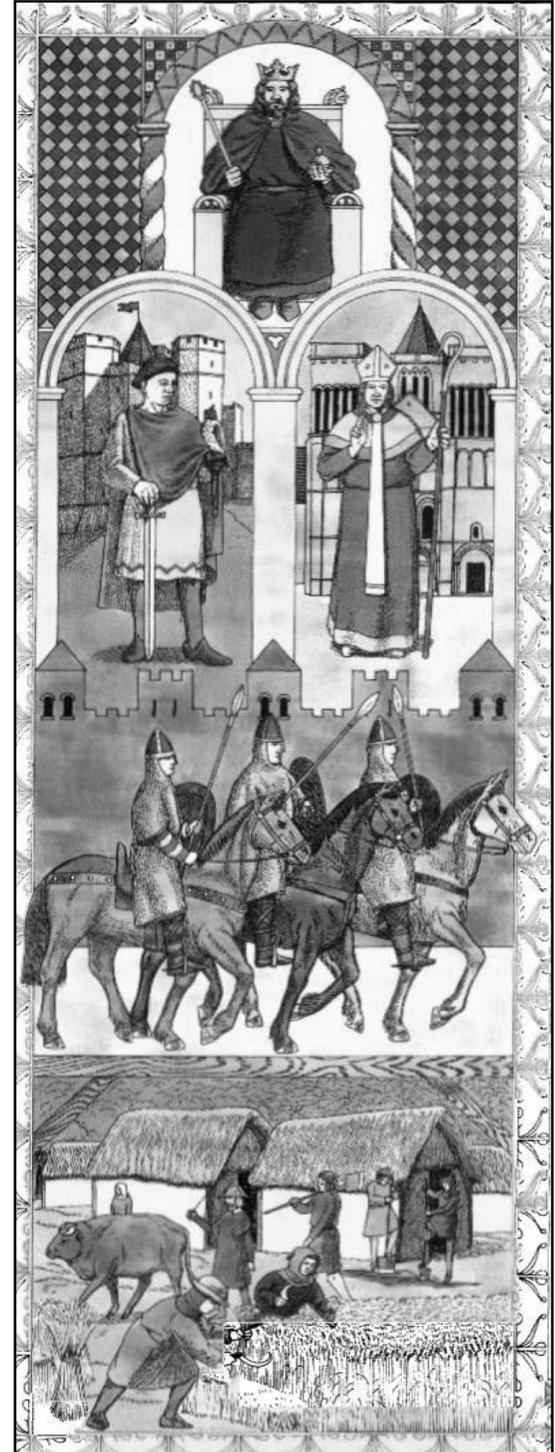


Medieval Technology: An Introduction

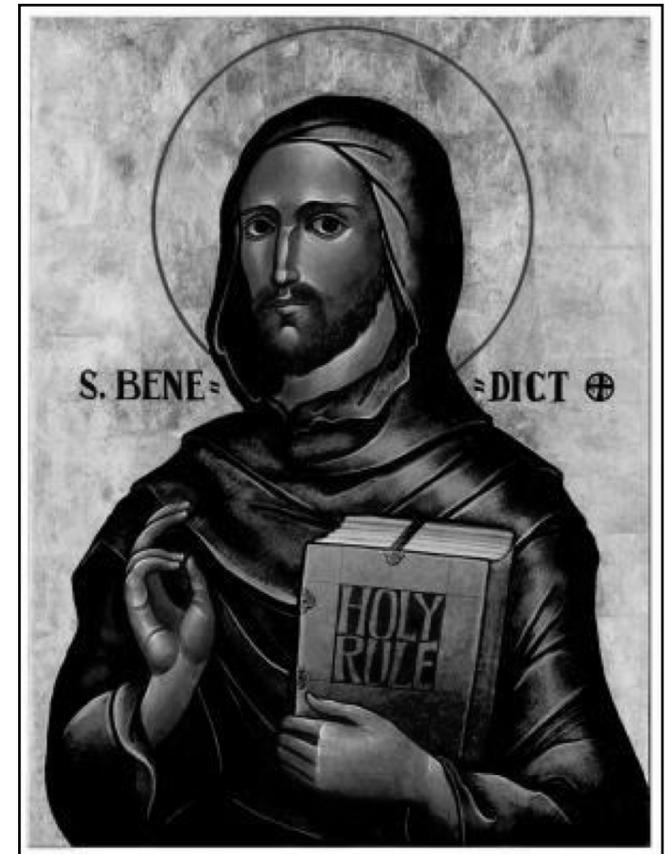
The Social Context of Medieval Europe

- The Social Order
 - There are different ways to think about this
- One useful way: The Three Orders
 - *Oratores* (those who pray)
 - *Bellatores* (those who fight)
 - *Laboratores* (those who work)



