



Characterization of fieldstone for a provenance study of local building stones and artifacts

M. Goossens (1), T. De Kock (1,6), J. Dewanckele (1,6), M. Boone (1,6), W. De Boever (1,6), L. Brabant (2,6), S. Louwye (3), M. De Ceukelaire (4), F. Vanhaecke (5), V. Cnudde (1,6)

(1) Research Group Sedimentary Geology and Engineering Geology, Department of Geology and Soil Science, Faculty of Sciences, Ghent University, Belgium, (2) Department of Subatomic and Radiation Physics, Faculty of Sciences, Ghent University, Belgium, (3) Research Unit Paleontology, Department of Geology and Soil Science, Faculty of Sciences, Ghent University, Belgium, (4) Belgian Geological Survey, Royal Belgian Institute for Natural Sciences, Brussels, Belgium, (5) Research Group Analytical Chemistry, Faculty of Sciences, Ghent University, Belgium, (6) Centre for X-ray Tomography (UGCT), Ghent University, Belgium

Fieldstone is a Belgian silicified sandstone speckled with glauconite. The hardness varies with the degree of silicification and its colour, which is usually greenish, can differ from bluish gray to orange depending on the degree of oxidation of the glauconite. Although recently discovered in the clayey interlayers, fieldstone mainly appears in the sandy units of the Eocene in Western Flanders (Belgium). It occurs as lenses and banks parallel to the stratification. From Roman times onwards, these were locally intensely cultivated as local building stones. Furthermore archeological evidence points out fieldstone was used in prehistoric times to make various artifacts like scrapers and jacks.

The purpose of our study is to characterize fieldstone from the different known geographical and stratigraphical localities. Ambiguous stratigraphical classifications of fieldstone outcrops in the past have complicated previous studies of fieldstone. Therefore, we aim to provide clarity over its stratigraphical occurrence and deliver additional information about its formation. The ultimate goal is to trace back the origin of the fieldstone used in buildings and for archeological artifacts to a distinct locality.

For the characterization of the fieldstone different techniques were used. Thin sections were examined by petrographical microscopy in order to study grain size, porosity, mineralogy, degree of silicification and in some samples microfossil content like silicified foraminifers. Porosity was determined with volumetric analysis and high resolution X-ray computer tomography. Attention towards the dinoflagellate content was given. This can provide information about the age and depositional environment of the silicified sands. In addition, it can act as a distinct feature that is characteristic for one locality or stratigraphic layer. A selected amount of samples were chemically analysed with Laser Ablation Inductively Coupled Plasma Mass Spectrometer in order to check if this could provide a chemical fingerprint which can be used to distinguish fieldstone coming from different localities from each other. By combining all this information we aim at composing an outline to trace back the origin of the fieldstone used as building stone and for artifacts.