Wood utilization in the city of 's-Hertogenbosch (Southern Netherlands) in the last millennium

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Historical background

The city of 's-Hertogenbosch was granted city rights between 1184 and 1195 by Henry I, duke of Brabant. Along with the city rights came favorable privileges. This fueled trade in the city and marked the beginning of a period of explosive growth.
Within 150 years 's-Hertogenbosch grew from essentially nothing to the fourth largest city in the duchy of Brabant.
The first city walls were already too constrictive by the time they were completed, and a second, much larger area was enclosed
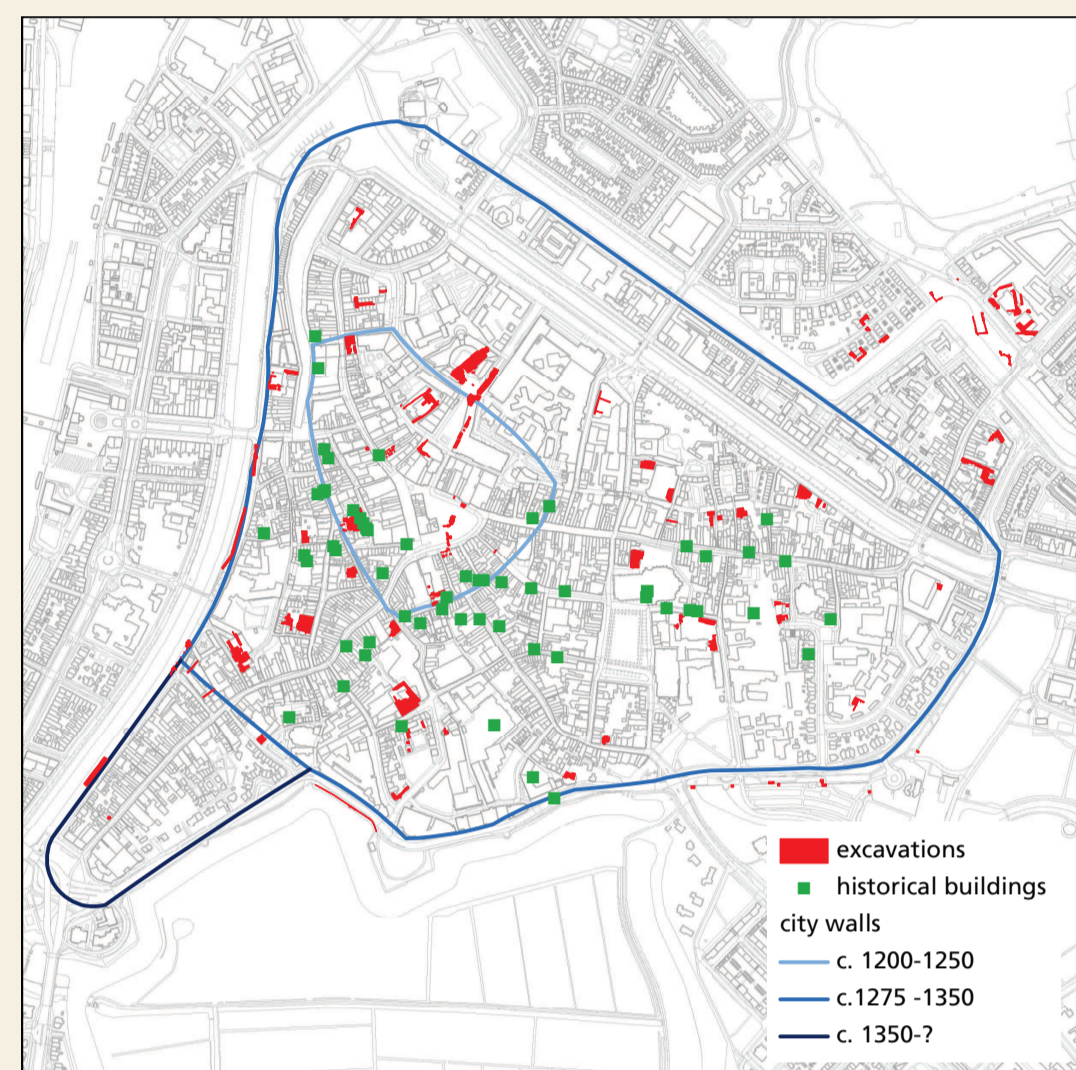
After this period the city continues to thrive and its extensive trade network encompassed large parts of Europe and beyond. The duchy of Brabant was both economically and culturally mainly orientated towards Spain. This ended around the middle of the 16th century. The eighty years war (1568–1648) crippled trade and in 1629 protestant forces conquered the city.

