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ANALYSIS OF WORKING HOURS

A part of European cultural patrimony rests on the relationships our ancestors had with time. A few examples chosen at random will suffice to show how their attitude toward this point evolved over the ages. The famous *Carpe Diem* by Horace[1] was an invitation to take advantage of the present moment. In Jewish tradition man's obligation to work was considered a curse.[2] Similarly a saying attributed by Pliny[3] to the painter Appelles emphasized the necessity of daily labor. In still other ages time appeared as the great destroyer of all things,[4] and Christianity promised its enemies tortures that were no less eternal than the joys it reserved for its disciples.

Translated by R. Scott Walker

[1] Horace, *Odes*, I, XI.8.
[2] *Genesis*, 2, 2-3.
[3] Pliny, *Natural History*, 35-36.
[4] Ovid, *Metamorphoses*, XV, 234.

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These different conceptions of time—and there are many others as well—are too contradictory for us to form an exact idea of the attitude of the Ancients in this respect,[5] and instead of getting lost in an analysis of ideas that perhaps expressed only personal viewpoints, we will attempt to see how our predecessors used time in a well-defined sphere, that of work.

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Today we are accustomed to a fixed unit of time made up of twenty-four hours of equal duration, distributed between night and day. But in order to achieve this result, it was first necessary to be capable of dividing time into identical intervals. Time has been measured since Antiquity, when Babylonian astronomers divided day and night into two parts made up of twelve hours of 60 minutes at 3600 seconds per hour. Among the instruments used at that time was the sun dial, which was precise but useless at night or when the sky is cloudy; and the water clock, practical except when the temperature drops below freezing. Hourglasses, relatively precise instruments, could be used only when modest in size; they were frequently employed on ships,[6] and are still today placed near the pulpit in certain churches in Denmark so that the pastor and congregation know how long the service will last.

Despite the obvious usefulness of these instruments for measuring time, only the mechanical clock makes it possible to divide time into equal intervals independently of the sun and free from the effects of temperature. This invention appeared in Europe during the fourteenth and fifteenth centuries, but it did not spread until after the mid-seventeenth century. Until the end of the Middle Ages—and sometimes even later—day and night each had twelve hours, but of unequal length: the day began at dawn and night after sundown.

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[5] See Kristof Glamann, "Il logorio del tempo", *Città e Architettura nella Roma Imperiale - Analecta Romana Instituti Danici Supplementum X*, Rome-Odense, 1983, pp. 9-10.

[6] Michel Mollat, *La vie quotidienne des gens de mer en Atlantique IXe-XVIe siècle*, Paris, 1983, p. 186. In Scandinavian countries, the quarter hours are subdivided into eight *glas* (glasses), indicating the importance of the *timeglas* (hourglass) on board a vessel.

As is still the case for agricultural laborers today, work time in the Middle Ages was during those hours when it was possible to see without using artificial lights. Until the thirteenth century life in most monasteries depended on agriculture and animal husbandry,[7] and the very rhythm of agrarian life became that of contemplative life. Thus the monastic prayers—the hours (*horae*)—began at dawn with *laudes*, which greeted the Lord at the birth of the new day and which also was the time for celebration of mass. Then came *prime* at the first hour of the day, *tierce* at the third hour, *sext* at the sixth hour (around noon), *none* at the ninth hour, *vespers* at sundown and, at the first hour of the night, compline (*completorium*). Moreover, there were prayers three times during the night in monasteries. Here is a chart showing the cycle of the hours.
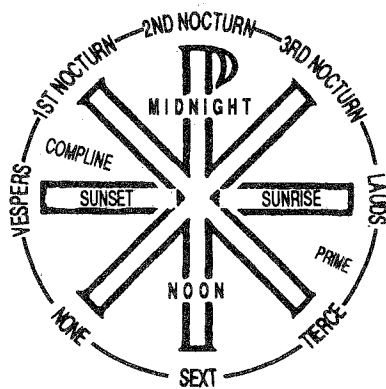
Source: Missel quotidien, vespéral et rituel, ed. Dom Gérard, Turnhout, Paris, 1962, pp. 23-24; *Novum glossarium Mediae Latinitatis ab anno DCCC usque ad annum MCC*, v. M-N, Copenhagen, Franz Blatt, 1959-1969, coll. 273-274; H.A.R. Gibb and J.H. Kramers, *Shorter Encyclopaedia of Islam*, Leiden, 1974, pp. 379-380.

