investigated areas in the Miocene basin of Transylvania. The total methane flux in Berca area is exceeding 1000 t CH_4 $^{y-1}$.

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Stones and quarries of Castle of Chambord, France

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The project "SACRE" is based on the achievement of a health record from Chambord castle and aims to provide a basis for scientific monitoring and planning of restoration work using health and aesthetic specific criteria. The collected data (nature of degradations, weather measurements, architectural and historical archives) are used to reference all the information necessary to establish a detailed diagnosis of the state of alteration of the monument.

This program of research both fundamental and applied is divided into 5 parts:

1. The CAD modelling aims at constructing a graphic base used to gather all data acquired during the project.
2. The realization of the health record of the book will reference all the information necessary to establish a detailed diagnosis of the state of alteration of the monument: mapping of degradations, weather conditions, architectural and historical archives.
3. The simulation and prediction of degradations, which is the most fundamental step of this research program, is to simulate both in sequences of experimental laboratory and in numerical modelling the process of degradations in order to understand their evolution and to estimate their kinetics.
4. The creation of a tool for decision support is the application of simulation to work, and aims to estimate the rate of degradation. Added to that a costing of restoration, this software tool will provide a rational schedule of restoration work.
5. The valuation of the project to the public will be achieved by giving an access to a simplified version of the software, presented at an exhibition at Chambord.

The castle has undergone many restorations and architectural changes that have resulted in replacement of stones. Dating and identification of rocks were determined by searching in the historical and architectural archives that are sometimes incomplete. In developing the health record of the castle, we aim to identify and localize all the stones used over the time since the sixteenth century for the construction and for the restoration.

The 'tuffeau', porous chalk-lime and with very low mechanical strength, is the stone most commonly used in construction of buildings in the Loire Valley. It was also used for construction and restoration of the castle of Chambord. Stones used in the sixteenth century from quarries that are no longer used today. Over the successive restorations, new quarries have been opened.

The objective of this study is to identify geographically the various careers that have served the construction and restoration of the castle of Chambord, and locate the different stone facades employed. Indeed, these stones juxtaposed on the building are not always compatible. Correlating these data with the changes observed on the walls can give indications about the evolution of alterations observed on the chateau.