

Appendices

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Acknowledgements

This thesis is the result of decades of exploration and enjoyment of underground quarries, mines and tunnels of the South Limburg Mergelland region. I grew up going to the underground quarries in the forests. This was of course not allowed, but children do as they do, and they still go to these places and explore them. The first tension of the darkness and the fear of getting lost, is soon replaced with the enjoyment of and adventure of being underground. Growing up, this excitement and action was replaced with the pleasure of being in a place of silence, of restfulness, of relaxation and the underground darkness became a welcome home where I felt at rest and at ease. ~~Ad w~~ ~~thrgtg im~~ ~~ool go~~ ~~amo~~

Chapter 1 Introduction

1.1 Aims and Goals

This master thesis studies the man-made underground structures in the Mergelland region in the south of the Netherlands, crossing into neighboring Belgium (see fig. 1).

These man-made underground structures, covering 6000 years, have been studied by a wide variety of

Photograph J. Spee 1983.

Photograph J. Orbons,

Opencast quarrying removes the artefacts of previous quarrying. Put simply, yesterday's

In contrast to this, the Belgian municipality of Riemst presents itself as mergel community and makes every effort to preserve quarries and to list them as monuments

At the end of the Linearband ceramic (LBK) period, the deposits of flint at Banholt were depleted, so a new source of flint was needed. A new source of flint was found nearby on the slopes of the Maasvalley

All of these numbers are taken from Felder PJ/Rademakers 1998). Many points can be discussed and these are at best estimates and guesses. The analyses by De Grooth come up with other numbers, both demonstrating that these mines were extensively used in a process to create flint for a much larger area (see fig. 12).

There are of course more flint mines in the area. Several are opencast, but they have

2.2.2. Chalk mines

Limestone has been extensively extracted in Mergelland over the last 2 millennia for a wide variety of uses.

It is not known if the Neolithic

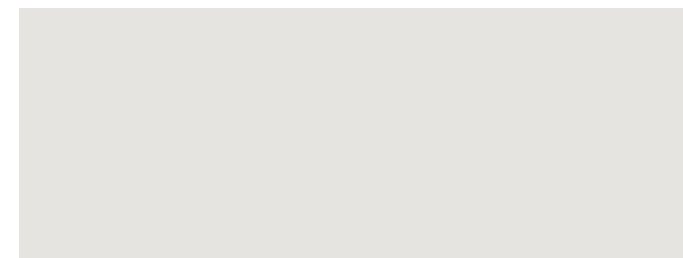
underground quarries. During the war there was a fear of poisonous gasses as an act of war so only extensive shelters with air-treatment would suffice. This fear for poisonous gasses was reduced during the last months of the war in 1944 so the

