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Fighting the White Death

THE "White Death" claims many victims every year, mainly in spring when most avalanches occur.

There are several kinds of avalanches. Some so-called dry-snow ones can have a front as wide as a kilometre, some can assume incredible speed – 100-300km/h. And the force, too, is tremendous – it can move rocks.

On the old Susten pass road, one finds a boulder nine metres long and four metres high. It bears the inscription: "Natural monument, protected by the State". On February 15 1928, this rock was thrown by the Wanglaui (Wang avalanche) from its original site in the stream to its present position 46m away.

Anyone who has ever been in or near an

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avalanche will never forget the frightening experience. It has been shown that skiers are very often responsible for releasing an avalanche, yet in spite of being aware of the danger, they often ignore it.

For decades, ways and means have been studied to minimise the danger to lives, livestock and buildings, and great progress has indeed been made.

One of the most important organisations in this field is the Swiss Federal Institute for Snow and Avalanche Research on the Weissfluhjoch above Davos, at an altitude of 2,673m.

The mass of visitors carried up there by the Parsennbahn find a number of walks in summer and skiing descents in winter are theirs to select immediately on arrival at the mountain station.

Few only know of the special connecting passage which leads to the Institute. Yet its existence is well known to the public through reports and warnings about avalanches on the radio and other media.

Its activities, though, are not widely known or properly understood.

As the former director of the Institute, Prof. M.de Quervain, said in a book published in 1980, the present structure of the EISLF (Eidgen. Institut für Schnee-und Lawinenforschung) is best explained out of its history.

Snow, ice and avalanches have been of great interest to the Swiss ever since natural

sciences began to be taken seriously, and above all, since the scientific opening up of the Alps in the 18th century.

The first Federal Head Forestry Inspector, J. Coaz, was also the first man who went beyond the purely nature-orientated scientific avalanche research and brought in a practical technical aspect. With his reports, he led the way to preventive avalanche protections (about 1860-1914) and laid the foundation for the activities of the Institute today.

This explains, too, why the EISLF is part of the Federal Office for Forestry (formerly Eidgen. Oberforstinspektorat).

The foundation of the Institute, however, was not the direct result of Coaz's work. For two decades, individual research by forestry officials was carried out in the field of protection against avalanches.

In 1931, the Swiss Snow and Avalanche Research Commission was formed with the aim of getting scientists interested in the problem. This commission engaged in basic studies of snow mechanics, crystallography of the snow and the connection between atmosphere and snow.

They had a snow hut near the Meteorological-Physical Observatory in Davos, but this altitude was insufficient, and the winter not long enough. From the autumn of 1936, they moved higher to the Weissfluhjoch.

The systematic observation of the snow up there continued non-stop. Snow and the formation of avalanches had been tested in every possible condition, and soon there was

a unique wealth of statistical material available – the activities expanded.

Not even the war prevented the realisation of the project of a permanent research station. The avalanche service of the Army also helped, and in 1942 the Institute was built on territory which the Commune of Davos gave the Confederation. A year later, it was manned and officially opened.

The building has since been enlarged several times, and the Army Service was moved onto a civilian basis and made available to tourism and to the mountain dwellers.

Further buildings were erected elsewhere in the region, and other activities, such as research into the formation of hailstones, were added.

There are heat and cold laboratories, electrical and chemical research sections, reproduction rooms, workshops, store rooms, a library, conference rooms, living quarters and administrative offices, not to speak of machinery and apparatus, including a computer – all part of the Institute.

The EISLF has close connections with many Swiss and international organizations (meteorological institutes, universities, alpine sports organisations, forestry and road construction bodies etc).

