

# The Underground Cities of Derinkuyu and Naours through the Lens of Urban Morphology

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## Introduction

Derinkuyu is located in the region of Cappadocia in Turkey (Figure 2). This underground city, carved from volcanic tuff, occupies about 2,500 m<sup>2</sup> dispersed throughout its 18 levels that descend up to 85 m below the surface (Aydan and Ulusay 2013). Some believe the city once held up to 20,000 occupants and believe the city offered shelter during periods of conflict above ground (Nývlt et al. 2016:2253). Naours resides in northern France (Figure 3), where it was initially carved as quarry in the region's limestone. The site dates back to at least 1331 (Lefèvre-Pontalis 1923:237), and though it was converted into a shelter during times of warfare (Prilaux et al. 2017), we are not aware of when this shift initially occurred. What does the urban morphology of these sites indicate about their uses?

## Theory

In this study, urban morphology serves as a theoretical framework through which one can better interpret Derinkuyu and Naours, two archaeological sites with little available information. Urban morphology describes a facet of urban study that focuses on elements of urban form such as open space, street networks and structures (Schirmer and Axhausen 2015:101-102) in an attempt to reconstruct the evolution or settlement of a city (Moudon 1997:3). It further stresses the significance of buildings/lots, streets/blocks, and the city itself and region (Moudon 1997:7). In these applications, the “building” translates to underground rooms and the streets to tunnels.

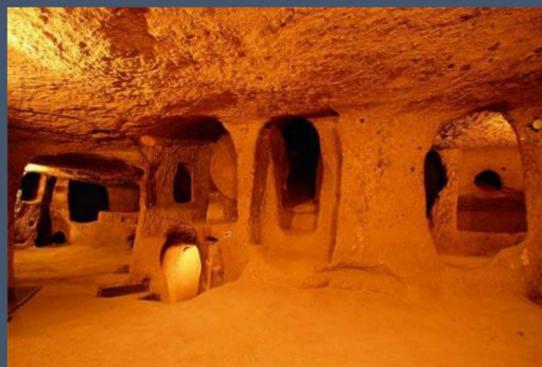


Figure 1 View of Derinkuyu with a millstone door visible in center (Farid 2014: Fig. 4)

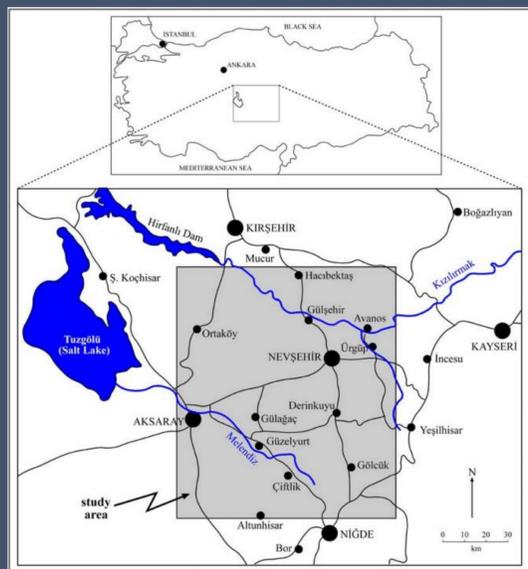


Figure 2 Map of Derinkuyu's location (Ayhan 2004: Fig. 1.2)



Figure 3 Map of Naours' location (Crossland 2019)

## Methods

This study predicated itself on the thorough study of the city plans for Derinkuyu and Naours (Figures 4 and 5). In particular, it analyzes the ways in which open space, street networks, and structures (Schirmer and Axhausen 2015:101-102) relate to one another and what that relation means for the uses of Derinkuyu and Naours. Studies of the sites' histories through literature, as well as formal analysis of images of the sites and records of material culture supplement this project. The approaches for both sites remain fairly similar. A trip to France, made possible by the Copeland Fund from the College of Wooster, allowed further exploration into the context surrounding Naours. While COVID-19 restricted access to the site itself, the trip provided opportunities to visit related museums and other underground sites that substituted the intended site visit.

