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Potassium-Argon Ages from the Ceneri Zone of Southern Switzerland

(A Summary)

By *Fred W. McDowell* (Zürich)*)

Twenty three potassium-argon ages have been obtained for micas and hornblendes from the gneisses and amphibolites of the Ceneri zone (REINHARD, 1963) as the first part of an isotopic dating project in the region. Fourteen of the ages form a tight cluster around 315 m.y., including both mica and hornblende results. Agreement between ages of cogenetic micas and hornblendes is found only within this group. These data indicate a strong disturbance of the Ceneri zone basement 315 m.y. ago.

Two hornblendes give ages of 346 and 390 m.y. significantly higher than the group mentioned above. In these cases argon was not completely released from the minerals during the 315 m.y. disturbance, and thus they retain a partial memory of some older age. It is clear that 315 m.y. is *not* the time of the amphibolite facies metamorphism recorded in the basement of the Ceneri zone. This metamorphism must have occurred earlier, and the 390 m.y. age represents a *minimum* estimate of the time of the metamorphism. An estimate of 420—440 m.y. for this metamorphism has recently been obtained by PIDGEON et al. (1968) using U-Pb ages of zircons.

The seven younger ages may be due to more than one cause. Those older than about 280 m.y. are probably the result of variations in the strength or duration of the 315 m.y. disturbance within the region. However, the four mica ages in the range 190—250 m.y. must be due to a later disturbance. Since these ages have a large spread it is only possible to say that this later disturbance occurred sometime within the past 190 m.y. It is of considerable importance that these ages all occur west of a line running approximately south-south west from the Ceneri pass through Monte Tamaro and Monte Lema, and that no older mica ages have been found thus far west of this line.

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These younger ages appear as one moves toward the Ivrea-Verbano zone and it is very possible that they are due to the same effect that has produced ages in the range 170—180 m.y. within the Ivrea zone itself (GRAESER and HUNZIKER; McDOWELL and SCHMID). This possibility is currently being studied with additional age determinations in the western portion of the Ceneri zone. A more detailed paper on this work is planned after these further results have been obtained.

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SMPM = Schweiz. Mineral. u. Petrogr. Mitteilungen

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