[7] Cf. Jacques Le Goff, "Le temps de travail dans la 'crise' du XIVe siècle: du temps médiéval au temps moderne", *Le Moyen Age*, LXIX, 1963, especially pp. 597-600. The author notes the fact that the prayers of *none* were moved up in order to fall near noon, and he sees in this the result of pressure from urban workers. Our example of a Greek monastery mentioned later shows that there, too, agricultural necessities forced the monks to adapt themselves, particularly since the shift of *none* occurred from the tenth to the end of the thirteenth centuries when monastic life was especially linked to agriculture and animals (with the exception, however, of the development of the mendicant orders after 1200).

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The rhythm we have outlined here goes back, with few modifications, to the monastic rule of St. Benedict (around 529), but it is also linked to Jewish liturgical tradition. Obviously the hours were not an exclusive possession of the Catholic Church. The Orthodox Church also observed them, even though for practical reasons—such as limitations brought on by agricultural labor—the hours of the day could be grouped into two "blocks" with the first one beginning a little before dawn (μεσονύκτιον = matins, ὄρθρον = *laudes, prime, tierce* and *sext*) and the second (*none* and *vespers*) at the end of the afternoon; after the evening meal came *compline*.[8]

In the Jewish tradition ordinary days called for prayers in the synagogue in the morning, afternoon (like vespers) and evening, as well as private devotions at the third, sixth and ninth hours of the day.[9] A reflection of the division of time by periods of prayer can probably be found in the well-known parable of the vineyard owner who goes to the market to hire workers first in the morning and then at the third, sixth, ninth and even eleventh hours.[10] This liturgical rhythm can be found as well, although modified, in Islam at the time of the Prophet. The five ritual prayers are the following: *Faǧr* or *Subḥ* (just before dawn), *Ẓuhr* around noon, *'Aṣr* in the afternoon, *Maġrib* immediately after sundown and *'Išā* at nightfall. Since it is forbidden to pray at dawn, noon or sunset,[11] *Faǧr, Ẓuhr* and *Maġrib* have been shifted slightly. Thus *Faǧr* takes place when it is already daylight but before the appearance of the sun; *Ẓuhr* begins a few minutes be-

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[8] This was the rhythm followed in the monastery of Longobardas on the Greek island of Paros (Cyclades) in May 1964 when I stayed there. I would like to thank Father James Williams, monk of this monastery, who explained the basic elements of the Orthodox ritual and their meaning to me. Today as in 1964 the monks themselves cultivate the monastery's land.

[9] Cf. *Acts*, 3, 1; Wetzer and Welte, *Kirchenlexikon XI*, Freiburg im Breisgau, 1899, col. 1347-1348; S.D. Gotein, *A Mediterranean Society, The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza II: The Community*, Berkeley-Los Angeles-London, 1971, pp. 157-58.

[10] *Matthew*, 20, 1-16.

[11] *The Shorter Encyclopaedia of Islam*, ed. H.A.R. Gibb and J.W. Kramers, Leyden, 1974, pp. 379-80 and 492-93; Edward William Lane, *An Account of the Manners and Customs of the Modern Egyptians, I*, London, 1836, p. 82; Alex Russel, *The Natural History of Aleppo*, 2nd ed. I, London 1794, p. 193 n. 8.

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fore noon (in Aleppo at twenty minutes before noon, which corresponds to five minutes before noon in astronomical time at Mecca) and the *mu'addin* convokes the faithful to the prayers of *Maġrib* only after the sun has disappeared but while its reflection can still be seen in the sky.

Given these modifications, we can observe that the principal difference between Jewish tradition and Islamic tradition is the absence in the latter of a prayer at the third hour. And compared to the Christian rhythm, Islamic rhythm is simpler, as can be seen in the following chart.

