



HAL
open science

**THE MACQUENOISE SANDSTONE: A suitable
Lochkovian raw material for ancient millstones:
quarries, properties, manufacture and distribution
(Belgium-France)**

Paul Picavet, Sibrecht Reniere, Veerle Cnudde, Wim de Clercq, Roland
Dreesen, Gilles Fronteau, Eric Goemaere, Else Hartoch

► **To cite this version:**

Paul Picavet, Sibrecht Reniere, Veerle Cnudde, Wim de Clercq, Roland Dreesen, et al.. THE MACQUENOISE SANDSTONE: A suitable Lochkovian raw material for ancient millstones: quarries, properties, manufacture and distribution (Belgium-France). 5th International Geologica Belgica Congress (GB2016 Mother Earth), Jan 2016, Mons, Belgium. . hal-01362125

HAL Id: hal-01362125

<https://hal.univ-lille.fr/hal-01362125v1>

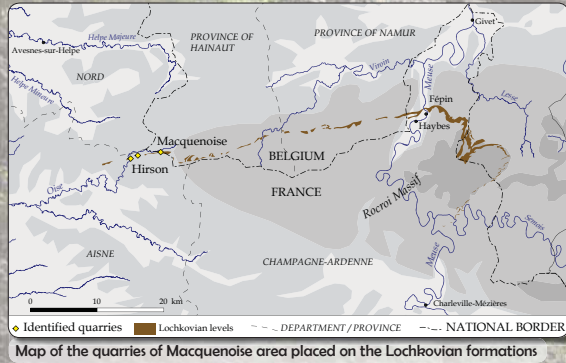
Submitted on 5 Jan 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

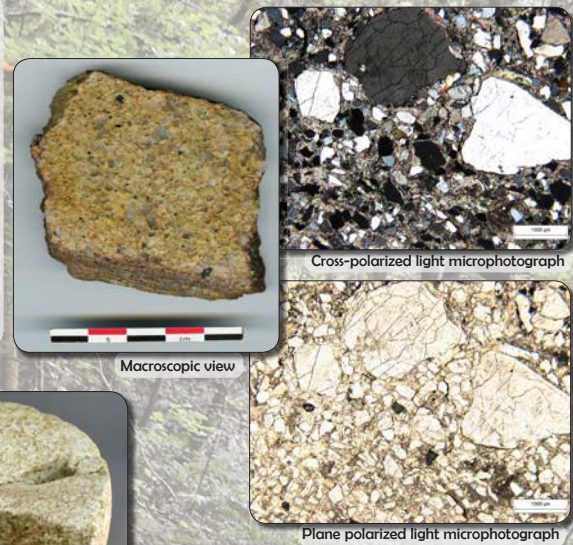


THE MACQUENOISE SANDSTONE : A suitable Lochkovian raw material for ancient millstones : quarries, properties, manufacture and distribution (Belgium-France)



Since a few years a French-Belgian team of archeologists and geologists works on the characterization of ancient querns and millstones (mainly from the Antique period) in relation to the determination of their stratigraphical and geographical provenances.

Through the identification of the rocks, their origin and their distribution, this collaboration aims at reconstructing the ancient commercial roads and the economic organization of territories during that period.



From geological characterization...

Near the Ardenne border between France and Belgium, the earliest Devonian (Lochkovian) sediments deposited on the Caledonian substrate are conglomerates, which are interpreted as continental alluvial fans.

A sandstone formation, formally defined as the "Arkose d'Haybes" is closely linked to the former Lochkovian conglomerates (called also the "Poudingue de Fépin"). The «Formation de Fépin» crops out around the eponymous localities : Haybes, Fépin and Hargnies (Ardennes, France), and displays a partly recrystallized, well-sorted grey to greenish sandstone (turbidite facies) with wine-red coloured joints.

Another important area displaying old quarries in the same formation is located between Hirson (Aisne, France) and Macquenoise (Hainaut, Belgium): here, a more homogenous grey coarse sandstone facies occurs, with a better consistency and small amounts of dark green tourmaline crystals.



