Avalanches in the Sibillini Mounts (Marche, Italy)

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ABSTRACT: Generally we are capacities to think that the avalanche is an event that happens in high mountains or inhabited centers near alpine zones in concomitance of exceptional snow falls. Hard work to believe that also the Appennine zones, in particular the Sibillini Mounts can be interested from destructive and sometimes tragic events. Animated from the great passion for going in mountain and for the study of the snow and avalanches we present a chronological history with also technical considerations on avalanches of the Sibillini Mounts of which news is had. The scope of this job is to show that also little ones mountain groups reserve surprises such to make to remain astonished also mountain people accustomed to see most very wide scenes. Since many of catastrophic avalanches have interested ways of communication and inhabited centers and also ski resorts, we hope that this communication is taken like an invitation to take the due countermeasures regarding these events from the local administrators and managers. We have developed four sections:

- (1) Catastrophic avalanches on inhabited centers and roads;
- (2) Spontaneous avalanches that interest alpine and ski touring routes;
- (3) Avalanches provoked from visitors;
- (4) Avalanches on ski resorts.

KEYWORDS: Sibillini, avalanche, inhabited centers, ski touring, road, ski resort

1 CATASTROPHIC AVALANCHES ON INHABITED CENTERS AND ROADS

The first historical notes of avalanches in the Sibillini Mounts come from 1160 AD, besides the Annals of Ussita give a notice of an avalanche in the year 1516 AD that dropping down from Croce di Monte Rotondo destroyed the small fraction of Vallestretta killing 8 people. Other news come from the year 1604 AD when the inhabitants of Ussita valley sent a letter to Pope Clemente VIII about the avalanche of the year 1516 AD: *"L'anno 1516 venne una lama de neve et ve annegó et sommerse a terra 9 case et ce morse 8 persone et fece molti altri danni…"*. During the 20's and 30's of the last century the NE face of Monte Vettore has been interested from catastrophic avalanches that hit the Montegallo fractions, in particular the 13th of February 1929 an avalanche from the Fosso di Colleluce comes to Mulino di Interprete killing two people, the 4th of February 1934 an avalanche starts from the Fosso di Casale destroying Casale di Montegallo and killing eight persons the ruins of the village are known as Casale Vecchio (Old) and the fraction is rebuilt in a sure zone with the name of Casale Nuovo (New). The W face of Monte Vettore, that is known as relatively sure, is interested in the February of 1934 from an avalanche that destroys the Rifugio Cicchetti built up from the CAI of Aquila below the E face of the Pizzo del Diavolo in a zone considered free from objective dangers. From Punta di Prato Pulito the 21th of February 1929 starts a big avalanche reaching the actual road without causing damage. From Monte Zampa the 3rd of February 1934 starts an avalanche that destroys the small fraction of Rubbiano causing 11 deaths. The 16th of March 1970 Monte Zampa is interested from a second avalanching event that reach Isola S. Biagio. The S face of Monte Sibilla is interested from several avalanches during the past winters, coming also to interest the road for Foce (December 1990 (Fig. 1), January 2005). During the winter 2005 the village of Rubbiano is evacuated the 29th of January and the road is closed for the elevated danger of avalanches (degree 4 over 5). Also the road (SP 477) from Visso to Castelluccio di Norcia is interested from avalanches that born from Monte Rotondo, the 22th of January 1981 an avalanche destroys the forest and reach the road, the same site is

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interested by a new event between the 24th and the 25th of March 2005.

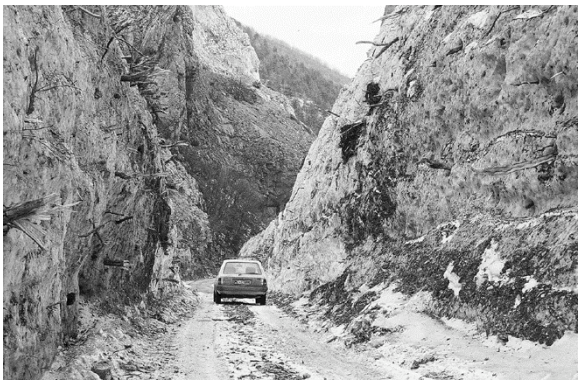

Figure 1. The road for Foce invaded by the avalanche of December 1990. The picture was done at the beginning of the summer 1990.

During the winter 2004/2005 the exceptional snowfalls of end January have created a dangerous situation for Vallestretta di Ussita, with danger in the bulletin of the Corpo Forestale dello Stato at level 4, constraining the 1st of February to operate an artificial detachment using 15 explosive balls having a mixture H_2-O_2 launched from an helicopter. In the same period (01/29/05) a slab-avalanche starts from the zone between Fematre and Riofreddo arriving on the road with a forehead of 200 m and a thickness in the accumulate zone of 2.5 m. The zone Monte Rotondo – Val di Panico is interested from catastrophic avalanches like that ones of the 7th of December 1927 when an avalanche starting from Croce di Monte Rotondo destroys thousands of m^2 of forest, these events replicate the 30th of November 1980 and the 14th of December 1990 destroying a big amount of forest (Fig. 2).



