Geophysical Research Abstracts,
Vol. 11, EGU2009-8887, 2009
EGU General Assembly 2009

A review of the discovery of the Laschamp excursion in the Chaîne des Puys by Norbert Bonhommet

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During the early 60s, Norbert Bonhommet extensively sampled in the Chaîne des Puys, France (>150 sites, 50 volcanic units) for his Doctorat d'Etat at the Institut de Physique du Globe de Strasbourg. Much of the volcanism is Brunhes-age and as young as the Holocene. Bonhommet and Babkine (1967) discovered reversed paleomagnetic directions in the Olby and Laschamp flows. First dated between 20 and 8 ka BP (Bonhommet and Zahringer, 1969), for a time the Laschamp had a place on magnetic polarity time scales (e.g., Cox, 1969) as the most recent reversal of the Earth's magnetic field. Bonhommet (1972) reported also intermediate directions at several localities and especially at Royat and Louchadière. Early investigations of some magnetic and mineralogical properties of the Laschamp and Olby flows indicated that the magnetizations of the Laschamp and Olby flows faithfully record the direction of the ambient magnetic field in which they cooled (Whitney et al., 1971). However, Heller (1980) and Heller and Petersen (1982) reported experiments on self-reversal of natural remanent magnetisation in the Olby-Laschamp lavas casting doubt on the reality of a true geomagnetic event. This interpretation led Bonhommet to further study the Laschamp and Olby flows though he was at that time mainly working in paleomagnetism applied to geodynamic studies. In 1981, the Laschamp and Olby flows were sampled again in great details (91 samples). Very low paleointensities were found at Laschamp and Olby (7.7 ± 1.6 μT; Roperch et al., 1988) and Louchadière (12.9 ±3.3 μT; Chauvin et al., 1991) indicating that the Laschamp ought to be considered a geomagnetic excursion. Recent investigations of the self-reversal properties of some samples of the Olby flow (Krasa et al.,2005, Plenier et al., 2007) reached the same conclusion as previously proposed by Roperch et al. (1988) that the stable magnetization with high unblocking temperatures corresponds to a reliable record of the geomagnetic field at the time of cooling of the Olby flow. Improvement in radiometric dating and especially in 40Ar/39Ar did confirm the young ages of the Laschamp excursion (Chauvin et al., 1991, Guillou et al., 2004, Plenier et al., 2007).