

## ***Interactive comment on “Isovolumetric replacement and aeolian deposition contributed to Terrae calcis genesis in Franconia (central Germany)” by Bernhard Lucke et al.***

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Dear editor, reviewer 2,

thank you for your efforts invested in our study. We found review #2 quite irritating, especially since the reviewer felt obliged to descend to a language level close to the sphere of personal insults. Unfortunately, when this sphere is reached, one often maneuvers in the realm of battles of faiths and we feel it is not advisable to waste time on this.

To keep it short, we do not agree with this review. It demands extensive data on clay

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mineralogy from X-ray diffraction and on the geochemistries of rock and soil, which are however not suited to understand features of the very thin rock-soil transition zone. It is impossible to carry out bulk soil analyses of such small areas. In addition, such bulk analyses are based on outdated concepts, methods, and models of *Terrae calcis* research. There is no point of conducting a comparison of the clay mineral assemblages of soil and bedrock residue any more, since it has been shown that e.g. illite neoformation during pedogenesis is possible (see e.g. Sandler et al. 2015, possibly due to a catalyzing role of plants). Similarly, there are serious doubts whether it is possible to conduct a comparison of the geochemistry of clays with the bedrock (residue) since even weak acids might induce considerably stronger leaching (including various rare elements) than previously assumed. That such comparisons were conducted extensively in the past does not help, and it is not useful to cite all these studies. In this context, one could certainly have studied the current composition of the soil solutes, but this would not help to address the potential role of plant roots, or the question whether replacement features are relict.

The only way to investigate the geochemistry and structure of the thin rock-soil transition zone are "static" chemical data at the nanometer scale as in our study, since even classical petrography with optical microscopes is not suited for this scale. However, it should be pointed out again that the reported features could be observed only in the rock-soil transition zone, and not in the soil matrix or the rocks. This restriction to the transition zone unfortunately seems to have escaped notice of reviewer #2. In this context, we find it disappointing that the observed features were not discussed in the review, but flatly discarded as "just a few observations with EDS on some thin sections". It should be pointed out that they could be observed in practically all thin sections of the (more numerous) rock-soil transition zones that we studied, so they are a quite common phenomenon, but one has to limit the number of examples in a publication. Unfortunately, the reviewer does not dare to explain why spatial observations at nanoscale should be so completely useless. We could imagine sedimentary features of the primary limestone as alternative explanation, and it would have been helpful if

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respective sources with similar observations would have been provided. Yet the question would remain why no such features could not be detected in the limestones of our profiles, but only in the narrow rock-soil transition zones.

Although it is difficult to imagine phyllosilicate or Al-mobility in a limestone system, we do not consider it good scientific practice to disregard the growing literature on replacement as "a lot of completely irrelevant studies". We have the impression that reviewer #2 was either not willing or not competent to provide a balanced evaluation of our observations. Whether finally ending in the soil discussion forum or a soil paper, this public review has at least the advantage that our observations and their (rather close-minded) reception are now publicly available and not suppressed. Disappointingly, we feel that nanoscales studies of potential replacement features are not welcome to reviewer #2, perhaps because they could place question marks behind the conclusions of various of the above mentioned earlier studies.

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