Table I

Christianity	Islam
Matins ⎤ …………………………………………………	*Faġr* or *Ṣubh*
Lauds ⎦	
Prime ………………………………………………………	--
Tierce ……………………………………………………	--
Sext ……………………………………………………	*Ẓuhr*
None ……………………………………………………	*'Asr*
Vespers …………………………………………………	*Maġrib*
Compline ………………………………………………	*'Iša*

It can be noted that in Islamic lands there is no prayer during the morning, whereas we find *prime* and *tierce* in the Christian cycle. It is tempting to explain these modifications of foundations, whose origins in Judaism are common to both religions, but the fact is that the Christian rhythm primarily concerned monastic life dedicated to contemplation, whereas the Muslim cycle was born in Arabia where the heat requires inhabitants to work as much as possible before noon since the temperature reaches its zenith around two or three o'clock in the afternoon. Since they worked their own farm land, the Orthodox monks of Paros were in a similar situation and grouped the hours of prayer together in order to leave the morning free for work.

The parable of the vineyard owner mentioned earlier teaches us that he paid his workers by the day; in other words he gave the same amount to all, including those he hired at the eleventh hour, which seemed unjust to workers hired in the early hours

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who felt they should have earned more than the latecomers.[12] The story brings out in this way two systems of remuneration: by the hour and by the day.

In temperate zones winter is a slow period for certain trades. Professor Van der Wee has estimated that in winter in the fifteenth and sixteenth centuries, laborers in the construction trades did not work even half the number of days they were able to achieve in summer.[13] It should also be recalled that the difference between the length of days and nights in summer and winter increases as one approaches the poles. This geographical particularity is reflected in the levels of daily wages. In Antwerp, for example, in the same year and for the same trade, wages were higher in summer than in winter.[14]

In this city, in any case, workers were paid according to the work accomplished. There was less work in winter, and when it could be found, it was paid for at a lower daily wage during the cold and dark season. It is not surprising, then, that winter, with its combination of unemployment and underemployment, was for many a symbol of hardship.

Until the end of the nineteenth century, almost all available time outside of holidays was devoted to work. Twelve-hour days (even more for merchants) were not rare. Thus during the third quarter of the seventeenth century, the day in Berlin began at four or five o'clock and ended fourteen hours later.[15] Around 1890 my grandfather did an apprenticeship with a trader in Assens, a provincial Danish city. Day laborers worked for twelve hours a day, from seven in the morning to seven in the evening, but the establishment remained open until 10 p.m.[16]

Workers' demands gradually established the necessity of dividing the day into three equal parts of eight hours each, set aside

[12] *Matthew* 20, 1-16.
[13] Herman van der Wee, *The Growth of the Antwerp Market and the European Economy (Fourteenth-Sixteenth Centuries)* I, Louvain, 1963, p. 50; in the fifteenth and sixteenth centuries, the maximum was 260 to 270 working days (190-195 in summer and 75-80 in winter), according to information available from Antwerp and Lier.
[14] *Ibid.* I, pp. 336-432 (appendices 27/1-33/2).
[15] Helga Schultz, *Berlin 1650-1800. Sozialgeschichte einer Residenz*, East Berlin, 1987, p. 47.
[16] "Købmand Ejnar Baagøe, Svendborg, fortaeller om sin laeretid hos Plum's i Assens fra 2. sept. 1889-1892", transcription of a recording made in September 1960.