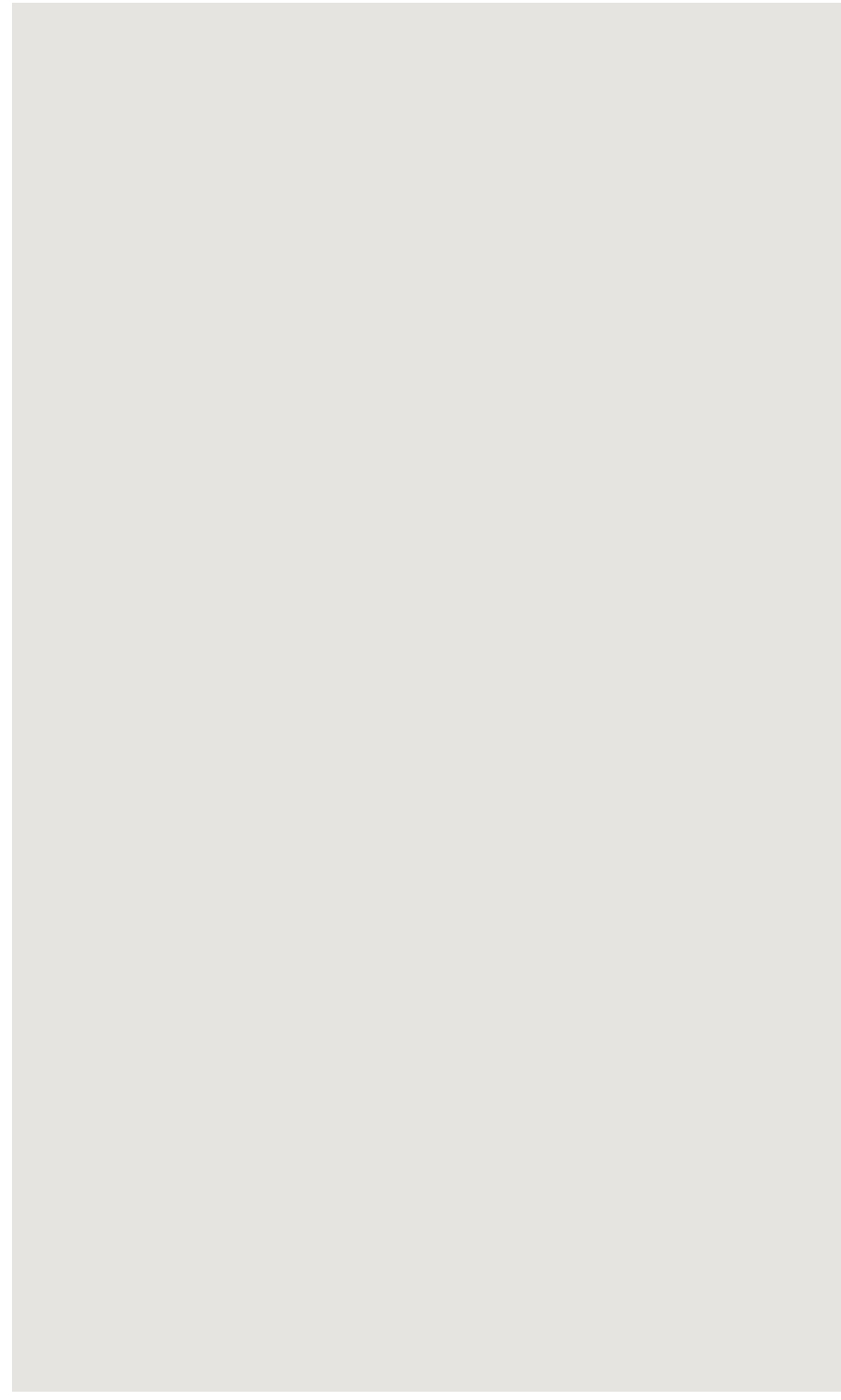
Tourism is an important secondary use. The galleries of Sint Pietersberg have been

Chapter 3 Predictive model of underground limestone structures.

3.1 Introduction

Members of the public sometimes think that archaeological remains appear





4.2 LIDAR analyses to find entrances and quarries

in a wooded area but the trees were filtered out with the Last Reflection method (Werbrouck *et al.* 2010).

The data was processed in a GIS. The excavated area is 2299 m². In that area 21491

Chapter 5 Archaeological regulations and research agenda.

5.1 Archaeology in the Dutch Erfgoedwet 2016, KNA 4.0, NOaA 2.0

Dutch archaeology is regulated through the Erfgoedwet 2016 (Heritage law 2016) (Ministerie OCW 2016). This law came into effect on January 1st 2016. This law

Article 3.13 gives the option that a monument and associated cultural goods can be scheduled as an ensemble. The underground locations in the Mergelland area clearly qualify as an ensemble.

