on Earth: Utah's Skiing Story". Sorry Steve!

Faerthen Felix, Editor

SECTION REPORTS

What's Going On In Your Area?

Intermountain North

As you can imagine, planning the October ISSW 2000 has been the primary focus of the Intermountain North section. Over 1/3 of the section members are from the Big Sky and Bozeman area and have all been actively involved in the preparations.

In terms of areas of interest within the section, most discussion revolves around the continued issue of explosive use. I am on the NSAA explosives committee and have been in communication with most of the other ski patrol directors and explosive users in this region. Fortunately, relationships with explosive distributors have improved over the past couple of years. Locally, I think that the AAA-NSAA guidelines have helped establish credibility and involving the local distributors in our training has been mutually beneficial, as well.

Fay Johnson, Ski Patrol Director, Bridger Bowl Ski Area, MT

Northwest

It is hard to get people to gather for a spring section meeting, so I thought I would try to correspond by mail and see what kind of response I received.

In a survey, I told them what AAA was up to and the direction we are trying to take. Then I asked the NW membership what they would like to see the AAA accomplish. I received about 20 responses to my letter.

In general, from the responses I received, the membership would like to see AAA take a more active role in creating criteria for avalanche courses in the US. They would like to see guidelines for a basic recreational course. Also, they would like to see a list of certified instructors through the AAA.

Jon Andrews, Avalanche Forecaster, Stevens Pass, Inc., WA

Europe

The year 1999 was characterized by a couple of catastrophic avalanches in Europe, which were caused by three storm periods in late January and February. A total of 62 people died in avalanches during this period in Switzerland, France, Italy and Austria.

As a consequence of these disasters, the governments decided to spend more money for avalanche control and research. A discussion of the guidelines for hazard mapping was also initiated. As a result, design criteria for hazard mapping in Austria were revised.

The winter of 1999-2000 again brought plenty of snow, especially at the end of February and the last two weeks of March. In many locations, new snow totals were significantly above average. Accidents were concentrated in the backcountry, however, including two accidents claiming 9 victims in the Jamtal and 11 victims near Kitzsteinhorn, Austria.

There were many snow and avalanche related conferences in the year 2000, including symposiums in Italy, Norway and Austria.

Peter Höller, Research Scientist, Institute for Avalanche Research, Innsbruck, Austria

WHAT'S NEW



High-Speed Search & Rescue

The m-series continues leading the world in avalanche technology...

When only the best will do...

- Fastest response time
- Easier to use
- Superior 80 m Range
- 5-year warranty
- Safety switches, not buttons
- FCC certified — exceeds all European DIN standards

Plus: Avalanche Probes, Shovels, Backpacks, Snow Saws, Bivvy Sacks, First Aid Kits, Inclimeters, and Ultra High-Performance Wool Sportswear



USA 603-746-3176

Canada 800-234-6711

ORTOVOX m2 Avalanche Transceiver Unveiled

ORTOVOX has made speed and ease of use their top priorities with the new m2 Avalanche Transceiver. The LCD screen gives the user the exact visual steps they must take in order to get to the pinpoint search as quickly as possible. Along with the LCD screen, the acoustic external speaker gives constant audio signals for the fastest possible rescue. A lighted arrow indicates the direct flux line. The m2 offers the greatest range in the industry and also the fastest search due to its improved microprocessor cycle speed. All controls are handled by a single, easy-to-use switch—no buttons to push. All of ORTOVOX's avalanche transceivers adhere to all strict European DIN standards for the utmost safety.

Features:

- High-speed search and rescue, even for less experienced users. The ORTOVOX m2 uses the fastest possible pulse rate to speed the searcher's reaction time. The highly efficient display shows the most effective search path—no detours/serpentine and no wandering around. No independent and complete tests published have proven any other avalanche transceiver faster than the m1—and the new m2 is even faster!

- "Safe" search for multiple avalanche victims (signal isolation and recognition via the volume control switch)

- 80m range (due to digital/analog technology)—the longest range on the market

- Fool-proof switch integrated into the body belt
- Fail-safe, fast switch-over to receive mode saves time
- Continuous receive signal cannot be accidentally switched to transmit mode
- Fast emergency switch
- Uses two standard AA batteries for up to 300 hours of transmitting capacity
- 5-year Express Warranty

For additional information, contact: Marcus Peterson
Information provided by ORTOVOX, USA
(also see ad this page)

ORTOVOX Carbon Fiber Avalanche Probes

The new ORTOVOX carbon fiber avalanche probes are extremely lightweight, yet highly flexible and impact-resistant. Because the probe bore channel head is larger than the diameter of the probe tube, the probe can be pulled out very quickly. ORTOVOX's unique fastener system makes assembly fast and easy. And the probes will not freeze up!