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Periods	Days Paid	Observations (Holidays)
1405 I[a]		
22-29 March	4 ½	Annunciation, 25 March
30 March-5 April	6	
1405 II[b]		
19-25 April	4	Easter, 19 April
26 April-3 May	5	Sts. Philip and James, 1 May
4-10 May	6	
1405 III[c]		
18-24 May	6	
25-31 May	5	Ascension, 28 May
1-6 June	6	
7-14 June	4	Pentecost, 7 June
15-21 June	6	Corpus Christi, 18 June
22-28 June	4	St. John Baptist, 24 June
29 June-11 July	10	Sts. Peter and Paul, 29 June
		Visitation of the Virgin, 2 July
12-18 July	6	
19-24 July	4	St. Mary Magdalene, 22 July
25 July-1 Aug.	6	St. James, 25 July
2-9 August	6	
10-14 August	4	St. Lawrence, 10 August
15-23 August	6	Assumption, 15 August
24-29 August	5	St. Bartholomew, 24 August
30 Aug.-5 Sept.	6	
6-13 September	5	Nativity of the Virgin, 8 September
14-20 September	6	
Total: 163 Days	120 ½ days, or 5.2 days per week	
1406 I[d]		
30 May-5 June	3	Pentecost, 30 May
6-12 June	4 ½	Corpus Christi, 10 June
13-19 June		
20-26 June	4	St. John Baptist, 24 June
27 June-3 July	4	Sts. Peter and Paul, 29 June;
		Visitation of the Virgin, 2 July
4-10 July	6	
1406 II[e]		
12-18 September	5	
19-25 September	5	St. Matthew, 21 September
26 Sept.-2 Oct.	4	St. Michael, 29 September
3-9 October	6	
10-16 October	6	
17-23 October	6	
24-30 October	5	
Total: 91 days	63 ½ days, or 4.9 days per week	

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respectively for work, rest and sleep; but it was ultimately our own century that actually realized this ambition, and has even gone beyond it since in western Europe working time will soon be simply one fourth of a day. In Denmark the work week is now 38 hours in place of the 48 demanded at one time; in West Germany salaried workers in certain sectors give but 35 or 36 hours per week to their jobs, so that work, source of their salary, thus occupies but one fourth of the time in a week.

Old accounting documents that have come down to us from the beginning of the fifteenth century make it possible to calculate the annual number of hours of labor at that time in the construction field. On 10 February 1405 a contract was signed by the city of Bremen, a member of the Hanseatic League, for the construction of its new city hall. Work was completed in February 1407. We have the following figures from this construction (Table II).

This table shows the periods for which the number of days of work is known with certainty. When, for a given week, we found several reports, we always chose the one that indicated the highest number of days, our intention being to establish a maximum number per week. Considering, for example, that when the masons could not work because of bad weather, carpenters could probably work inside, we used figures applying to the latter group. Our table generally shows periods of payment with the number of days worked and the principal holidays. As was normal we have often calculated the number of days worked per week from the amount of wages paid.

For 1405 and 1406 we have five periods in all.

Table III

1405	22 March-5 April	10 ½ days out of 15	5.0 days/week
1405	19 April-10 May	15 days out of 22	4.8 days/week
1405	18 May- 20 Sept.	95 days out of 126	5.3 days/week
1406	30 May-10 July	26 ½ days out of 42	4.4 days/week
1406	12 Sept-30 Oct.	37 days out of 49	5.3 days/week
Average 1405		120 ½ days out of 163	5.2 days/week
Average 1406		63 ½ days out of 91	4.9 days/week

Source: see Table II

As we can see, there are variations depending on the seasons. It is clear that the figures drop during the months of major feast days, such as Easter and Pentecost. On the other hand they increase in summer and autumn. The variations between the years 1405 and 1406 are minimal and can no doubt be explained by meteorological conditions that we do not know. However, we can observe that the average ranges around five work days per week.

As for Antwerp and Lier, it is possible to calculate figures for the period from 1437 to 1600. These are summarized for each decade in table IV below.

Table IV

Periods	Average	Average
1437-1440	208 days/year	4.0 days/week
1441-1450	206 days/year	4.0 days/week
1451-1460	211 days/year	4.0 days/week
1461-1470	204 days/year	3.9 days/week
1471-1480	222 days/year	4.3 days/week
1481-1490	205 days/year	3.9 days/week
1491-1500	203 days/year	3.9 days/week
1501-1510	214 days/year	4.1 days/week
1511-1520	241 days/year	4.6 days/week
1521-1530	221 days/year	4.3 days/week
1531-1540	213 days/year	4.1 days/week
1541-1550	245 days/year	4.7 days/week
1551-1560	251 days/year	4.8 days/week
1561-1570	241 days/year	4.6 days/week
1571-1580	225 days/year	4.3 days/week
1581-1590	216 days/year	4.2 days/week
1591-1600	211 days/year	4.0 days/week

Source: Herman Van der Wee, *The Growth of the Antwerp Market and the European Economy, Fourteenth-Sixteenth Centuries*, I, Louvain, 1963, pp. 540-544, appendix 48 (masons).

