Paleoweathering in the Hocheifel volcanic field

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The central part of the Hocheifel region is deeply eroded. The amount of erosion has been deduced from the state of preservation of the Eocene/Oligocene volcanic edifices and the remains of the post-Eocene/Oligocene erosion phase, *e.g*. grey plastosols, altered Devonian rocks and/or altered Tertiary volcanics. So, in the central part of the Hocheifel volcanic field, there are no remains of lava flows, scoria cones, maar volcanoes and primary tephra deposits, in contrast to the Tertiary volcanic field of the Westerwald on the right-side of the Rhine river. Close to the northern and southern margins of the Hocheifel volcanic field, in areas of lower elevations, the landscape was not so strongly affected by such an intensive erosion. Here, relics of primary volcanic craters and primary tuff beds exist, *e.g*. the Eocene Eckfeld maar volcano in the south and Tertiary clay deposits in the north.

The intensive erosion was controlled by uplift and weathering processes, probably before the beginning of the volcanic activity of the Hocheifel (48 Ma) and continued during the time of volcanic acitivity during the Oligocene and lasted probably until Miocene times. Starting in Pleistocene times, about 800 000 years ago, until today there has been a younger phase of uplift relative to the surrounding areas of up to 200 m (Meyer & Stets, 1998). This uplift value was inferred from the elevation of the main terraces, which were preserved in river valleys, which reach from the Mosel into the area of the Hocheifel.

The center of the Tertiary uplift was located near Kelberg, where an almost perfectly circular magnetic anomaly of about 260 nT and a diameter of about 20 km was discovered. The origin of this anomaly and the Tertiary uplift were interpreted by Büchel (1991, 1993) as an effect resulting from a Tertiary magma chamber. The center of the uplift is evident even today in the rivers radially running outwards from the center. Here, strongly eroded small und large diatremes of up to more than 600 m in diameter are found. From the form of the diatremes and the composition of the diatreme fillings we estimate that the erosion of the former upper part comprised several hundred meters, probably even up to 600 m in the area of Kelberg.

It is impossible to say at what time how much was eroded. The relatively young uplift of about 200 m resulted in the further erosion of a great amount of Tertiary volcanics. We assume that this youngest uplift is related to the Eifel plume, which was located in the south, in the adjacent area of the Westeifel volcanic field.

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