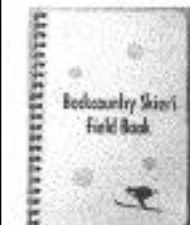
Carbon 200 Light:
Material: Carbon fiber
Length:
200 cm (79 in.) extended
33 cm (13 in.) folded
Weight: 145 g (5 oz.)
Color: Black

Carbon 240 Light:
Material: Carbon fiber
Length:
240 cm (94.5 in.) extended
40 cm (15.75 in.) folded
Weight: 185 g (6.5 oz.)
Color: Black



Information provided by ORTOVOX, USA

THE BACKCOUNTRY SKIER'S FIELD BOOK



Are regular snowpit profiles part of your guide service's avalanche forecasting system?

The ideal tool for the professional ski guide to record snow stability assessment observations.

- All pages "Rite in the Rain" paper
- 30 snowpit study forms
- Avalanche search and rescue flow chart, rescue log pages, and accident site mapping page
- Pre-trip phone numbers page
- Rutschblock and Shovel-Shear test score descriptions
- Plumb bob slope angle guide
- And lots more handy features

\$15 each (S&H included)
Colorado residents add 3% sales tax
Sorry, no cash or CODs

MasterCard/Visa 303-377-4439
Check or money order (US\$) payable to Hacksaw Publishing, Inc.
535 Williams St.
Denver CO 80218-3639 USA

WASATCH TOURING

NEW for 2000

ORTOVOX M2

NEW Advanced Digital Search

VERTS

NEW The Ultimate Snow Climbing Tool



WINTER ENGINEERING



NEW Bubble Site Inclimeter



Snow Study Equipment Snowsaws

SNOW PIT TECHNOLOGIES

NEW Snow Profile Field Notebook

VOILE Shovels, Skis, Bindings

LONE PEAK Radios & First Aid Packs

Call or Write for a Free Catalog & Pro Form or Visit Our Virtual Avalanche Store
www.wasatchtouring.com

WASATCH TOURING

702 East 100 South
Salt Lake City, Utah 84102

801-359-9361

TOLL FREE FAX LINE

1-888-SNOWSAW

1-888-766-9729

AAA AVALANCHE INSTRUCTOR CERTIFICATION

Rod Newcomb and Evelyn Lees

Where we are, and where we are headed.

At the October 1999 AAA avalanche education meeting at Alta, attendees were asked to write suggestions for the future direction of AAA avalanche education. The overwhelming response indicated a desire for a certification program for avalanche instructors.

This idea was reinforced at the Southern Rockies regional meeting at Alta in early April 2000. The consensus was that if certification among professionals avalanche educators were to occur, the AAA is the appropriate certifying body. At the Governing Board meeting at Alpine Meadows in late April 2000, an ad-hoc committee was formed with the mandate to "come up with a criteria for certifying avalanche educators and possibly a mechanism for applying for grandfathering." The original committee consisted of Rod Newcomb and Evelyn Lees (co-chairs), Doug Chabot, Ron Johnson, Jeff Brown, and Bruce Tremper. Faerthen Felix was later added to the committee and Jill Fredston and Doug Fesler offered suggestions during the first meeting via conference call. The committee had three meetings. The first two occurred in July and August in the Tetons. These meetings produced a rough draft for the "Certification of Avalanche Educators" that was presented to the AAA board at the September meeting in Big Sky.

The draft presented was a single-tier certification, with a resume-based application plus letters of recommendation. There would be no grandfathering of educators. All educators interested would need to apply, and meet the same criteria. Also, it was strongly emphasized that there be an adequate time for review and comments by the general membership.

The board voted to continue to pursue the idea, and made the ad-hoc committee an official sub committee of the Education committee, under the Chair of Don Sharaf. The board provided the sub-committee with a number of comments and ideas, which will be incorporated into the next draft. In general, there was approval of the high standard set for educator certification. There was active discussion with many members asking for consideration of a two-tier system (based on different levels of seasonal experience); and for further refinements of the qualifications needed. The sub committee met in Big Sky following the board meeting, with all members attending. Work will continue this fall, and a detailed draft will be published in the February or March issue of The Avalanche Review.

As co-chairs of the committee, we would both like to thank those members of AAA who have given input and opinions (all input is considered) and a big thank you to the committee members, some of whom drove hundreds of miles and gave their time to meet.

EVENTS

ISSW 2000 - Sorting Out the Aftermath of an 18 year Return Cycle

By Steve Conger

Every two years, presenters and participants from the snow-reached areas of the globe gather at the International Snow Science Workshop. An excellent history of this gathering can be found in the Proceedings of ISSW 94 - Snowbird. John Montagne and Peter Schaerer collaborated on a paper to guide the future of and assure that ISSW continues to serve the special requirements of pure and applied science, along with the practical needs of frontline avalanche researchers, control workers, and safety personnel.

They state in their chronicle of ISSW that:

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 forecasting and control relies much on experience...

The title, International Snow Science Workshop, was coined for the meeting organized and hosted by Montana State University in Bozeman during October 1982. "The Merging of Theory and Practice" became the motto and spirit of ISSWs to date. This past October, many of the same individuals responsible for that first ISSW along with some new talent organized ISSW 2000 at Big Sky Montana.