We can observe that the average length of the work week for the period considered is four days per week. In times of crisis, this figure falls to 3.7, the minimum reached in 1485-88, 1490-91 and in 1494. The maximum—in 1546-49, 1553-55 and in 1557—is five days per week, reached when the economic and demograph-

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Table V

Work Days per week, Malmö - 1517 and 1519

PERIODS	PAID DAYS	OBSERVATIONS (Holidays)
1517		
19-24 May	4	Ascension, 21 May
25-31 May	5 ½	Pentecost, 31 May
1-7 June	1 ½	
8-14 June	4	Corpus Christi, 11 June
15-21 June	4	
22-28 June	4	St. John Baptist, 24 June
29 June-5 July	3	Sts. Peter and Paul, 29 June
		Visitation of the Virgin, 2 July
6-12 July	5	
13-19 July	6	
20-26 July	3	St. Mary Magdalene, 22 July;
		St. James, 25 July
27 July-2 August	4	
3-9 August	5 ½	
10-11 August	1	St. Lawrence, 10 August
Total: 85 days	**50 ½ days, 4.2 days per week**	
1519		
7-19 June	5	Pentecost, 12 June
20-26 June	2	Corpus Christi, 23 June;
		St. John Baptist, 24 June
27 June-3 July	3	Sts. Peter and Paul, 29 June;
		Visitation of the Virgin, 2 July
4-10 July	4	
12-14 August	2	
15-21 August	5	Assumption, 15 August
22-28 August	5	St. Bartholomew, 24 August
29 Aug.-4 Sept.	5	
5-11 September	2	Nativity of the Virgin, 8 September
Total: 65 days	**33 days or 3.6 days per week**	

Source: Leif Linngberg, ed., *Lyder van Fredens Kämnärsräkenskaper för Malmö 1517-1522*. Malmö 1960, pp. 62-72 and 153-160.

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ic power of Antwerp was at its peak[17] and an entire section of
the city, the *Nieuwstad*, was being constructed under the direc-
tion of Gilbert van Schoonbeke (died in December 1556).[18] The
number of work days per week obviously depended on econom-
ic health of the construction trade; for example the decade from
1566 to 1575 was a slow period as seen by the flagging rents and
salaries for masons, carpenters and sawyers.[19] Nevertheless, the
average number of work days did not drop below 4.3 days per
week (1570-72). The effects of the economic situation seem to
have made themselves felt indirectly.

In Lyons, a bridge was built over the Rhone in 1501-02. Richard
Gascon calculated that work on the bridge took place a maxi-
mum of 260 to 265 days per year, which corresponds to 5.0-5.1
days per week.[20]

Returning to the north, in Malmö (at that time a Danish city
although today Swedish), located on the Sund, at the beginning

Table VI

Periods	Days Paid	Averages
1517: 19 May-11 August	50 ½ days out of 85	4.2 days/week
1519: 7 June-10 July	14 days out of 34	2.9 days/week
1519: 12 Aug.-11 Sept.	19 days out of 31	4.3 days/week
Average 1517	50 ½ days out of 85	4.2 days/week
Average 1519	33 days out of 68	3.6 days/week

