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Letters to the Editor

Comments on: Postulated Rotation of Corsica not Confirmed by New Palaeomagnetic Data

by K.M. Storetvedt and N. Petersen
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Storetvedt and Petersen (1976) hold that the primary magnetization of Permian lavas and intrusives from Corsica was destroyed and that a complex chemical magnetization took place in the Tertiary. We would like the reader to be aware of a few facts and make some remarks.

1. The Geology of the Region

We know much better now the structure of Monte Cinto volcanics (Vellutini, 1973). Two different volcanic stages can be seen. The first one, calc-alkaline, (late Carboniferous, Early Permian) gave andesites (Osani) and ignimbrites (Fango valley). The second one, peralkaline (Upper Permian) gave ignimbrites, lavas, rhyolitic domes, dikes, organized in ring complexes (Cinto, Scandola, Porto and more south: Tolla-Cauro). The dikes seen on the road and studied by the authors took place at the end of this second stage. To the contrary of what they say, the Mesozoic and Cainozoic cover of Western Corsica is rather thin. For example, the Trias has a thickness of about 20 m (quartzites, dolomites and calcareous rocks) (Durand Delga, 1972). As Sardinia and Provence, Western Corsica *does not belong to the Tethyan geosyncline.* It is only its foreland. The Permian volcanics were subjected to surface conditions during Permian and post-Permian times. The volcanism was not continuous, lahars interbedded with ignimbrites are known and show that there was time enough for tectonic movements to take place between eruptions.

A geochronological study by $^{39}A/^{40}A$ and step heating does not show any evidence of post Permian reheating (Maluski and Lancelot, 1976). Moreover we do not know any Tertiary metamorphism in this region.

2. Magnetic Mineralogy

It is true that the dykes contain Fe and Ti hydroxides. They are dehydrated during heating and other reactions may take place after. Curie curves are then difficult to interpret. The maghaemite/haematite transformation would lower *Js* but not the Curie point (p. 62, line 5). The authors seem to forget than this form of volcanism (mainly ignimbrites and pyroclasts) is due to the occurrence of a lot of gases which may be the reason for the observed transformations. Most dikes show also successive injections which may bring the necessary fluids. Nevertheless we would like to know the reactions and conditions that can give perovskite and sphene from titanomagnetites.

3. Rock Magnetism

A large number of samples and mostly those from the dikes show an important viscous remanent magnetization (V.R.M.). This V.R.M. can reappear during A.C. or thermal demagnetization process as spurious components. Storetvedt and Petersen rejected samples where intensities behave irregularly, but it is not enough. Spurious components may be added during high temperature demagnetization and be seen only in direction. The authors interpret such results without checking the relative importance of an artificial T.R.M. (It may be much larger than the N.R.M.). In other palaeomagnetic laboratories, demagnetization curves showing a change in direction at high temperature would be suspected as spurious components.

We do not see much evidence of the "strong normal demagnetization" or do they consider the direction of CO 50 ($D=350°$, $I=-60°$) as a normal one?

Storetvedt and Petersen say that composite magnetization may exhibit high directional stability (p. 66, line 8). It may also be the case for the few samples they kept.

The measurements published in 1968 by Nairn and Westphal show that the dikes have a large scatter of their magnetization directions, the declination varying from SSW to SE. No tectonic corrections could be made on these rocks, thus the results have to be taken with care. Storetvedt and Petersen retain only a small part of these directions.

Other formations (rhyolitic flows from Senino) and new measurements on Fango ignimbrites (Westphal et al., 1976) show stable magnetizations with stable end points and a low within site scatter. These directions span from S to SE. Tectonic corrections could be applied on these formations.

We are afraid Storetvedt and Petersen chose the worst rocks with the highest viscous magnetization for their interpretation.

4. Interpretation

Storetvedt and Petersen compare their results with those obtained by a similar manner on Lisbon volcanics. Against all geological and geophysical evidence

Storetvedt stated that the rotation of Iberia was post Oligocene. We must recall that Storetvedt's interpretation has been strongly criticized (Watkins and Richardson, 1971).

5. At last, both in Portugal and in Corsica, Storetvedt rejected more than 90% of his measurements and kept the few ones that allowed him to contradict systematically previous authors.

To conclude, we feel that we have no evidence that the modification of magnetic minerals took place more in the Tertiary than just after the eruptions.

(a) the rocks were subjected to surface conditions and were not buried deep.

(b) the so called "strong normal magnetization" may be only spurious magnetizations.

(c) Iberia having turned before Oligocene, this comparison made is not valid.

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