So how did Big Sky stack up to the big ones we remember? A lot of people (375) talk of Big Fork with a gleam in their eye, streets lined in aluminum, and a stories of comradery. Others speak of a time at Snowbird when a well-respected member of the community stood up and commented, "this is not a merging of theory and practice but a collision!"

I have spoken to a number of attendees at Big Sky, from those who were there at ISSW 82 - Bozeman, to those for whom Big Sky was their first time, to those who

have missed a few. Unanimously, participants felt it was the best-run conference they had attended, no small feat with 600+ attendees. Those initially leery of the day off in the middle were converts upon returning to the trough of knowledge with a day off of brain exercise.

Was the motto upheld and spirit maintained, did it avoid any collisions? Some practitioners and first-timers when pressed said they didn't come away with much. Some have even gone as far as saying, they now know how to be safe from avalanches - get one of those computer-based forecasting programs so they never leave the office. This high tech-meets-analog methodology was well demonstrated at Big Sky. Those presenters still in the 35mm color slide world found themselves caught in the one glitch of the meeting - video induced focus fuzzing. Not one person said they did not exchange experience or personally interact with other professionals, in fact Big Sky seemed to rank right up there with Big Fork regarding the informal interchanges.

The papers committee did an outstanding job in their selection of posters and talks. Again, metaphorically tying it to the snowpack of a big cycle, how was the make-up different from years past? Without any observation standards to go by, practitioners presented about 22% of the 36 papers at Big Fork. Snowbird saw 17% of the approximately 60 talks on the practice side. Big Sky with n=63 provided us about 27% practitioner content. (The outlier Sam Colbeck was removed from all cases due to his outstanding ability to merge theory and practice and talk about it to any of us). That Doug Richmond layer was there again. At Snowbird, he gave one of the most influencing presentations entitled "Repeated mistakes by Avalanche Professionals." His poster at Big Sky capturing "Research We'd Like to See" will provide seasons of inspiration.

ISSW 2000 - Big Sky, it was a big cycle, it's now historical records. There's a lot to be learned when the proceedings come out.

AVALANCHE COMMUNITY EVENT SCHEDULE

2000...

November 9-12, 2000
International Commission on Alpine Rescue (ICAR) Meeting: Moreno, Italy
Meeting moved from original Grand Canyon venue. *More info:* Dale Atkins, US Representative to ICAR

2001...

March 9-13, 2001
SnowSports Industries America (SIA) Trade Show: Las Vegas, Nevada
SIA is the big ski industry trade show. AAA will have booth space and members are invited to attend this non-public event. *More info:* see ad in this issue, or www.siavegas.com

March 25-30, 2001
European Geophysical Society, XXVI General Assembly: Nice, France
"This extreme snow avalanche winter (January and February 1999) has caused European avalanche scientists and experts to rethink existing methods used to forecast avalanche triggering and to calculate avalanche run out. This session is devoted to the state of the art in snow avalanche science. It will be focused on snow avalanches problems including formation, dynamics and protection aspects."
More info: <http://134.76.234.216/nice01pro/nhs.program.htm>
Convener, Naaim, M. Mohamed.naaim@cemagref.fr
Co-Convener, Vilaplana, J.M. jman@natura.geo.ub.es
Abstracts due: December 1, 2000

July 9-13, 2001
21st International ESRI GIS User Conference: San Diego, California
"This is the largest Geographic Information System Conference in the world and one that anyone using GIS should attend at least once. For the first time there will be

moderated sessions specifically for Ski Area Practitioners and Avalanche Forecasters/Snow Scientists to share their experiences and applications. This is a broad range of users from universities, guided service companies, ski resorts, departments of transportation, USFS, engineering/consulting firms, and more." *More info:* <http://www.esri.com/events/uc/index.html> *Abstract submission form:*

http://gis.esri.com/uc2001/papers/abstract_form.cfm
Abstracts due: November 3, 2000 (this date will be extended for snow and avalanche papers)

September 3-7, 2001
Avalanches and Related Subjects, II International Conference: Kirovsk, Murmansk region, Russia
"The intent of the conference is to sum up the results of this [avalanche] work and to provide wide communication between Russian avalanche persons and world avalanche community members for exchange by ideas and information." *More info:* P.Chernous@apatit.com
Abstracts due: April 1, 2001

October 28-November 2, 2001
17th National Avalanche School—Phase I: The Canyons Resort, Park City, Utah
6-day classroom session with the country's leading avalanche instructors. Phase II field sessions will be held at assorted western venues during the 2001-02 winter season. *More info:* www.nsaa.org

2002...

October 6-10, 2002
International Snow Science Workshop (ISSW): Penticton, BC Canada
"A Merging of Theory and Practice". *More info:* Jack Bennetto

*Please submit information about upcoming events to tar@avalanche.org.

Dr. John Montagne Honored at ISSW Banquet

By Karl Birkeland

ISSW 2000 was organized by a group from Montana State University (MSU), Gallatin National Forest Avalanche Center (GNFAC), US Forest Service National Avalanche Center (FSNAC), and Bridger Bowl and Big Sky Ski Areas. The group used the opportunity to honor a local hero, Dr. John Montagne, at the banquet held on the evening of October 4. Karl Birkeland presented a slide show of classic images pirated from John's own photo collection in secret collaboration with family members.

