

## The Medieval Machine

### I. Revival of Trade

#### A. Vikings

#### B. The Crusades (1095–1291)

1. Europeans Viewed as Barbarous by Muslims
2. Positive Effects in Western Europe

#### C. Hanseatic League (13<sup>th</sup> to 16<sup>th</sup> centuries)

1. Lübeck, Hamburg, Bremen, London, Novgorod, etc.
2. raw materials from Baltic for products of west and south
3. gold and bullion flow
4. reasons for decline

#### D. Champagne Fair — Troyes

#### E. Pilgrimages (Tourism)

### II. “Industrial Revolution” of the Middle Ages

#### A. Energy Resources and Their Development

1. water mills (overshot and undershot)
  - a. Barbegal (3<sup>rd</sup> cent.)
  - b. Malt-smashing mill at St. Gall (9<sup>th</sup> cent.)
  - c. Domesday Book (5624 mills)
  - d. Venarfro
  - e. Robec Banks
  - f. Department of l’Aube
  - g. Liège, 1348, first water-powered bellows
2. Dams and cams

#### B. Weaving

1. loom
2. spinning wheel

#### C. Clocks

1. Water clock, mentioned by Jocelyn de Brakelond at Bury St. Edmunds in Suffolk, June 23, 1198
2. Alarm clock (11<sup>th</sup>-cent. MS, Benedictine Monastery of Santa Maria de Ripoll)
3. Verge and foliot

D. Mining and the Mineral Wealth of Europe

E. Environment and Pollution

### III Warfare of the Middle Ages (Metal Production)

A. Heavy Cavalry

1. armored knight on horseback
2. long stirrup
3. lance, shield, sword, chain mail

B. Unorganized — Battle of Liegnitz (April 9, 1241)  
— Battle of Mohí (April 13, 1241)

C. Infantry

1. Pike
2. crossbow
3. long bow — Battle of Crécy (1346)

D. Siege Weapons

1. Ballista
2. Cannon
  - a. Gunpowder—combination of saltpeter, charcoal, and sulfur
  - b. Chinese Invention (11<sup>th</sup> century)
  - c. Roger Bacon (ca. 1214–ca. 1292)
  - d. Siege of Constantinople (1453)

### IV . Agricultural Revolution of the Middle Ages

A. Technological Innovations and Borrowings

1. heavy plow
2. open fields
3. modern harness
4. three-field system
5. nailed horse shoe

B. Development of Husbandry