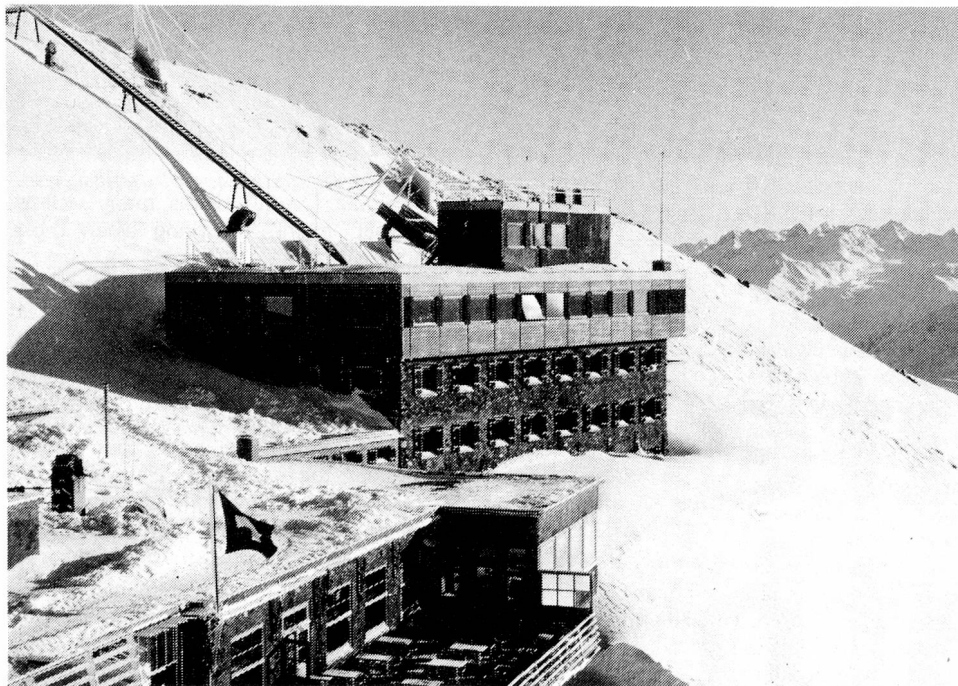
The aims are, as already indicated, the study of snow and avalanches, the physics of it, temperature and atmospheric influences, vegetation and forests. There is the avalanche reporting and warning service, registration of avalanche activities in Switzerland, accident analysis evolving preventative measures and advising the public on protection.

An important aspect of the work is the artificial release of avalanches to prevent more snow from settling and thus reducing the size. This is done by rockets and explosives (mine-throwers, cannons, dynamiting from helicopters).

The construction of various kinds of obstacles is a subject of great interest. New observations are added year by year, and some of the protection methods are veritable feats of engineering. The basic idea is to break the force of the avalanche and to build protective walls, roofs and tunnels for railway tracks and roads, and to erect metal or concrete barriers and steel nets to protect human habitation.

The Institute's experts and special machinery are called in frequently to advise on the best method of protection. Instruction courses for general training and particular ones for tour leaders, alpine first-aid groups, security forces, mountain guides and others are organized by the Institute.

The EISLF in Davos is unique in its wide extent, though there are organisations with the same aims. It is financed by the Con-



The Federal Institute for Snow and Avalanche Research



Avalanche galleries protect the Berne – Loetschberg – Simplon railway.

federation, but specific research is undertaken for private bodies paid for individually.

The EISLF publishes regular reports on snow, avalanches, geological, geotechnical and hydrological essays, expert opinions on glaciology, forestry and many other related matters. Expertise publications for private clients may be available with their permission.

The avalanche situation is checked every morning by 60 observers posted throughout the Swiss Alps. They measure the quantity of new snow, the quality of the crystals, the temperature of the air and in the snow, the direction and speed of the wind. By dialling 120, anyone in Switzerland may obtain the latest snow conditions and avalanche bulletins for the resorts.

Now to the practical aspect as it may concern the skiers.

As soon as an avalanche is reported from anywhere in Switzerland, a team of scientists from the EISLF is mobilised. Rescue teams of the Swiss Ski Association or the Swiss Alpine Club, and if necessary the Swiss Air Rescue Service (REGA) are called up.

Any skier who wants to go off the beaten track should check on weather bulletins and tell people where he intends to go.

He should be well aware of any precautions he can take should he be surprised by an avalanche. There are ways and means of protection even if he should get submerged. And never ignore advice of the local people!

When people and animals are feared or known to have been buried, methods of finding them have become more and more sophisticated. But one of the best is still the specially trained avalanche dog. In 1926, the Army trained the first dogs, and since 1945, regular yearly tests are held for leaders and dogs. Their success is incredibly high.

Electronic instruments are used to find victims, and a revolutionary device has now come on the market – the Recco-Electronic Rescue System.

It was evolved in Sweden, and the final work has been done in co-operation with representatives of the mountain rescue teams of Zermatt and Saas-Fee in Switzerland and avalanche control and rescue personnel from Snowbird, Utah, USA.

In principle, it is a harmonic radar, where the signal is sent from a relatively powerful detection equipment and reflected back to its source by a simple diode with no power source. The total unit (carried on the back) weighs about 12kg.

The reflector is pressed into an adhesive plastic decal attached to the outside of the inner boot of the skier, one on each boot. There is also a model of the reflector which can be attached to trousers.

The detection equipment can be used by foot, skis or from a helicopter, also in conjunction with dog rescue teams.

The results of various tests made with this new device are most encouraging, as victims can be found very quickly and accurately.

Progress has been made on all fronts thanks to science and technical know-how. But the forces of nature remain incalculable, and man will always be adventurous. All too often he will skirt danger and, in spite of the most sophisticated rescue methods, the "White Death" will be his fate.

Mariann Meier

Photographs by courtesy of SNT0