John Montagne grew up in White Plains, New York. He studied Geology at Dartmouth College, and was a member of its famous Outing Club and President of the student body. During a geology field camp in Wyoming's Snowy Range, he met and fell in love with his future wife, Phoebe. Later, John and Phoebe married and honeymooned by skiing into a cabin in the Snowy Mountains.

The 10th Mountain Division

When John's class was graduated six months early to accommodate WWII enlistment, John entered the 10th Mountain Division. He and Phoebe moved to Camp Hale where they shared a cabin with Charles and Maynie Bradley. Charles would later found the famous snow studies program at MSU.

The 10th trained in Colorado and on Mt. Rainier. Eventually, John was sent to Italy, where the 10th battled their way through the Italian Alps in a number of famous battles, including Riva Ridge on Mt Belvedere, which blocked the Po River valley. John was awarded a Bronze Star. After the war ended, the 10th stayed in Europe for a while and John taught climbing to other soldiers in Austria.

Back in the US, the troops from the 10th spread out all over the west and became pioneers in most things related to mountains, including snow and avalanche research, avalanche control techniques, and ski area development. John went to Jackson Hole, Wyoming. The Tetons were a natural place for John and Phoebe since Phoebe was from Laramie.

In Jackson Hole, John surveyed the lift line at Snow King, taught high school science, and helped coach the ski team. He then became a ranger and naturalist for Grand Teton National Park and was among the park's first Climbing Rangers in 1947. After a couple years, John accepted an offer to work at Crater Lake National Park. However, when his boss said he could not build a small fence around his yard to keep his young son Cliff from running into the road, he quit and left after only a couple days.

John Becomes a Snow Scientist

He moved back to Dartmouth, and was an admissions officer for one year before enrolling in graduate school at the University of Wyoming, Laramie. John completed his M. S. and Ph.D. in Geology by 1952. He took a job at Colorado School of Mines (CSM) in 1953 and taught there until 1957.

John left CSM for Montana State University where a geology department was just being formed. Leaving a good job at an established institution was not easy. One big draw was his old Camp Hale roommate, Charles Bradley, who was among the organizers of the department. Another was the quality of life: more rural and close to Yellowstone National Park, Jackson Hole, mountains and snow.

Soon after John arrived, he became the head of the volunteer ski patrol at Bridger Bowl. This and his past experience all led to avalanche work. He saw a way he could solve practical problems with science, and he began the journey of merging theory and practice. John noticed the importance of cornices in triggering avalanches in the Bridgers and did research on cornices and cornice-mitigation, including the use of jet-roofs. He became interested in snow metamorphism and crystal photography.



John Montagne "Merging Theory and Practice" by using a vacuum cleaner to test an anemometer. Dr. Montagne was honored at the banquet by the ISSW 2000 organizing committee for his outstanding service to the snow and avalanche community in general, and the ISSW in particular. Photo by Bill Hotchkiss, courtesy of the John Montagne collection.

John loved to teach in the field. He developed the first university-level course in snow and avalanches in the U.S. in 1963. The course included a half-day field trip every week and consistently had a long waiting list. This is one of John's proudest achievements.

John is a genuinely nice person, as well as an avalanche pioneer. He always goes out of his way to help students and others who are interested in snow. He has been extremely generous with his time, serving the avalanche community in many ways.

ISSW

By the early eighties, there had been some snow science meetings in Canada. But the first to use the title "International Snow Science Workshop (ISSW)" and trumpet the theme "A Merging of Theory and Practice" was held in Bozeman in 1982, and John Montagne was the chair. His graduate and undergraduate students, including Ron and Fay Johnson, Ed Adams, Bob Brown, Jim Dent, Bruce Tremper, Jim Woodmency and others, assisted.

John has served as ISSW Secretary for the past 18 years. He also served as a member of the organizing committee for ISSW 2000 and was in charge of International Protocol.

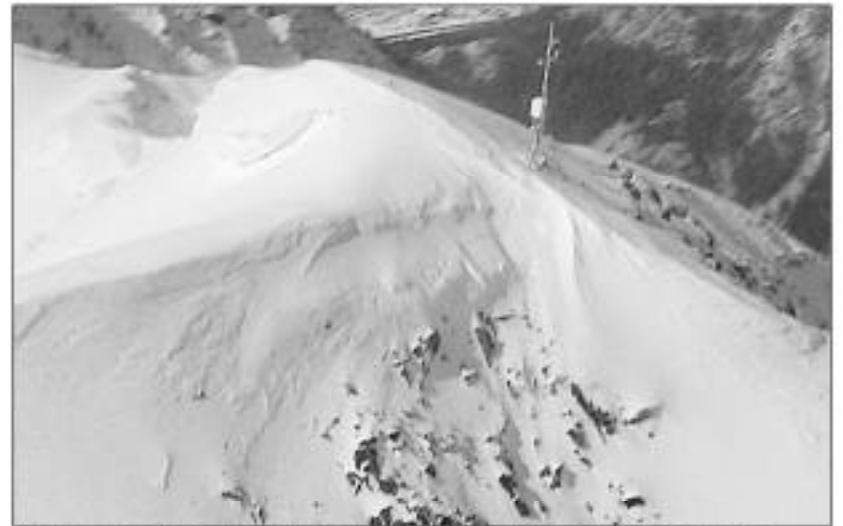
American Avalanche Association

Dr. Montagne has unselfishly served the American Avalanche Association in many capacities, including Education Chair, Awards Committee Chair, Treasurer, and from 1990 to 1994, as President. John also carves the wooden bowls that are the AAA's Bernie Kingery Award for sustained contribution by avalanche field practitioners.