Oratores

- Numerous privileges
- Performed services
 - Interactions with others through sacraments
- Well-defined group
- Internal hierarchy and divisions
 - Priests, monks
- Monasteries: important site of medieval technology



Bellatores

- Knights: slippery concept
 - Initially, any mounted warrior
 - By time of Charlemagne: mounted warrior w/ armor, lance
- Overlap between nobility and knights
- Became obsolete by beginning 14th century



Laboratores

- Pretty much everybody else
- Largely peasants
- But also smaller (but growing) urban population
- Villages
 - Most people lived in villages → peasants, serfs
 - Most peasants were farmers, craftsmen
 - Social hierarchy
 - No discrete boundaries, but surrounded by farmland

Medieval Technology:

Some themes/questions to keep in mind

- What was “technology” to those who lived in the Middle Ages?
- What was the “science”-”technology” relationship?
- What were the effects of the rise of long-distance trade (c. 12th century)
- How did things change over time? From early to late medieval era
- What kind of variations across Europe?
 - Especially northern/southern Europe differences
- What was the relationship between gender and technology?
 - Example: women and cloth-making, changes over time
 - Another example: ale making

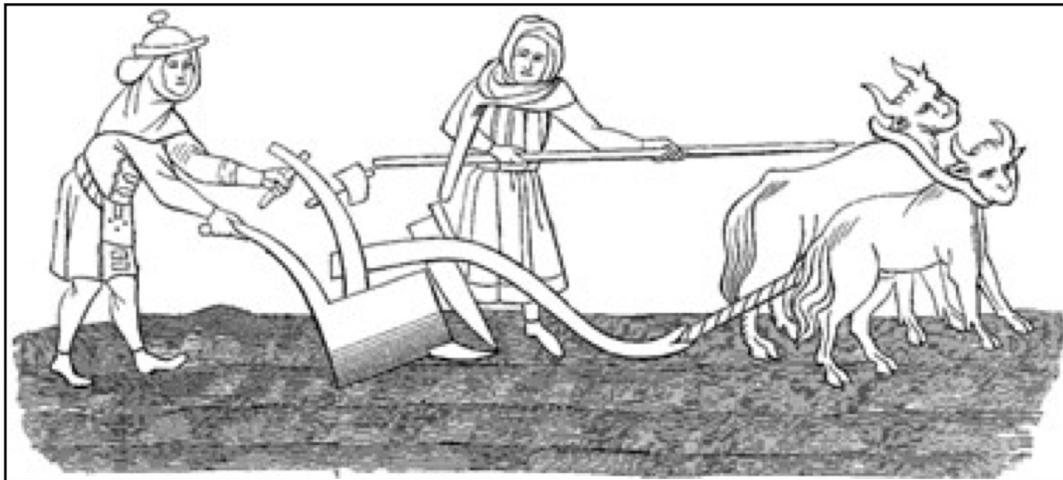


Technology = “The Mechanical Arts”

- Manual labor/skilled craft work began to gain in status through medieval era
 - Remember: ancient contempt for handwork
- By 14th century, mechanical arts looked on favorably
 - Why?
- Very few direct sources on Medieval technology
 - Because most of the knowledge was discursive
 - Latin used for the higher arts (universities focused on “liberal arts”)
- Key effect:
 - Spurred the writing of technical treatises
 - These transformed knowledge from discursive to formal form
 - Laid the foundation for both scientific revolution and industrial revolution