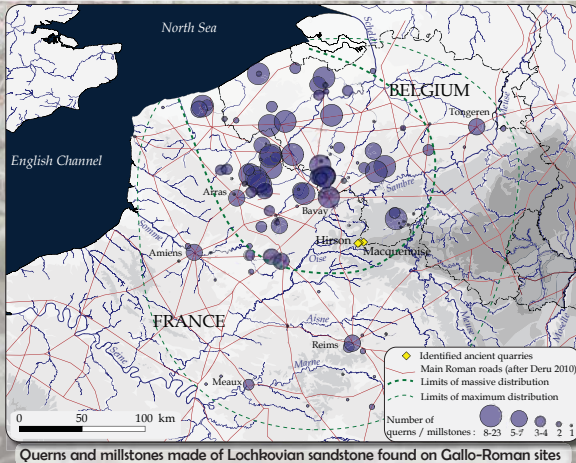
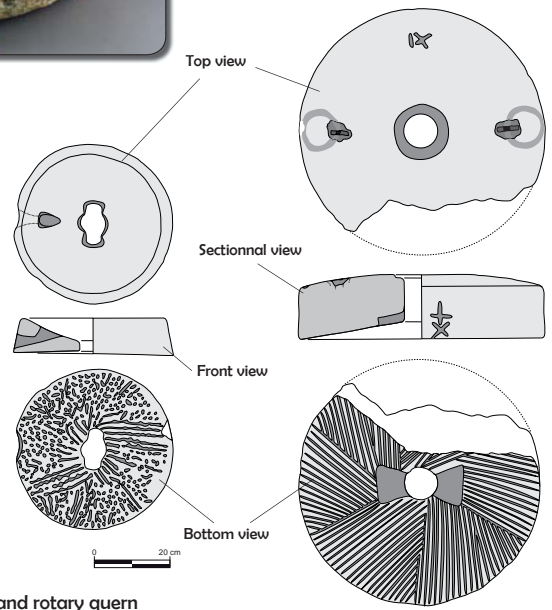
...to archaeological investigation

These detrital formations were locally quarried, not only for building stones but also for the manufacturing of querns and millstones. The huge Proto-historical and Roman millstone quarries in Lochkovian conglomerates and sandstones of Macquenoise and Miloud areas are known and identified since the end of the 19th century.

Even if the lack of recent archaeological excavations do not allow yet to precise the exact age of their quarrying, the dating of the various products derived from these quarries allows to consider the duration of the active extraction and how far the millstones from Macquenoise area were transported into the northern Gallo-Roman provinces.

These products consist both of small querns operated in domestic hand mills, and of large millstones used in hydraulic geared mills. They are massively found on Roman archaeological sites of the North-western Ardennes and the Western Flemish Basin, 100 km from the Macquenoise area (regional scale). These heavy goods are still but sparsely unearthed in a 200 km radius, especially in big Roman cities, well served by the main commercial roads. This distant distribution however requires more than one day of transport by inland waterway and more than five days by road.

Roman rotary querns and millstones made of Macquenoise sandstone



- Paul PICAUVET¹
- Sibrecht RENIERE²
- Veerle CNUUDE³
- Wim DE CLERCQ⁴
- Roland DREESEN⁵
- Gilles FRONTEAU⁶
- Eric GOEMAERE⁷
- Else HARTOCH⁸
- Millstone Study Group⁹

BIBLIOGRAPHY
 HARTOCH (ed.) et al. 2015 : *Moulin au Pays des Tongres*, Tongeren, Publications of the Gallo-Roman Museum, 416 p. (Atlantica 7)
 MELIÈZE 1984 : « La Formation de Fépin (Gedinnien de l'Ardennes) : un marqueur régional lithostratigraphique et structural », *Ann. Soc. géol. Nord*, 103, 37-53.
 PICAUVET et al. 2016 (En press) : « Les productions de meules en grès dérivées d'arkose d'Haybes (Macquenoise de la fin de l'Âge du Fer à l'Antiquité tardive dans le nord de la Gaule. Caractérisation typologique, chronologie et diffusion », in BUCCHENSCHUTZ et al. (ed.), *Les meules à grain du Néolithique à l'Époque Médiévale: technique, culture, diffusion, actes du colloque de Reims 15-17 mai 2014*, Dijon, (Revue Archéologique de l'Est, supplément)
 1. Univ. Lille, CNRS, Ministère de la Culture et de la Communication, UMR 8164 - HALMA - Histoire Archéologie Littérature des Mondes Anciens, F-59000 Lille, France.
 2. Ghent University - Faculty of Arts and Philosophy, Historical Archaeology Research Group (HARG), Sint-Pietersnieuwstraat 35-UFO B-9000, Ghent, BELGIUM
 3. Ghent University - Faculty of Sciences, Department of Geology and Soil Science, Krijgslaan 281, S8, B-9000, Ghent, BELGIUM
 4. Geological Survey of Belgium, OD Earth and History of Life, Royal Belgian Institute of Natural Sciences & Gallo-Roman Museum, Tongeren, BELGIUM
 5. GEGENAA (EA3795) Université de Reims Champagne-Ardenne, 2 Esplanade Roland Garros, F-51100 Reims, FRANCE
 6. Geological Survey of Belgium, OD Earth and History of Life, Royal Belgian Institute of Natural Sciences, 13, Rue Jenner, B-1000 Bruxelles, BELGIUM
 7. Gallo-Roman Museum, Kieldersstraat 15, B-3700 Tongeren, BELGIUM
 8. Groupe Meule : <https://groupeule.hypotheses.org>