Economic importance shifted in the 17th century to cities such as Amsterdam that dominated the lucrative trade with the East Indies. All this led to a period of decline for 's-Hertogenbosch that would only be reversed with the arrival of the industrial age.

Location of the duchy of Brabant around 1300, the green square marks 's-Hertogenbosch

The old city centre of 's-Hertogenbosch with researched excavations and buildings.

Timber supply

's-Hertogenbosch literally means "the duke's forest". Tree ring research shows that oaks in the duchy of Brabant display relatively slow and regular growing tree-ring patterns up to the middle of the 13th century. This indicates that a closed, high rise forest existed in at least parts of the area. After the middle of the 13th century, these types of oaks become increasingly rarer and faster and more irregular growing oaks become commonplace. Around the beginning of the 14th century timbers are imported from the Meuse valley and Ardennes area in what is now Belgium. In 's-Hertogenbosch this is illustrated by the earliest dendrochronological dates for a harbour built with local oak of good quality in 1218, while the first confirmed imported timbers were used under the city walls between 1315 and 1339.

The decreasing quality of local oaks coincides with the disappearance of a specific type of water well. These wells are made of a single huge hollowed-out trunk (almost always oak). The absence of branches and slow growth also points towards a closed forest. Trees of these dimension no longer seems available at the start of the 14th century. Not all of these wells conform to this standard. Occasionally faster grown trees were used to make wells. The difference in growth condition can easily be deduced from the scars and deformation on the stem.

After local oak supply was depleted, the Meuse valley and Ardennes continued to provide the majority of construction oak for 's-Hertogenbosch for another 300 years or so. It seems that in the 17th century the Belgian forests are being depleted as well. For a brief period between 1600 and 1650 a small amount of oak is imported from West Germany and at the same the first conifer species arrive; Starting with Pinus sylvestris in the first half of the 17th century, this is followed by Abies alba in the first half of the 18th century and finally Picea abies appears in the late 18th of early 19th century.

The results from the wood identifications however not only show a broader range of species, which is not surprising, but also that conifer timbers were imported much earlier than the dendrochronological data shows. Abies alba, Pinus sylvestris and Picea abies all make their appearance somewhere in the first half of the 15th century.

Tree trunk used as a well. The stem is straight and without branches. Felling date 1104-1107
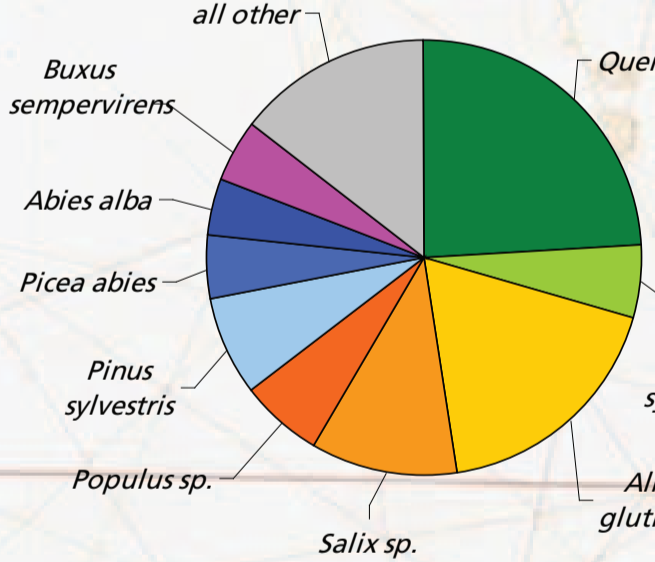

Tree trunk used as a well. The stem is twisted and has various scars. Note the two planks used to cover a large wound at the base of the tree. One of the planks dates in 1041 (no sapwood).