Dr. Montagne is a past recipient of AAA Honorary Membership, which is the organization's highest award, bestowed on persons who have distinguished themselves by special achievement in the field of snow avalanches.

Measure the Alpine Environment

Rugged, Reliable Instrumentation for Over 25 Years



A station monitors avalanche conditions on Ten Mile Peak in Colorado.

Multiple Uses: monitor avalanche/ski conditions in the winter and fire weather in the summer. Measurements can include snow depth, snow temperature, fuel moisture, and fuel temperature.

Data Retrieval: radio, satellite, phone (including voice-synthesized and cellular), storage module, and more.

New!

Visit our **Alpine & Polar InfoCenter** ▶
www.campbellsci.com/alpine.html

- ✦ Find out more about our measurement instrumentation
- ✦ Learn how to automatically put your data on the Internet.
- ✦ Ask technical and sales questions
- ✦ Find links to consultants/integrators who use or install our products.



CAMPBELL SCIENTIFIC, INC.
 815 W. 1600th • Logan, Utah 84321-1784 • (435) 753-3342 • FAX (435) 750-9140 • www.campbellsci.com

AVALANCHE OF THE MONTH

Debris Flows and Floods at Arapahoe Basin

Alan Henceroth
Arapahoe Basin Ski Area

In Colorado, the summer of 1999 will be remembered by many for its heavy rains. These rains had already saturated the soils in the North Fork of the Snake River basin by July 28, so an intense afternoon thunderstorm that day unleashed numerous debris flows and floods that caused significant damage at the Arapahoe Basin Ski Area. According to Greg Kuymjian, U.S. Forest Service hydrologist, the event was locally very significant; "These may be the biggest flows in 10,000 or 15,000 years," he commented.

The weather of the preceding four months set the stage for the extraordinary debris flow. After a fairly dry winter, the Grizzly Peak SNOTEL site, which sits just outside the ski area at 11,100 feet, received above average precipitation in April, May, June, and July. 16.4 inches of precipitation fell during that four-month period, 49% above the thirty-year average. By the end of July, rain was falling almost every day, the North Fork of the Snake River was flowing well above normal, and grass was greener and higher than most people could recall. More importantly, according to Kuymjian, "The series of rains had caused soils in the basin to become saturated."

The Grizzly Peak SNOTEL site recorded .8 inches of rain on July 27. The next afternoon, a powerful thunderstorm dropped an additional 1.8 inches of water. The intense precipitation triggered numerous debris flows that profoundly impacted U.S. Highway 6 over Loveland Pass and Arapahoe Basin Ski Area. Kuymjian describes the storm as "a high intensity event that overpowered the soil's ability to move the water." Though the storm was most destructive at Loveland Pass and A-Basin, its effects were widespread; United States Geologic Survey scientists observed 80 additional debris flows along Interstate 70 between the Eisenhower Tunnel and Georgetown, Colorado.

The North Fork of the Snake River is the confluence of two distinct branches that flow from



two distinct basins. The northern branch has its headwaters near Loveland Pass, and the southern branch starts high on the East Wall within Arapahoe Basin. Both branches were in flood stage the afternoon and evening of July 28.

major culverts that run under the Arapahoe Basin parking lots. The clogged culverts forced the northern branch of the North Fork to run out of its course and head for the center of the ski area's base facilities.



Above the northern branch (outside the ski area), a major debris flow released on the Northwest flank of Grizzly Peak (13,427'), depositing twelve feet of rubble on Highway 6. Colorado Department of Transportation Highway Supervisor Ray Mumford observed the event. He described "[A] flowing river of rocks, water, and mud with boulders four to five tall tumbling across the highway." The debris clogged several

Water and debris from the East Wall also clogged culverts on the southern branch of the North Fork and forced this stream out of its regular course. The swollen northern and southern branches combined in the Arapahoe Basin base area. The flooding North Fork, which was almost completely out of its normal streambed, caused nearly \$200,000 in damage to parking lots, service roads, ski trails, the water treatment plant, and the first aid room.

Similar events were happening along the southern branch within the ski area. Numerous debris flows released between 12,500 and 13,000 feet on the East Wall, which ranges in elevation from 11,500 to 13,151 feet and totals ninety acres. The debris, which ran 1,500 vertical feet, narrowly missed Lenawee Chairlift. Kuymjian recognized this to be an extraordinary event. Although he admits additional studies are necessary, he commented "This may be the first time since post glaciation that debris flows have traveled this far down the valley."