Source: see Table V

[17] The city seems to have reached its demographic maximum of 90,000 inhabi-
tants between 1557 and 1564; see Thomas Riis, "Some types of towns in the 14th-16th
century Netherlands", *The Rhine-Meuse-Scheldt Delta: Historical Perspectives,
Present Situation and Future Prospects*, ed. P.W. Klein and J.H.P. Paelinck, Rot-
terdam 1979, p. 27.
[18] H. Soly, "De Brouwerijenonderneming van Gilbert van Schoonbeke
(1552-1562), *Revue belge de philologie et d'histoire*, XLVI, 1968, pp. 1166 and 1201.
[19] Van der Wee, *op. cit.*, p. 462: E. Scholliers, "Un indice du loyer. Les loyers
anversois de 1500 à 1873", *Studi in onore di Amintore Fanfani* V, Milan 1962, pp.
605 and 611.
[20] Richard Gascon, "Économie et pauvreté aux XVIe et XVIIe siècles: Lyon, ville
exemplaire et prophétique", *Études sur l'histoire de la pauvreté* II, ed. M. Mollat,
Paris, 1974, p. 749.

of the sixteenth century a part of the urban fortifications and the house of the Holy Spirit were being constructed. Figures preserved in the municipal archives for the years 1517 and 1519 make it possible to use the method already explained earlier to calculate the number of work days per week. (Table V).

In 1518 work was limited to small repairs whereas in 1517 and 1519 the actual work of construction was in progress. We are interested, then, in these two years especially; for 1517 and 1519 we have three periods in all:

Just as we have already seen in Bremen, the major holidays, namely Pentecost, had a direct influence on the number of work days. We also note that the figures for Malmö are comparable to those of Antwerp but less than those for Bremen.

Let us leave western Europe for a moment to examine working conditions on the Bosphorus. The construction of the mosque of Suleiman in Istanbul gave rise to an abundance of accounting records, which have been studied by O.J. Barkan. Using a sampling of 3,523 workers, Barkan observed that 1,810 (51.4%) of them were Christians and 1,713 (48.6%) were Muslims.[21] For the months of April-August 1555, he gives the number of laborers employed daily, which makes it possible for us to estimate the number of work days per week.

Naturally Friday was the day of rest for Muslims and Sunday for the Christians. Nevertheless, there was not a noticeable decrease in the number of workers present on Sunday. Since the masons were 83% Christian, Barkan detects a certain absenteeism on Sunday,[22] but this is always less than 20% except for 14, 15 and 16 April, which was Easter in 1555, and 30 June of the same year. Using as reference the maximum number presumably present for the day workers were paid, Thursday, we arrive at the following figures (table VII) for workers present on Sundays for the period 14 April-25 August (excluding 6-8 April, 23 and 27 June, 16-22 August, days with generally few workers as we will explain shortly).

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[21] O. Lutfi Barkan, "L'organisation du travail dans le chantier d'une grande mosquée à Istanbul au XVIe siècle", *Annales. Économies - Sociétés - Civilisations* XVII, 1962, pp. 1103-1105.
[22] *Ibid.*, p. 1101.

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Table VII

14-15 April	289 masons present out of 622	46,5%
16 April	261 masons present out of 622	42,0%
21 April	690 masons present out of 697	99,0%
28 April	743 masons present out of 756	98,3%
5 May	717 masons present out of 815	87,8%
12 May	698 masons present out of 792	88,1%
19 May	684 masons present out of 810	84,4%
26 May	733 masons present out of 800	91,6%
2 June	686 masons present out of 802	85,5%
9 June	677 masons present out of 806	84,0%
16 June	683 masons present out of 814	83,9%
30 June	675 masons present out of 871	77,5%
7 July	761 masons present out of 850	89,5%
14 July	765 masons present out of 859	89,1%
21 July	741 masons present out of 850	87,2%
28 July	713 masons present out of 851	83,8%
4 August	796 masons present out of 846	94,1%
11 August	812 masons present out of 870	93,3%
25 August[a]	713 masons present out of 885	80,6%

Source: O.L. Barkan, ''L'organisation du travail'', table I;
a) last day before Ramaḍān

We might think that the high number of laborers working on Sunday came from the fact that Christians did not have the right to attend mass. This is very unlikely. Even though a minority within the population, they were sufficient in number for their region to have been recognized by the Sublime Gate, which, let it be said in passing, granted freedom of worship to its subjects more readily than did other Western governments of the period. Just as the Muslims interrupted their work at the time of prayers on ordinary days, it is perfectly reasonable to suppose that Christian workers were permitted to be absent for an hour or two on Sunday in order to attend mass. As seen in Table VIII, it was only upon the occasion of Easter that Christians were missing from work in large numbers.

