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Known paleomagnetic data from Sardinian rocks of Late Oligocene/
 Early Miocene age suggest that a counterclockwise rotation of Sardinia
 could have occurred during the Late Tertiary.

In the area of Castelsardo, in Northern Sardinia, a number of stratigraphic units outcrop, which are suitable for paleomagnetic study. Two main andesitic bodies, not older than Middle Oligocene underlie all other units; the andesites are followed by a thick sequence of tuffs, tuffites (Mlt of the Geological Survey map) and sediments of fresh water to brackish environment, dated as Langhian on the basis of their fossil content. Within the sequence flows of rhyolites (Mlt of the Geological Survey map) are intercalated; at the top lies a thick ignimbritic flow (τ_2) of large areal extent. Near Castelsardo the flow is overlain by transgressive Serravallian ("Helvetian" auct.)

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sediments. Therefore the stratigraphic position of the volcanic units is well established in the Castelsardo area.

The Natural Remanent Magnetizations of 95 hand samples from 21 sites have been studied at the paleomagnetic laboratory of the State University of Utrecht. The intensities of magnetizations were of the order of 200×10^{-6} to $9,000 \times 10^{-6}$ emu/cm³; the Q values vary between 0,4 and 30, but are generally higher than 1,0. Stepwise demagnetization in alternating fields of up to 3,000 Oe generally revealed that secondary magnetizations play no important role and that they can be easily removed in the lower alternating fields. The "within-sites" scatter of the direction of characteristic magnetization was small and further decreased upon demagnetization. The summary of results (bottom to top) is as follows:
 Andesite body of Contralta near Castelsardo (3 sites, 11 samples): $D = 320^\circ$; $I = -59^\circ$; $\alpha_{95} = 15^\circ$; $K = 65$. Andesite body south of Castelsardo (Nulvi and Tergu) (4 sites, 17 samples): $D = 323,5^\circ$; $I = + 11^\circ$; $\alpha_{95} = 7^\circ$; $K = 181$. Rhyolitic flows of Langhian age near Castelsardo (Mlt τ_1) (7 sites, 32 samples): $D = 298,5^\circ$; $I = +62^\circ$; $\alpha_{95} = 9^\circ$; $K = 48$. Langhian tuffites of Castelsardo (Mlt) (2 sites, 10 samples): $D = 329^\circ$; $I = 68,5^\circ$; $\alpha_{95} = 22^\circ$; $K = 129$. Ignimbritic flow at Castelsardo (τ_2) (5 sites, 25 samples): $D = 1^\circ$; $I = 53,5^\circ$; $\alpha_{95} = 7^\circ$; $K = 117$. The results are given after demagnetization (500 - 3,000 Oe) and correction for dip of the beds.

A large variability of both inclination and declination was found; within the change of declinations, however, a consistent trend can be shown: the oldest rocks possess the most westerly declination, younger rocks a NNW declination and the most recent rocks (the thick ignimbritic flow) show declinations close to the North. By comparison with other works also, the other most recent formations from Sardinia (basalts near Logudoro, Bobier et Coulon 1970, basalts near Orosei, from Campidano and from Campeda, Manzoni et al. 1972) have directions close to the present field, while other pre-Serravallian (pre "Helvetian" auct.) volcanics possess westerly declinations (De Jong et al. 1969, Bobier et Coulon 1970).

Such change of declinations can well represent a counterclockwise rotation of Sardinia over an angle of about 50° . As the direction of the tuffites are intermediate, this fact could suggest that the rotation actually took place during the deposition of the Langhian sequence of Castelsardo and was completed by the Middle Miocene, although this is at variance with the hypothesis (Alvarez 1972) of a rotation not completed until the Pliocène.

Interventions à la suite de la note de Jong et al. (4-4.) :

RYAN - I could speak on behalf of my friend Alvarez who was in Sardinia this summer. He is completely in accord with your interpretation of Middle Miocene rotation.

SOFFEL - After paleomagnetic studies, Italy itself would have rotated around 15° between Eocene and Middle Miocene. So it be said that the rotation of both blocks was contemporary.