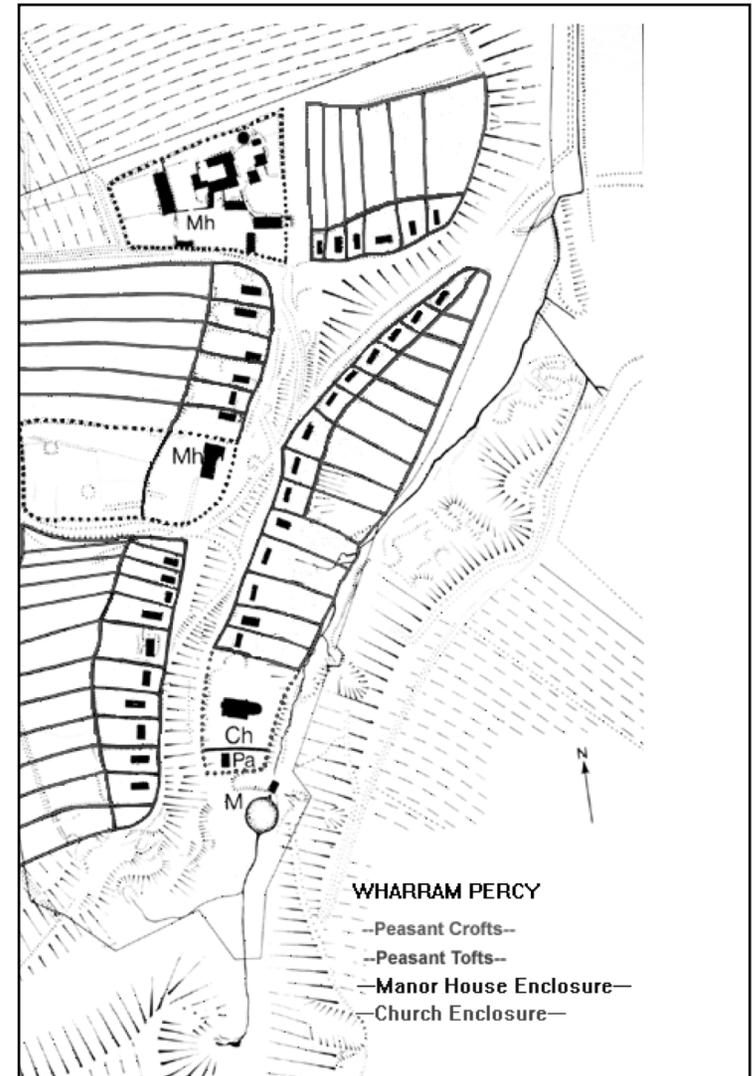
Agriculture

- Farming
 - Small farms: in-field, out-field agriculture
 - Large farms: open-field farming
 - early tools: shovels, plows (“ard”)
 - ard pulled by animal or man
 - difficult
 - Use of heavy plow
 - colter + plowshare + moldboard
 - heavy plow + wheel
 - what kind of effects do we see because of the heavy plow?
 - changed shape of fields
 - required more power to pull
 - » groups of oxen



Moldboard Plow

Source: Paul Lacroix, *Manners, Custom and Dress during the Middle Ages and during the Renaissance Period* (New York: D. Appleton & Co., 1874).



