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Part I : Western European Economic innovations – Postclassical Period

Overview Just as the early modern centuries perpetuated myths about the ‘dark ages,’ they minimized the extent of innovation and technology in the long period from the Fall of Rome to the Renaissance. The fact was, that during the latter half of this period, western European cultures developed a number of significant life and economy improving innovations. We start with a few earlier innovations, then sample some later ones.

Earlier mediaeval innovations Innovations tend to arise as solutions to distinctive problems, not as systematic explorations of theory, like the hypotheses which generate major scientific developments. It is thus that we find the earlier mediaeval period addressing issues arising from agricultural practice, issues of domestic comfort, and architectural challenges. The innovative responses to these challenges were as various as the *heavy plough*, the *horse collar*--into which much time consuming practical experimentation was invested, and *horse shoes*, which were regularly applied by the 9th century; the *hypocaustic heating systems*, installed for example in the basements of monasteries, and which, though preceded by a long Roman tradition, were refurbished and activated to deal with the extreme cold of many early mediaeval dwellings and buildings; *the rib and barrel vaults* designed to carry the heavy weights of Romanesque architectural structures, and the elegance of which strikes us in the earliest churches of the mediaeval period, like Charlemagne’s Palatine Chapel, dating from 800 C.E.

Innovations of the later mediaeval period With the development of trade and the industries flowing into it, by the eleventh century C.E., the western European world found innovative ways of dealing with a wide range of challenges--agricultural, industrial, navigational, military, and of direct interest to personal comfort, like eyeglasses.

Agriculture By the later Middle Ages, the heavy plough was in widespread use, facilitating the deep turnover of soils, which, in places like Northern Europe, were often frozen, and required powerful *ploughshares* to prepare them. There was also fruitful experimentation in the planting of three field crops, with one field left fallow, so the soil could regenerate.

Industrial Stationary harbor cranes, while invented by the Greeks, were greatly strengthened and streamlined during the later Middle Ages, and could be employed to load and unload heavy maritime shipments in the major European ports.

Navigational Improvement in nautical compasses, and in the development of the stern-post rudder, added to the accuracy and safety of navigation.

Military Late mediaeval military movements profited from the development of neck-protecting helmets and full suits of plate armor. Gunpowder and cannons were brought to a new level of power by the 13th century.

Personal comfort By the 13th century, in Italy, eyeglasses were readily available to the wealthy, and brought that life enhancement many of us live by today. Mechanical clocks were in use in Europe by the 14th century.

Readings

White, Lynn, *Mediaeval Technology and Social Change*, Oxford, 1962.

Giles, Frances and Joseph, *Cathedral, Forge, and Waterwheel: Technology and Invention In the Middle Ages*, New York, 1994.

Discussion questions

Why was there relatively little innovation in the early centuries of the Middle Ages, then a major uptick in the twelfth century and after?

What were the major technical innovations required by the construction of the Gothic Cathedrals of the thirteenth and fourteenth centuries?

What will have been the consequences for human development of the invention of useable eyeglasses and then the printing press, in the Late Middle Ages and Early Modern periods?

Part II : Western European Trade – Postclassical Period

Overview From the early Mediaeval period to the flourishing of cities, cathedrals, and international trade in the thirteenth century, is a long stretch. If we date the breakdown of the Roman economy to the fifth century C.E., we will have to wait five or six centuries before we see the emergence of a vigorous trading economy in Europe. Involved in that development are gradual improvements in transportation--both by sea and land, in agricultural efficiency and know how, in the concentration of capital in banking centers, and in manufacturing processes, which readied foodstuffs, fabrics, and even building materials for long-distance transport.

The early Middle Ages The term 'dark ages,' pejoratively first applied during the Renaissance, but now rarely used, usually designated the period from 500-1000 C.E., when the deterioration of society, transportation, and trade had replaced the still serviceable vestiges of the Roman Imperial structure, which succumbed to 'barbarism,' both internal and external, by the mid-fifth century C.E. This 'early' period was not without cultural development--think of the Benedictine monastic tradition or the Carolingian Renaissance of the 9th century--but its foundations, in a still pretty stagnant agricultural economy, with little more than local trade, were mired down and unprogressive.

The trade explosion of the twelfth and thirteenth centuries Trade, culture, military prowess and urbanization went hand in hand in the Later Middle Ages. One can look at three facets of this development of trade: the maritime explosion of trading networks among interlinked regions; the growth of a commercial and banking culture; the rapid development of cities, with their fairs, markets, and manufacturing centers.

Maritime trade The twelfth and thirteenth centuries saw a rapid expansion of ocean trade. One factor in this expansion was the growing expertise in ship building, commercialization of seaworthy manpower, and establishment of reliable ports and harbors to which to ship the increasingly abundant products of European industry: wool, processed fabrics, wines, foodstuffs, horses. That is not to mention the exponential development of European port systems at which to receive spices and oils from as far away as China, the fruits and fabrics of the Muslim Near East, and wool from the British Isles, ready for the refinements of the Flanders textile industry.

Commercial and banking culture To bankroll the exploding maritime undertakings, of the High Middle Ages, required a network of lenders and bankers, who could put their hands on enough venture capital to send fleets of expensive cargo, of hundreds of workers and oarsmen, and often of cattle and cavalry, far

across the ocean. The seed ground for this new commercial industry was in large part the wealthy cities of North Italy--Genoa, Venice, Florence--in which high commerce and high culture co-existed at a fruitful level never since attained.

Cities and their relation to trade The two centuries which culminate the movement of Mediaeval Europe, the 12th and 13th, saw the rapid growth of population, of urbanization, and of the centrality of the city to commerce and trade. We talk here of a period during which great fairs attracted the economic energy of the civilized world, bringing together merchants from both the local scene and from as far away as ships could transport goods. We talk also of the atmosphere of the larger cities--say of Paris or Northern Italy or Flanders--where negotiations and deals were the name of the game, and rich and powerful families regularly schmoozed with international bankers.

Reading

Haskins, Charles, *The Renaissance of the Twelfth Century*, Cambridge (Mass.), 1971
Postan, M. M., *The Mediaeval Economy and Society*, Harmondsworth, 1972.

Discussion questions

There is a great population explosion in Western Europe, from the time of the Fall of the Roman Empire to the high economic flowering of the 13th century. How would you explain this population growth?

We stressed maritime trade. Did the patterns of inland trade, in Western Europe, suggest the same economic growth as maritime trade? What was the state of roads? Of transport vehicles?

There was extensive 'manufacturing' in the new cities of 13th century Europe. What were factories like? How many were employed in a large factory? Was there any wage and salary control? Were there unions?