The debris flows had profound effects on the shape of several of the East Wall's 33 avalanche paths. Start points for the debris flows were the same as starting zones for avalanches. Particularly large flows started in Corner Chute, TJ's Cornice, North Falls, and Snorklenose. The debris flows filled some wetlands and avalanche path runouts with soil and rock. Several new gullies were carved. All impacted areas have new and different surfaces. Some of the East Wall's starting zones became steeper and have continued to erode since the event. Rock slides have been seen and heard daily, and during later rain storms, the rumble of rockfall was continuous at times. The changed and still-changing shapes of avalanche paths, the less cohesive bed surfaces, and the addition of new potential triggers (rockfall) may create avalanche conditions not previously seen on the East Wall.



For photos and additional information on the storm of July 28, 1999 visit www.landslides.usgs.gov/i70/index.html#fig2

Snow Sounding Probe Call for Surveys



- Density (Weak Layers)
- Layer Wetness
- Layer Temperature
- Snow Grain Size
- Snow Depth
- Portable

Thanks for stopping at our ISSW 2000 booth to fill out our Snow Probe survey. Please return completed surveys now. (Email us for a blank survey form)

Capacitec
Bryan Manning
P.O. Box 819
Ayer, MA 01432
U.S.A.
978-772-6033
FAX 978-772-6036
email - sales@capacitec.com

METAMORPHISM

The American Association of Avalanche Professionals voted to change its name to the **American Avalanche Association** at the Fall Governing Board and General Membership meetings in Big Sky, Montana this October. The new name better reflects an expanded focus on representing the entire US avalanche community.

Several other changes occurred at this meeting. See the Executive Director's column in this issue for election, appointment and committee project details.

Ten new members were voted into the AAA at the Fall Governing Board Meeting in Big Sky. The new Member Affiliates are **Pascal Haegeli** and **Ann Mellick**. New Professional Members include: **Ted Cramer, Craig Gordon, Tim Keating, Chris Lundy, Steve Matthews, James Mayo, John Partch** and **Wes Schimmelpfennig**.

We're happy to welcome our new members!

Design of *The Avalanche Review* has shifted from Salt Lake City to Moab, Utah. **Kevin Hackett** takes over from **Suzie Elmore** after 11 years of beautiful work. Thanks Suzie!

Colorado...

Two Colorado stalwarts are moving on this season. After a very long tenure, **Hal Hartman** has relinquished the Snowmass Snow

Safety Director seat to pursue temperature gradient and snowmaking efficiency research and applications for the Aspen Ski Company. **John Brennan** will fill his position.

Meanwhile, on the other side of the hill, **Chuck Tolton** leaves the Ski Patrol Director position at Copper Mountain after 23 years to take on Risk Management for Vail Resorts.

The Colorado Avalanche Information Center (CAIC) has hired **Denny Hogan** as an avalanche educator to meet the demand for avalanche education in Colorado. He will work with **Halsted Morris**, who is in his second year as an avalanche educator with CAIC.

The CAIC has also upgraded two temporary forecasters from last year to permanent positions: **Stu Schaefer** at the Eisenhower Tunnel, and **Jerry Roberts** at the Silverton Avalanche Office.

Montana...

Tom Leonard—formerly of Snowbasin, UT—is the new Snow Safety Director of the private Yellowstone Club Resort.

-- Compiled by Faerthen Felix

Do you have news about other avalanche professionals? Send it to us at tar@avalanche.org

LIFE-LINK has always searched for better ways to travel in the backcountry, but we are equally dedicated to designing products that make backcountry travel safer. Life-Link has over 20 years of experience developing quality shovels, poles, probes, packs and snow science equipment. Our line of shovels are bombproof essentials and Life-Link poles convert into probes that actually work.

Life-Link probes are lightweight and assemble in seconds and our snow science gear helps the pros make the correct decisions at the critical time. The complete line of Life-Link packs, which are durable and lightweight, keep all of your gear organized and accessible.

When it comes to equipment, avalanche professionals trust the experience of **LIFE-LINK**.

800.443.8620
Jackson, WY
www.life-link.com

TOOLS OF THE TRADE



photo © Wade McKay/Bob Woodall FPI

LIFE-LINK® THE MOST TRUSTED NAME IN THE BACKCOUNTRY

← continued from cover

They have different levels of difficulty. As you achieve success at one level, you advance to more demanding situations. It is a game.

We can apply these same principles in teaching a dog to find hidden items - and people - in snow. The last one is a cornerstone in the process. With each increase in difficulty the training should continue to be a game; it should still seem like a positive experience to the dog. It should always receive its reward, be it a treat, a romp with a favorite toy, or an intense level of play with its owner.

If the day comes when you are at the scene of an actual avalanche burial and you help search, it must still seem to be the same fun activity to the dog. If they are not rewarded with play after a find, even that of a fatal victim, the dog will perceive it as a negative experience. Dogs are also excellent readers of body language. A real search can be a negative experience for a dog when emotions run high or when people become subdued after a body recovery. The bottom line is that if a dog perceives training or a search as a negative experience instead of play, it may be reluctant to conduct another search in the future. The future could be five minutes later if you are looking for multiple victims.