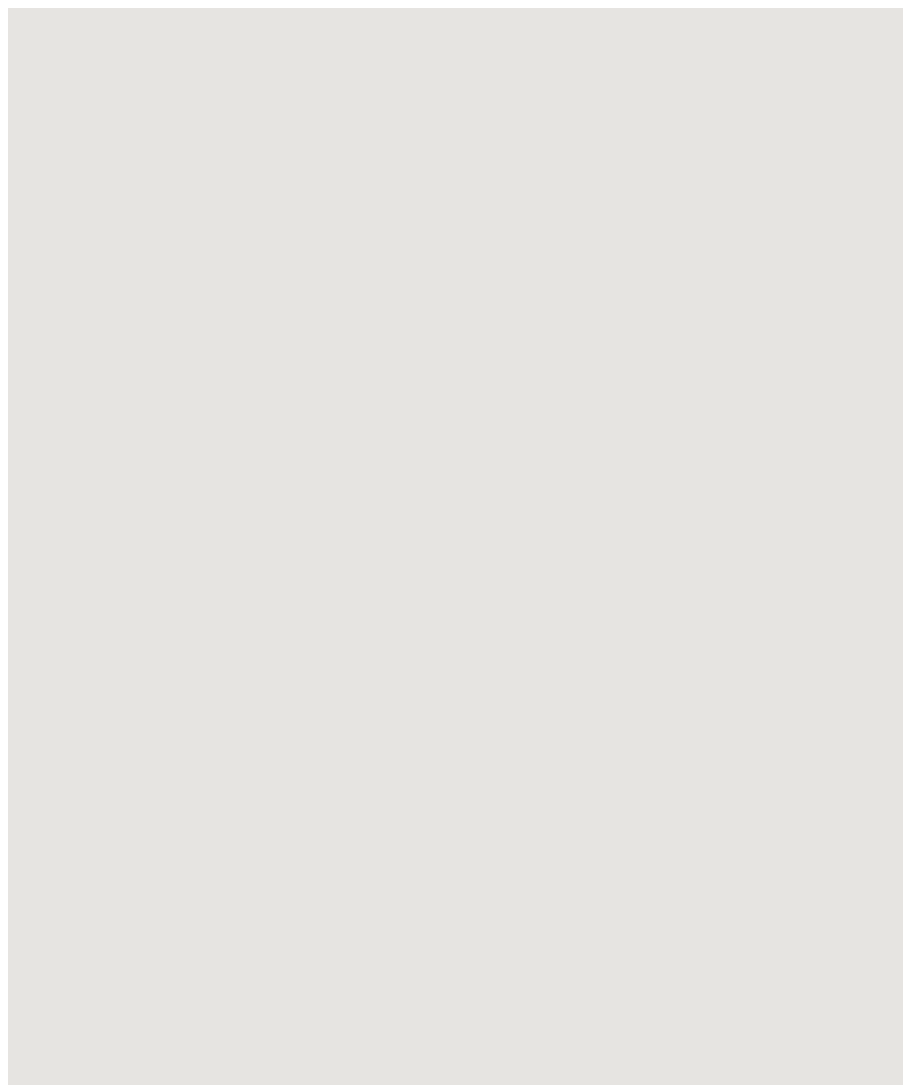
The national register of monuments, goods and ensembles are maintained by a governmental server, RCE. Counties and local councils can also schedule monuments on local lists and of course the UNESCO scheduling is also referred to. As described in Chapter 1.2 of this study, some parts of the quarries in the Mergelland are scheduled monuments like the Neolithic Flint mine, the post-medieval church in the Gemeentegrot, etc.

Chapter 4 of the Dutch heritage law deals with the protection of heritage. The owner of a scheduled monument must inform all users of the monument status and must allow the Inspector of Monuments access to the monument. Certain limitations concerning changes to the monuments are also described.

Chapter 5 describes the archaeology. Only certified institutions are allowed to do archaeological work. The law refers to the KNA concerning details of the archaeological work (see Chapter 5.3).

The last series of chapters deals with the rights and obligations of inspectors and

and of the archaeological work. The law refers to the KNA concerning details of the archaeological work (see Chapter 5.3).

**NOAA 2.0, question 30:****What changes and diversifications took place at the end of the LBK?**

This question is relevant to the flint mine as the flint mine developed at the end or just after the end of the LBK. Maybe the (industrial) processes of the

6 Conclusions

The goal of this study is twofold. First, it is shown that the man-made underground

Appendix 4: Archaeology and history of the Mergelland region

Appendix 5: Discovering the Rijckholt Flintmines

Marcel de Puydt was a Belgian university researcher at the end of the 19th century and had an interest in archaeology. He had been surveying and prospecting in the fields near Mons (Belgium) where the Spienne Neolithic flint mines were discovered. This site was (and still is) a very extensive site of shafts and was recognised as an

except a book with photographs (Bertrand 1929) donated to the owner of the Flint mine, the Count de Geloës from Eijsden.

Only in 1922 did the site attract the attention of Dutch archaeologists due to the

Appendix 9: Extend and inventories of the quarries

In figure 70 a map is given with all the known man-made underground limestone quarries. The area spreads over two countries, Belgium (Flanders and Walloon)

Appendix 10: Features relating to the underground quarries

Appendix 11 Tunnels in the Mergelland area

Railway tunnels

Only one railway tunnel has been made in the limestone. The Geertunnel (see fig. 31) was created in 1915-1917 as part of the Montzenroute by the German army to connect the harbor of Antwerp to the Ruhrdistrict, avoiding the neutral Dutch territories²³

Transport tunnels

There are a wide variety of transport tunnels, tunnels specially made to transport

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