

The crossing of the Alps of Gerbert of Aurillac during the 984 AD: climatic implications

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Riassunto

Una lettera di Gerberto di Aurillac al vescovo di Girona Mirò Bonfill scritta nel 984 dC pone un'interessante questione di climatologia storica. L'utilità di tale fonte è qui discussa nel contesto più generale delle fonti documentali relative agli attraversamenti delle Alpi. Il principale elemento di interesse della lettera risiede nella coscienza di un ridotto rischio climatico connesso all'attraversamento fra fine autunno e inizio inverno del passo del Gran San Bernardo, il che depone a favore della mitezza del periodo medioevale.

Introduction

In a letter to Miró Bonfill (Bishop of Girona) sent in march-april 984, Gerbert d'Aurillac wrote that "if you want to write something to us, please address your correspondence to Reims until the first of November or to Rome from December 25". This envisages a journey from Reims to Rome in the period 1th November - 25 December (Sigismondi, 2009).

In those times the road normally used to reach Rome from Reims was the Via Francigena which crosses the Alps at the Great St Bernard pass. This pass is a privileged transit point through the Alps since ancient times as stated by the old name "Col de Mons Joux" that remembers the Jupiter's Pennino temple built along the old Roman road. The crossing point is at 2437 m asl, which from autumn to spring gives a significant risk of crossing failures due to snowfalls.

The trip of Gerbert of Aurillac leads us to the general topic of the documentary sources of the crossings of the Alpine passes. These sources are in great number and the oldest ones are probably referred to the crossing of the Alps by Hannibal and

his army in the fall of 218 BC, described by Silenus, Polybius, Varro and Livy while alpine passes are crossed by man since prehistoric times (Kean et al., 2013; Fedele, 1999).

Climate variability after the last ice age

Indisputably the periodic climate changes of the Holocene strongly affected the Alpine region, starting with the very hot phase from 8500 to 5000 BP (the Holocene Climatic Optimum) during which the Alps were almost completely free of glaciers. After the end of this long hot period, a gradual deterioration of the climate took place and culminated with the Little Ice Age (1250-1850 AD) (Marcott et al., 2013). Such deterioration was, however, interrupted by warm phases named the Mycenaean optimum (3300-2850 BP), the Roman Optimum (2300 BP - 1600 BP), the medieval optimum (1100 BP – 700 BP or 900-1300 AD, including Gerbert's life) and the current warm phase (after 1850 AD). The relevance of these warm phases is extensively documented by the studies on the position of fronts of the alpine glaciers. For instance Hormes et al. (2001) stated that in the Central Alps the glaciers would have been more backward than today for eight times after the end of the last ice age. Furthermore Goehring et al. (2011), by applying to exposed rock a dating method based on ^{14}C / ^{10}Be stated that the Rhone Glacier after the end of the last ice age was less extended than today for 6500 +/- 2000 years and more extended for 4500 +/- 2000 years.

Air circulation and snowfall

These findings can be rightly interpreted only in the light of the strong variability that affects the alpine meteorology. More specifically the advection of polar maritime, polar continental and arctic air masses from relatively close source regions gives

a significant risk of snowfall even at relatively low altitudes (1500-2000 m) from autumn to spring, making not passable the Alpine passes. Vice-versa the long persistence of anticyclonic conditions can give high passes free of snow also during winter. This meteorological variability should be approached in terms of risk and risk perception. So we can state that (i) the risk of failure of the Alps crossings is higher in cold climatic phases and (ii) the risk perception by people that cross the Alps is strongly influenced by the state of roads, means of transport, clothing and so on, much less suitable in the past than today.

Conclusions

In conclusion, the risk perception detectable from written sources and the success rates are the main information that can be obtained from the documentary sources of crossings of the Alps carried out in different epochs. By this point of view the trust of Gerbert of Aurillac in the respect of the predefined travel time testifies a low perception of the risk of the transit of the Great St Bernard. This reinforces the evidence of an unusual mildness of Medieval period in Europe coming from many other documentary sources.

References

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Fig. 1 Path Rome-Canterbury described by Sigeric, after receiving the pallium of archbishop in Rome in 990 AD. The step LXX of this journey is Reims (Ortemberg, 1990).