How to Play the Avalanche Dog Game

If your dog does not like to chase a toy, use its nose to find an out of sight toy, and or retrieve it, you may be wasting your time playing 'The Avalanche Dog Game'. More importantly, do not attempt the game if you are unwilling to adhere to the safety rules or equipment required for the advanced levels of the game. There is a critical difference between a computer game and teaching a dog to find people under snow. That difference is the fact that very real dangers exist in the second. For that reason, the following instructions stress safety.

Level One

The object of Level One is to train the dog to use its nose to find a toy. Start by holding your dog on a leash. Hold a toy it likes in your other hand. Toss the toy out of sight, perhaps the snow in winter or tall grass in summer. Then, using an excited yet whispered voice, ask the dog something like "Where are they? Where did they go?" The words are less important than using the same words and tone every time. Release the dog from the leash with a command word like "FIND". At the moment it finds the toy, and not until then, shriek with glee and generally make a fool of yourself over what a wonderful and bright dog it is for doing such an amazing thing. This praise is important. Dogs key on tones and body language, both good and bad. A basic rule of thumb in training is to give five parts praise for every one-part correction. In addition, any correction



My current SAR K-9, 5 year old Aniko, who has 2 finds and 1 assist (none in avalanche although she is avalanche trained). In this photo, she is playing with her toy with the "victim" she just found, buried in a snow cave. The "victim" is Diana Bristol, a member of La Plata County Colorado Search & Rescue who frequently assist me with SAR k-9 training.

must be immediate; a dog will probably not associate correction or praise with a behavior if it comes more than a few seconds after the behavior.

Level Two

Level Two is similar to Level One, except that you will need an assistant. Instead of throwing the toy, have the assistant wave the toy at the dog, then run off with it, disappearing in high grass, an open snow pit, or somewhere else out of sight. Use the same tones and release command as before. At the moment the dog finds the person and toy, reward it with praise and play as in Level One. Your goal is to have the dog learn that whenever it smells the toy, there is also a human scent present. You can vary the distance the assistant stands from the dog and the distance the assistant goes to hide, but don't make it so hard that the dog can't find the person and toy.

Level Three

For this level, you will need safety equipment and two assistants. Have the dog watch from a distance while you put one assistant - the "victim" - into a snow pit or snow cave. Do not play the game at this level unless you have the proper safety equipment and adhere to safety procedures. Specifically, you need:

- Avalanche beacons for you and the victim;
- A stable snow pack in which to make a cave;
- A spotter to ward off people who may accidentally run over your victim and also to help you dig;
- Shovels & probe poles;
- A way to mark the cave for rapid

location and excavation;

- A hand-held radio or other way to communicate with the victim;
- Warm clothes and a pad for the victim.

Preparing the scene takes about an hour for a small site. Tramp out an area that resembles a slide and compress the snow so it is hard like slide debris. Use snow blocks to close the entrance once the victim enters. Then toss and pack snow over them so the hole looks similar to the rest of the area. Never shovel snow directly onto the victim. Some victims like to keep a ski pole with them so they can poke it up through the snow to the surface if they have a problem. There's no need to do deep burials. The game will work as long as the victim is out of sight and the dog can run directly over them without collapsing the snow cave. The dog should watch this whole process the first time, while sitting in a car or tied up a short distance away. When you give the command and release the dog, it will probably find the victim in a minute or two if it has learned well in the game's earlier levels. When that happens, the hour or more you just spent setting up the problem can seem like a waste of time. It will, however, pay off in the long run.

Level Four

At this level, you start to simulate a real accident site. Follow the procedures for Level Three except do not allow the dog to see you bury the victim. When the dog can find a buried victim, add challenges and distractions. For example, don't allow the dog to see the victim arrive. Bring other dogs, bystanders, snowmobile noise, and other people digging onto the scene. Make snow angels or sit at various spots on your constructed avalanche site, in order to spread your scent all over the site. This distraction will help train your dog to alert on the victim instead of the place where you just spent 30 minutes digging. Vary your victims so it isn't finding the same person every time. Finally, have a competent well-briefed person do a burial without you or the dog watching. This last step trains you to rely entirely on the dog.

The purpose of the distractions is to train the dog to handle the mass confusion of an actual search. Add them only after the dog understands what it is supposed to do. If the dog has a problem at any level, go back to the next lowest level until it is consistently successful. You can coax and lead your dog a bit very early on, but be careful about such help later.

Level Five

Level Five is the real thing. Someone in your backcountry group, or another group you come upon, is caught

in a slide. Like any First Responder, determine if the scene is safe for you to enter and take whatever steps you can to find the victim immediately. Every minute counts. Because lives are at stake during a search - the victim's, yours, and those around you - you should continue to increase your awareness about avalanche hazards, avoidance, and rescue skills at the same time you are training your dog.