## Data

Derinkuyu is split into sections divided by millstone doors (Figures 4 and 7), creating different functional spaces. These sections (predominately seen in the bottom right of the plan) offer access to the main necessities of life, underground or otherwise: water wells and ventilation shafts. Accessible through one main tunnel that can be blocked off by a millstone door, this section would offer privacy to inhabitants, elite restricted access, or a space far from the reach of any possible intruders. Beyond the millstone doors, Derinkuyu features small tunnels that significantly restrict movement. Naours does not have the same defensive organization as Derinkuyu. Its morphology is also much more systematic, rather than the organic excavation methods that describe Derinkuyu. This likely results from its beginning as a quarry. The tunnels of Naours are spacious, and they are not interjected with millstone doors. Throughout the city are a few wells and six ventilation chimneys (La Cité Souterraine de Naours), which articulate with houses above the city on the ground level (Salomon 1913:603; Figure 7). The rooms of Naours also all adopt similar shapes and sizes.

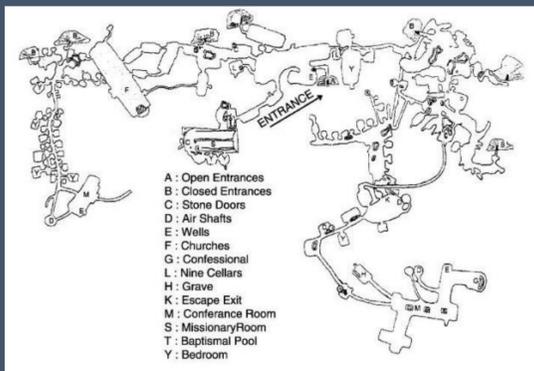


Figure 4 Plan of Derinkuyu (Muthu 2008: Fig. 1.3)

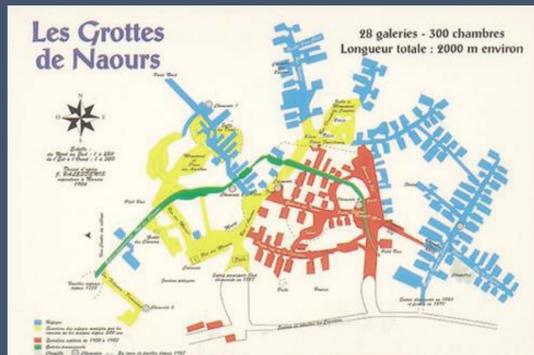


Figure 5 Plan of Naours (La Cité souterraine de Naours)

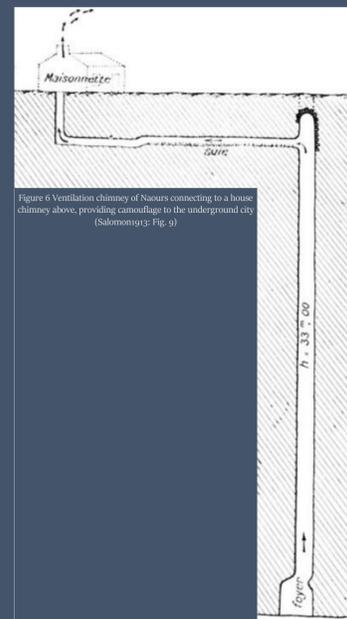


Figure 7 Hypothetical use of a millstone door for defense (De Pascale, Bisio, and Cabot 2012: Fig. 16)

## Analysis

Comparing the morphology of this section to the rest of Derinkuyu's plan, it clearly serves a distinct purpose. The other sections, such as on the left of the plan, which looks similar to an above ground neighborhood with interconnected bedrooms near a chapel space and meeting room, perform more colloquial functions. This strays significantly from the bottom right area. While the former is very open to movement with different tunnels, the bottom right is very restricted. This space does not meet everyday needs and its location suggests limited visitation. Whether this is due to defensive precautions or otherwise remains unknown. The protective doors and small tunnels would further restrict movement of invading groups, supporting a defensive purpose. Naours served as a shelter during periods of conflict (Prilaux 2017). However,

the urban morphology of the site does not confirm this on its own. The layout of the city does not offer any defensive characteristics, aside from the camouflaged ventilation shafts (Figure 6). With this in mind, along with Naours' establishment as a quarry, it likely served as a shelter out of convenience rather than design.

## Conclusion

The underground cities of Derinkuyu and Naours offer wonderful case studies for the theoretical application of urban morphology to archaeological and rock-cut sites. These fascinating sites do not have available excavation reports or abundant literature about them. As such, they provide an excellent opportunity to explore what urban morphology can add to their studies. Both defensive underground sites, this study determines how the interpretation of their morphologies interacts with the existing literature. Derinkuyu, an organically carved city, supports its defensive function with small and sharply turning tunnels, as well as sectioned areas that provide further safety. Naours, on the other hand, retains its systematic rock-cut morphology from its time spent as a quarry, and seems to have adapted to serve defensive purposes out of convenience.

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