General description

The majority of the 1577 wooden find that were analyzed is (post) medieval refuse from households and workshops. This was dumped in cesspits that were no longer is use. In this way these cesspits reflect many facets of daily life in the city. The period in which the cesspits were in use can be bracketed between roughly 1375 and 1650 for the majority of cesspits.

The results given here are the preliminary interpretations of the finds. Not all of the more than 70 excavations have been fully elaborated and this may still take many years.

Generally speaking, more than half of all the finds can be reduced to four species. The next five species account for a further quarter and the remaining 40 or so species make up less than 15% of all the identified finds.

Wood identification results

species	carpentry	carving	vegetation remains	specific applications	earliest date
Abies alba	yes	yes		lid, unknown object	c. 1450
Acer campestre	yes	yes			
Alnus glutinosa	yes		yes		
Betula sp.	yes	yes	yes	unknown object	
Brosimum guianense		yes			c. 1525
Buxus sempervirens	yes	yes	yes	comb, bead, (knife) handle	c. 1375
Cesalpinia sp.		yes		unknown	c. 1525
Calluna vulgaris			yes		
Carpinus betula	yes				
Castanea sativa			yes		
Corylus avellana	yes	yes	yes		
Dalbergia sp. *		yes			c. 1650
Dalbergia sp. **		yes		knife handle	c. 1525
Empetrum nigrum		yes	yes	broom (bristels)	
Evonymus europaeus		yes			
Fagus sylvatica	yes	yes	yes	bowl, bead, handle, unknown object	
Frangula alnus	yes		yes		
Fraxinus excelsior	yes	yes	yes	handle	
Hedera helix		yes	yes	(brush) handle	
Ilex aquifolium		yes	yes	stoppers (for flasks)	
Juglans regia	yes	yes		various unknown objects	
Juniperus communis	yes		yes		
Ligustrum vulgare	yes		yes		
Lonicera sp.			yes		
Parashorea stellata	yes	yes		unknown object	c. 1575
Picea abies	yes	yes	yes	unknown object	c. 1400
Pinus sylvestris	yes	yes	yes	unknown objects	c. 1375
Platanus sp.	yes	yes	yes		c. 1525
Populus sp.	yes	yes	yes	bead, handle	
Prunus avium	yes				
Prunus padus	yes				
Prunus sp.	yes	yes	yes		
Pyrus malus/communis	yes	yes	yes	bead, (knife) handles	
Quercus sobur				cork	
Quercus sp.	yes	yes	yes	(brush) handles, unknown objects	
Rosa sp.			yes		
Salix sp.	yes		yes		
Sambucus sp.	yes	yes	yes	unknown object	
Swietenia macrophylla		yes			?
Taxus baccata		yes	yes	unknown object	
Vaccinium sp.			yes		
Viburnum sp.	yes	yes	yes		
Vitis vinifera			yes		

* probably Madagascar palissander
** probably South American palissander

Skane
Pine, c. 1375
Spruce, c. 1400

West Germany
Oak, 1600-1650

Central Europe,
Fir, c. 1450

Meuse valley
Oak, c.1350-1650

Eastern Mediterranean
Plane tree, c. 1525

Lisboa?

Cadiz?
Boxwood, c. 1375

Brazil
Palissander (*Dalbergia sp.*), c. 1525
Pernambuco (*Caesalpinia sp.*,) c. 1525
Letterwood (*Brosimum guianense*), c. 1525
Mahogany (*Swietenia macrophylla*), c. ?

South East Asia
White Seraya,(*Parashorea stellata*), c. 1575

Madagaskar
Palissander (*Dalbergia sp.*), c. 1650

Knife handles

One of the predominant crafts of the city of 's-Hertogenbosch in was knife production. The tropical en Mediterranean species imported in the first half of the 16th century can be related to this craft.
The species used to make knife handles reveal the extent of the trade network that supplied craftsmen with a variety of species in the late medieval period and first half of the 16th century.
This trade network connected 's-Hertogenbosch directly or indirectly with Spanish and Portuguese merchants that provided wood from Spain and Portugal's recently acquired possessions on the South American and East African coasts.

Legend

Trade route (small quantities) with port or presumed place of origin

Trade route (timber) with presumed place of origin

's-Hertogenbosch