Figure 2. The SW sector of Croce di Monte Rotondo above Vallestretta di Ussita. Near the left upper corner the defensive facilities.

Another event to remember is that one of March 1973 when an avalanche starts from the SW face of Monte Rotondo and drops down to east respect to the village of Casali, in the same period an exceptional avalanche starts from the W face of Pizzo Tre Vescovi and reach the sources of Panico, event that replies during December 2002. In the area of Banditella (Fig. 3) near Macereto the 2nd of April 2005 are acquired the dimensions of an avalanche (thickness of 4.5 m in the detachment zone, sliding zone 180 – 200 m) that was seen to be detached the preceding Sunday.

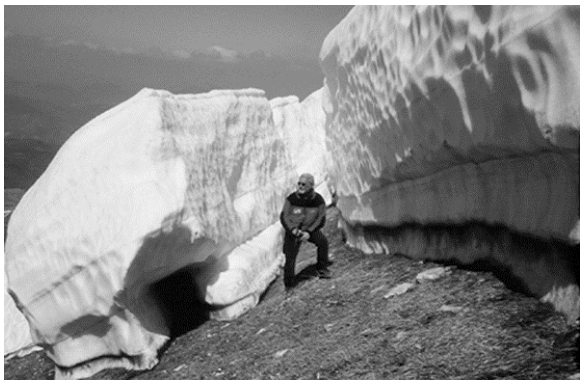

Figure 3. Thickness of the avalanche of Banditella in the detachment zone.

Another event to remember that destroyed a forest for a vertical extension of 300 m is that of the 10th of March 1973 with an avalanche that detached from the NW face of Monte CastelManardo and fell on Ripe di Bolognola. The small fractions of Bolognola (Fig. 4) have been hit many times by catastrophic avalanches, being detached from the above Monte Sassotetto (1624 m), in 1823 the buildings are destroyed and there are three deaths, very more tragic were the avalanches of the 11th of February 1930 and of the 3rd of February 1934 that fell down on Villa di Mezzo and on Villa da Piedi and di Mezzo causing in total 38 deaths.



Figure 4. Bolognola destroyed by the avalanches of February 1930 and 1934.

Also the same road that relies Bolognola to Sarnano in the Pizzo Meta zone is subject to important and frequent avalanching events only during February 2005 four avalanches (February 2, 13, 14, 21) interrupted the normal circulation in several points. These events are originated by the contemporary presence of several factor: exceptional snowfalls with a strong windy activity, temperature raising up caused by the wind rotation from NE (bora, cold wind from the Balkans) to SW (libeccio, falling hot wind, similar to the alpine föhn), however there is also an anthropic cause that increases a lot these events being represented by the lowering of the upper forest board of about 200 m, generally from 1800 to 1600 m, to produce zone adapt to pasture.

2 SPONTANEOUS AVALANCHES THAT INTEREST ALPINE AND SKI TOURING TOURS

It is extremely important for our security to know if the planned tour is regularly interested by avalanches. Several alpine and ski-alpine tours of Sibillini Mounts are affected by this problem. We should never forget that sometimes the danger could come from a zone placed many hundreds of meters above our trace. This is the case for the Pisciarelle zone (Fig. 5), at the enter of the throat of Infernaccio, where from the N face of Monte Sibilla, during all the winter season, fall down big amount of snow that close the accessibility to the throat, the 3rd of March 1979 an avalanche falls on the Pisciarelle zone killing two fishermen that were on place.



Figure 5. Falling of a dusty avalanche at the enter of the throat of Infernaccio.

The road Pintura di Bolognola – Fargno suffers the same problem, being closed from November to June is often used for short tours, it is entirely dominated by the NW face of Monte CastelManardo known to be avalanching, an avalanche of March 1973 involved three persons, they did not suffered injuries, that were in this zone during an official tour of the Ski-touring course of the C.A.I Macerata. Always in the same zone we have note of an avalanche that was detached from Forcella Bassete toward the Pescoletta the 29th of December 1988 involving a man, that fortunately did not suffered injuries. Another site to remember is Monte Amandola that having particular topographic characteristics (slope > 30°, ENE exposure) is particularly interested by the detachment of spontaneous avalanches. We have note of an avalanche of the 29th of March 1987 that involved the responders of CNSAS Ascoli during a training session. The Monte Bove zone is extremely interesting from a winter mountaineering point of view having several couloirs that during the winter are extremely fascinating mixed climbing tours. The major danger in these couloirs is represented by the fall of the frames (Fig. 6), that also during winters with low snow falls reach big dimensions due to wind effects, forming at the exit of the same couloirs.



Figure 6. Frames on S Bove (2169 m).