- Other tools
 - sickle → scythe

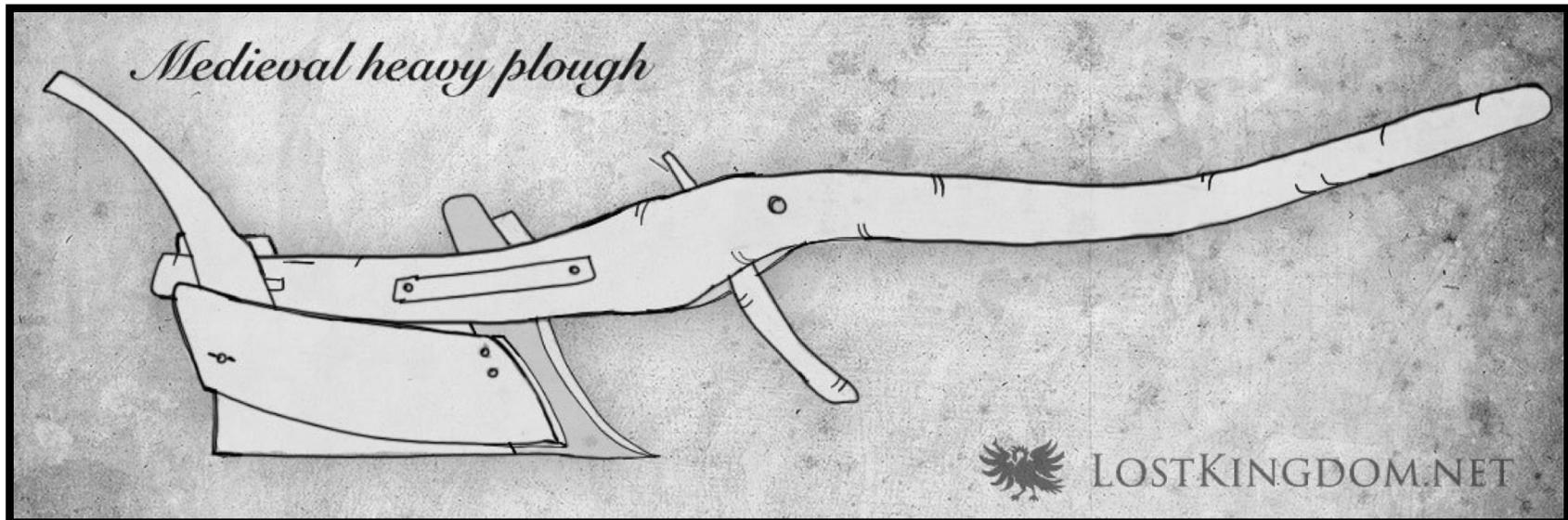


Agricultural Revolution in the Middle Ages?

- read Long, p. 40
- increased agricultural productivity beginning 10th century
- Some argue based on adoption of:
 - sickle → scythe
 - heavy (wheeled) plow
 - move from 2-field to 3-field system (in the 13th century)
 - read p. 42
 - rigid horse-collar and horse shoes (cattle - > horses)

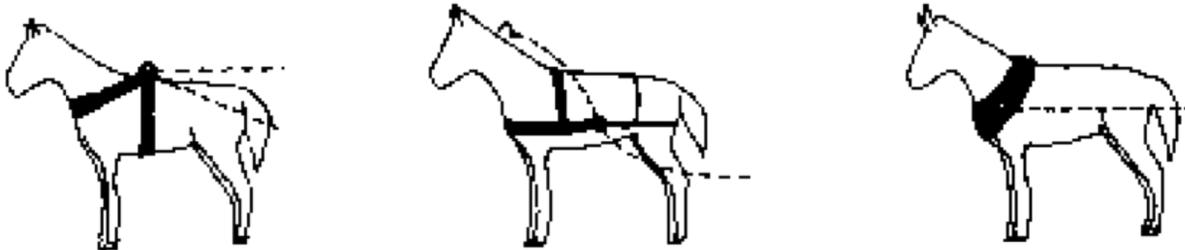
	Field 1	Field 2	Field 3
1 st year	<u>Fall</u> wheat & rye	<u>Spring</u> oats peas barley beans lentils	<u>Fallow</u>
2 nd year	<u>Fallow</u>	<u>Fall</u> wheat & rye	<u>Spring</u> oats peas barley beans lentils
3 rd year	<u>Spring</u> oats peas barley beans lentils	<u>Fallow</u>	<u>Fall</u> wheat & rye

Note that: wheat & rye
 peas, beans, lentils } feed humans,
while: oats and barley feed horses.

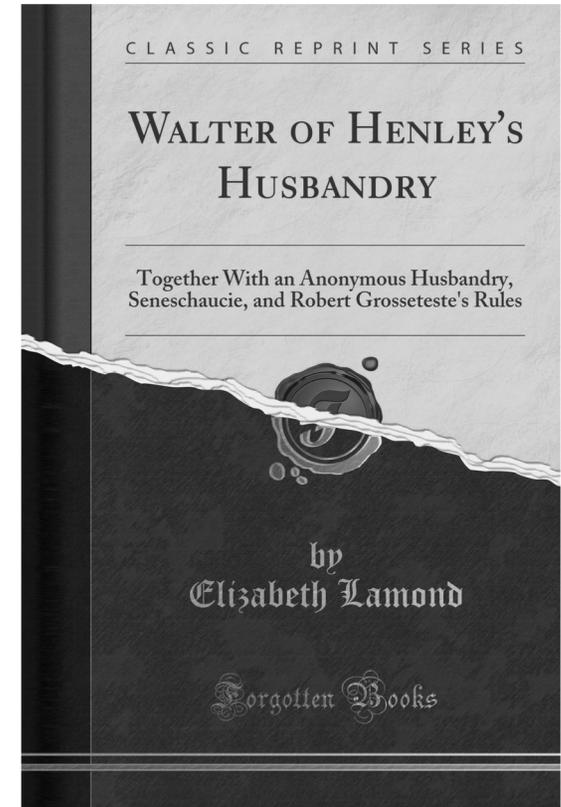


Gans, “The Medieval Horse Harness: Revolution or Evolution?”