If your dog does alert during an actual search, balance your response. On one hand, your dog may be alerting in the area of the victim; don't ignore the alert. On the other hand, it could be wrong. Do not abandon all other search efforts and focus only on what the dog is doing.

How Dogs Find People Under Snow

The advantage of using a dog to find a buried person is that the dog can use its nose to detect the victim's scent. In an avalanche burial, the dog may not pick up the scent directly over the victim. There are three reasons for this.

First, as the scent leaves the victim and rises through the snow pack, it does so in an ever-widening cone, something like the rings that spread from a pebble you drop in a pool of water.

Second, the scent will take the path of least resistance. That means that if there are hard slabs of snow or other dense debris, the scent will go around them as it works toward the surface.

Third, once the scent breaks through the snow, it is at the whim of any breezes, and drafts moving up or down the hillside.

An awareness of these three influences on a scent is very important as you watch your dog's reactions when it plays the Avalanche First Responder Dog game and, more importantly, if you are ever on the scene of an avalanche burial.

Conclusion

Keep in mind that you and your dog are not a fully trained avalanche rescue dog team, even after mastering the game's first four levels. Do not tell people you are. This article provides only the guidelines for a fun game to play with your dog that MIGHT make it an Avalanche First Responder. But also keep in mind that thousands of people and their dogs venture into the backcountry every winter to work and play. On those rare occasions when an avalanche accident occurs, the people and resources on-scene have the best chance to recover someone alive. A family dog that has played the avalanche dog game could help make a life-saving find.



Zahn digging in the snow at the source of the scent as it works up through the snow. Zahn made 11 finds in his career including two avalanche body recoveries in the San Juans. He had to be put to sleep early this spring due to complications related to age. He was 13 years old.

Good company.

Your only chance to survive an avalanche burial is to be rescued by a companion. Who are you touring with?

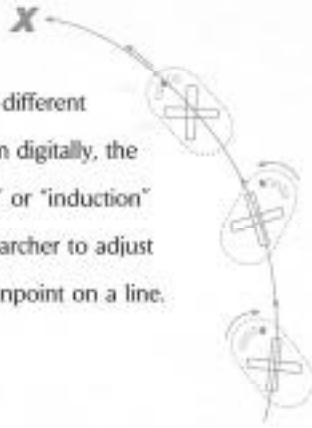


TRACKER DTS

- The world's first digital, dual antenna beacon
- The top-selling beacon in North America
- Eliminates "grid" and "tangent" searching
- Visual distance and direction displays/no volume controls
- Recommended by the Swiss, German, and Austrian alpine clubs

Flux Line Search

By receiving the signal on two different antennas, then comparing them digitally, the Tracker can follow a true "flux" or "induction" line search. This enables the searcher to adjust direction "on the fly" and to pinpoint on a line.



The leader in companion rescue technology.

There's no substitute for experience. Try our equipment for yourself. For a BCA Pro Loan, please call or e-mail us.

Backcountry Access, Inc. • Boulder, CO USA • www.bcaccess.com • 800-670-8735

Organizations using the Tracker DTS: Jackson Hole Ski Patrol • Mt. Baker Ski Patrol • Mammoth Mountain Ski Patrol • Pioneer Mtn. (Yellowstone Club) Ski Patrol • Loveland Basin Ski Patrol • Berthoud Pass Ski Area • Keystone Ski Patrol • Sunlight Ski Patrol • Whistler Heli-Skiing • North Cascades Heli-Skiing • Chugach Powder Guides • Valdez H₂O Heli-Adventures • Points North Heli-Adventures • Out-of-Bounds Adventures • Alaska Mountain Safety Center • Jackson Hole Mountain Guides • Sierra Ski Touring • Sierra Mtn. Center • Summit Huis Assoc. • Colorado Dept. of Transportation • Wyoming Dept. of Transportation • Colorado Division of Parks • Alyeska Pipeline Co. • Yosemite National Park • Yellowstone National Park • Alpine Meadows NSP • Southern California Nordic Ski Patrol • Tahoe Nordic Ski Patrol • Mountain Rescue Aspen • Whistler SAR (BC) • Fernie SAR • Alpine SAR Team (CO) • Garfield County SAR (CO) • Teton County SAR (WY) • Grand County SAR (UT) • Powell County SAR (MT) • 15-90 SAR (MT) • Calaveras County SAR (CA) • North Country Rescue (AK).



Companion Shovel & Probe

- High-strength, oversized, extendable oval shaft
- Aluminum blade with oval, reinforced cross-section
- Flat, low-angle blade surface for cleaner columns
- Reversible offset grip that decreases back strain; when reversed, easier to carry directly on back
- Optional 6-foot Companion Probe can be stored in shaft
- Light and compact

Also available: SR260 2.6-meter search-and-rescue probe



Photo: Larry Prosser



American Avalanche Association
P.O. Box 428
Moab, UT 84532

Non-Profit
Organization
U.S. Postage
PAID
Livingston, MT
Permit #93

PUT LABEL OVER THIS TEXT AND ABOVE THE LINE BELOW