Two events involved mountaineers, the first one the 26th of December 1997 happened in Valle Romana, couloir with slope of 80% and northern exposure, when a group of mountaineers was hit by an avalanche caused by the fall of the upper frame. The second event happened the 29th of January 2001 in the couloirs of South Monte Bove where two mountaineers are hit by the falling frame. All the people involved in these two events did not suffered injuries and were rescued by CNSAS and CFS. About these avalanche we have the following considerations: they happen in steep slope (> 30°) or extremely steep (> 45°), the exposure of the faces is generally on the northern sector, big amount of snow accumulated by wind, fast rises of temperatures.

3 AVALANCHES PROVOKED FROM VISITORS

This type of avalanche is of interest for all users of every discipline of winter mountain: ski-touring, winter mountaineering, ice climbing, freeride, snowboard, snowshoes, being the triggers of the event. Obviously to limit the objective dangers every person should never forget all the aspects of security and prevention when we are going in mountain. Most of the events were verified:

- on open and uniform faces with slopes > 30°, where the terrain had an uneven topography, the presence of small hills and depressions rises the number of tension zone inside the structure of the snowy mantle, where the terrain had *falasco* (it is a cumulus of blades of grass with length between 20 and 30 cm that represents an optimal sliding surface);
- in the northern sector, that being more cooler has the possibility to retain the potential danger for a period of time longer respect to the southern sector, building metamorphism versus destroying ones;
- after a snowfall, the first 48-72 h from the end of the snowfall are the most dangerous;
- on the snow accumulated by wind effects, not having intermediate shields between the Sibillini and the Adriatic Sea the winds sometimes can be very strong;
- for the fast thermal rises caused by falling winds from SW and for the not excessive eight of the mountain range.

The first event of which we have a written relation happens the 1st of May 1963 during the ski-touring race Trofeo Monte Bove, when three participants (Formica M., Brunelli C., Bartoli R., whose did a relation of the event) are dragged by a snow slab, without injuries, from S Bove to inside the valley of Bove. Always in the zone of Bove, in this case on the Passo Cattivo road, the 28th of December 1976 Gino Miconi and Nazzareno Moroni cause the detachment of a snow slab and are dragged inside the valley for about 50 m stopping near a small forest, also in this case the two man did not suffer injures and have given a relation of the event.

On the W face of Monte Vettore P. R. the 24th of February 1985 in the “Roccette” zone (Fig. 7) causes the detachment of a snow slab without reporting injuries. In March 1989 Brunelli C. e Romagnoli F. during a ski tour cut the higher section of Selvapiana’s channel causing the fall of a wet snowy mass, the protagonist report to have heard a roar some moment before the detachment. Also experienced person have been involved in these events, we should remember the fatal accident occurred to Giancarlo Grassi the 1st of April 1991, who after the climb of an icefall in Panico Valley cutting diagonally the steep slope of escape causes the detachment of a snowy slab that drag him to the base of the icefall. In February 1993 Pistonesi causes the detachment, without reporting injuries, of a snowy slab skiing down from Monte Priora. The 20th of January 2002 P. R. going up with ski in the northern coluoir of Pizzo Berro (Fig. 8) causes the detachment of a snowy slab in proximity of a slope change.



Figure 7. The “Roccette” in the Pilato Valley. Note the avalanche below the rocky layer.



Figure 8. The slab detached in the N coluoir of Pizzo Berro.

4 AVALANCHES ON SKI RESORTS

Extremely important is not to underrate the danger represented by avalanche detachment from faces above or near the ski resorts. If the ski resort facilities give us an help for going in mountain, it never needs to forget that a snowy face having the characteristics said in the previous paragraphs may be potentially dangerous if it is in the heart of the wildest mountain or if it is few meter far away from the skilift or in a tamed and/or civilized mountain zone. In the ski resort of Ussita-Frontignano we should be extremely care in descending by ski or snowboard the channel of Selvapiana as witnessed by the avalanche of the 26th of

December 2002 of which Claudio Busco did the photography (Fig. 9).



Figure 9. The avalanche of December 2002 in the channel of Selvapiana (Ussita-Frontignano).

The Bolognola ski resort has been protagonist of avalanching events the 11th and the 18th of March 2005, near the skilifts as shown by the pictures of Giuliano Mainini (Fig. 10-11).



Figure 10. Avalanche in the ski resort of Bolognola (March 2005).



Figure 11. Avalanche in the ski resort of Bolognola (March 2005).

The Sarnano-Sassotetto ski resort seems to be the more hit by these events that happen cyclical during the years. The night between the 31th of March and the 1st of April 2001 an avalanche (Figs. 12, 13) has interested directly the ski resort and the same site has been object of many avalanches during the winter 2005, as testified by the reports and by the pictures (Fig. 14) done by us (events of the 10th, 11th, 17th of February, 12th of March 2005), in a case (19th of March 2005) we have seen live the detachment of a big mass of snow that invaded a zone of the ski resort, not involving people because the resort was still closed.



Figure 12. Ski resort of Sarnano-Sassotetto, avalanche of the 1st of April 2001.



Figure 13. Thickness of the avalanche of figure 12 in the detachment zone.



Figure 14. Ski resort of Sarnano-Sassotetto, one of the avalanche during the winter 2005.