- looks at horse harness and its effects in medieval Europe
- Roman use of horses: horse harness
- ox collar not suited for horses (“strangulation” for heavy loads)
- adoption of new technologies
 - breast strap, padded horse collar (8th/9th centuries)
 - roots: China, Central Asia, Islamic Civilization, local innovation
 - horse pulls against the collar using shoulders and chest
 - load attached to the bottom of the collar
- fueled gradual changes in agriculture
 - increased cooperation
 - rise of village councils
 - maturation of manorial system



- Walter of Henley's The Treatise on Husbandry (c. 1270)
 - a source that covers every aspect of agricultural management
 - descriptions of “demesne” (land belonging to the lord, i.e., lord's manor), pasture, buildings, gardens, woods, tenants, yields
 - selecting stewards, overseeing laborers
 - plowing, sowing, drainage, seeding, etc.
 - raising of animals
 - keeping of accounts
1. in this context, what does ‘survey’ the land mean?
 1. evaluation of value of everything on it
 1. land value depends on?
 1. size of land
 2. how much of it sown
 3. what kind of crops grown
 4. on what kind of crop system used
 5. what kind of agricultural technology used & its maintenance
 6. what kind of animals used
 1. read p. 3
 2. all of this implies what kind of skills, tools, etc.?
 1. advanced accounting
 2. understanding that technologies require maintenance
 3. understanding that technologies (such as ploughs) are embedded in a system that includes:
 1. land, animals, humans, food

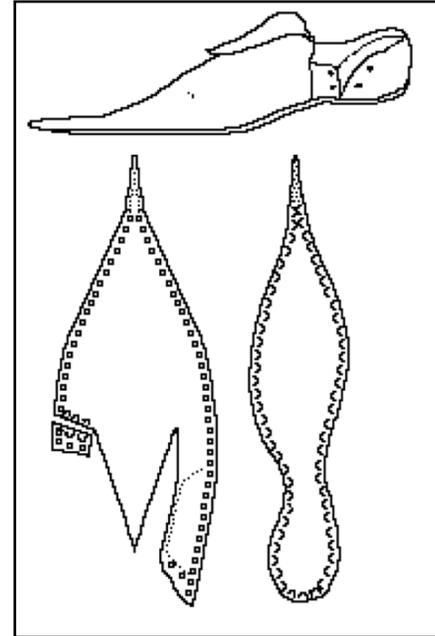


Technology and the Body

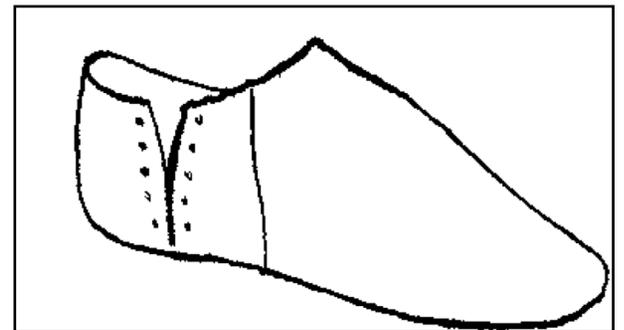
- How do our bodies relate to technologies?
- Examples?
 - how we hold things
 - how we interact with machines
 - clothing
 - protection from nature?
 - fashion ?

The Middle Ages

- clothes for peasants
 - made at home
 - coarse wool
 - linen undergarments
 - new ‘technology’ appeared in the 14th century among upper class in Italy:
 - buttons
- shoes
 - leather
 - ankle-boots
- eye-glasses



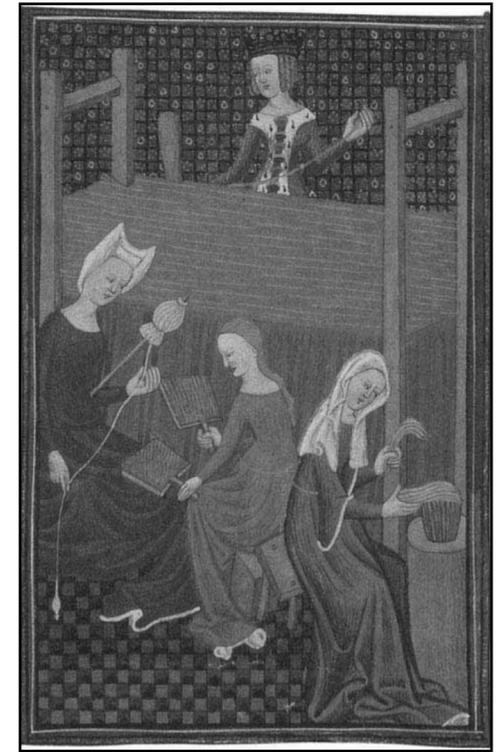
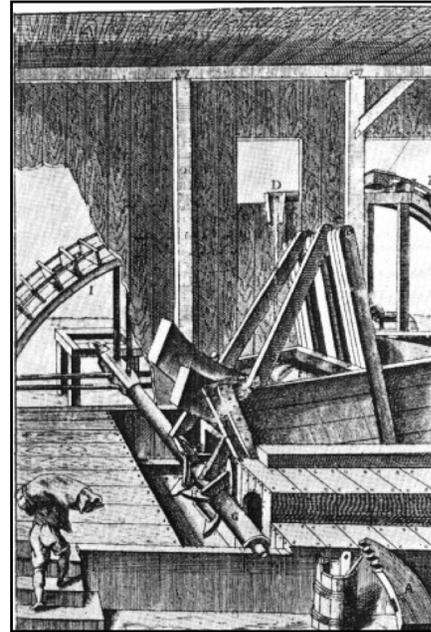
Basic Long-Toed
Shoe



Side-Laced Shoe

Clothing

- clothing
 - materials: leather, cloth, wool, linen, cotton, silk
 - Most important: wool
- Process
 1. wool from sheep
 1. shear wool
 2. prepare wool
 1. clean wool (by raking it in hot water & lye)
 2. separate long & short hairs
 3. dry wool
 4. beat wool to remove foreign matter
 3. “carded” or “combed” wool to disentangle fibers
 1. cards: leather implements with hooks
 2. combs: smoothing out
 4. spinning (to make yarn)
 1. before 13th century: just a wooden disc with a rod
 2. from 13th century: **spinning wheel**
 1. increased productivity 3 fold
 5. weaving
 1. in antiquity used vertical warp-weighted loom
 2. from 14th century
 1. use a horizontal (broad or treadle) **loom** to make the cloth
 1. operated by foot
 6. fulling
 1. washing and beating (made cloth shrink, thicker, durable)
 2. mechanized by use of mill (p. 18)
 7. dyeing
 1. colors from various plants (p. 19)



Some General Themes

- in early Medieval Europe, manufacture of textiles was local, family-based
- done by women
- by 14th century, wool production had become international in nature
- organized around 4 major “crafts”
 - weaving, fulling, dyeing, finishing
- textile workers began to be organized around **guilds**
- guilds
 - association of similar workers for mutual aid and protection
 - medieval guilds were usually of merchants or craftsmen
- most significant gender change occurred why/when?
 - change of the loom
 - in early Middle Ages, most vertical loom weavers were women
 - after introduction of the broadloom, most were men
 - required two people, for wider clothes
 - male dominance also came due to guilds and export-oriented business
 - read p. 54

Craft work and Guilds

- Two kinds
 - “free” = open to everyone
 - under guilds
- guilds developed in 12th/13th centuries
 - matured by 13th/14th centuries
 - originally as organizations of merchants
 - later as organizations of artisans
- they regulated training, apprenticeship
 - pupils were often children of the master
 - 4-10 years of training
- after apprenticeship became “journeymen”
 - dayworkers who worked for wages
- how did people become masters in their own right?
 - produce a masterpiece
 - needed approval from guild (i.e., guild regulated masters)
- guilds also (p. 53) :
 - regulated quality of products
 - protected secrets
 - through secrecy and through patents
 - why?
 - read p. 24
 - maintained monopolies
 - often had close ties to political power (e.g., Florence in early modern era)



Shoemakers guild (1568)

- What kind of craft work was typically done in the Middle Ages?
 - production of objects in daily life
 - pots & pans, harnesses, saddles, everyday glass and ceramic ware, plowshares, benches, stools
 - luxury items
 - fine leather gloves, jewelry, furs, glassware, silver plates, candlesticks, etc.
- Book describes production of
 - leather
 - pottery
 - glass
 - Some general themes
 - much of these things came from outside of Europe
 - pottery (influenced by China)
 - painted and ceramic pottery (Islamic world)
- All of these objects are the foundation of a kind of new ‘**material culture**’ of the Middle Ages
 - people and objects produced new cultural norms, practices