Of the 153 days from 1 April to 31 August 1555, we can count 36 days in which there was an important reduction in the number of workers on the sites.

Table VIII

Number of days not worked between 1 April and 31 August 1555

6-8 April	3 days	
14-16 April	3 days	Easter, 14 April
23 June	1 day	
27 June	1 day	
16-22 August	7 days	Ramaḍan (*Kücük-Bairam*, or *'Id al-Fiṭr*)
Fridays[a]		
5, 12, 19, 26 April	4 days	
3, 10, 17, 24, 31 May ..	5 days	
7, 14, 21, 28 June	4 days	
5, 12, 19, 26 July	4 days	
2, 9, 23, 30 August	4 days	
TOTAL	36 days	

Source: Barkan, ''L'organisation du travail'', chart No. 2 and table I.
a) apart from days of reduced activity

Since there are 153 days between 1 April and 31 August, we count a total of 117 work days out of 153 or 5.3 days per week.

For the period after the sixteenth century, we have found only several examples of interest. But we are convinced that the archives in most cities contain documents, particularly accounting papers, that could allow us to calculate the number of days worked per week over a given period of time.

In Copenhagen for an entire year, from 2 February 1607 to 1 February 1608, carpenters working for the Navy worked 297.5 days or a weekly average of 5.7 days.[23]

The accounting records (*Shore Work Accounts*) for the port of Aberdeen in Scotland likewise reveal a high number of working days. Documents relative to 1699, the year in which a new breakwater was constructed, show the exact amount of wages paid to carriers of sand and stones for the period from 23 May to 19 September. The normal salary paid these men was 6 Scottish shill-

[23] RA (Rigsarkivet) Copenhagen: *Bilag til Rentemesterregnskaber udgiftskonto Fa: Klaededammerregnskab 1607-1608*, fol. 78 r. - 88 v.

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ings and 8 pence per day, but it was sometimes less when they only worked for part of the day. In the course of the period under consideration, apart from Sundays there was but one holiday, 7 August; they even worked on the Monday after Pentecost.[24]

The following year work resumed from 11 March until 14 September. The base salary for an unskilled laborer was still 6 Scottish shillings and 8 pence per day; for March we can note a decrease in wages paid, probably due to the fact that there was less work in this period than in the summertime. With the exception of 24 March, holidays were above all Sundays; Monday 25 March was a holiday, but not Easter Monday, Pentecost Monday or Ascension day.

For a part of the period in question, we know the weekly wages of three masons and the number of days they worked. Their salary was one Scottish pound per day, and they worked as much as the laborers in the same period, except from 14-19 July when two of the masons only worked three and a half days and the other two and a half days.[25] We see that the average number of work days per week was quite high in Aberdeen, six days for 1699 and 5.9 for 1700 (Table IX).

In Berlin a journeyman shoemaker could produce a pair of shoes in one day; figures for his weekly salary show us that theoretically there were six days in the work week (late seventeenth-early eighteenth centuries).[26] In the textile industry at the time of Friedrich Wilhelm I (1713-1740) it has been calculated that the daily net wages for a weaver were only 4 groschens, which would equal an annual (net) salary of 50 thalers at the most.[27] Knowing that 1 thaler equals 24 groschens, we can calculate that the maximum annual number of days worked was 300, or 5.8 days per week.

These various figures can be summarized in the following table.

We do not underestimate the fact that working conditions could vary depending on the situations. There were work sites that were better managed than others, weather conditions could be more

[24] Aberdeen City Archives, *Shore Work Accounts* 1698 29/9-1699 29/9.
[25] *Ibid.* 1699 29/9-1700 29/9.
[26] Helga Schultz, *op. cit.*, p. 214.
[27] *Ibid.*, p. 151.

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Table IX

Work days per week, Aberdeen 1699-1700

Periods	Days Paid	Observations (Holidays)
1699[a]		
23-28 May	5	Pentecost, 28 May
29 May-6 August	60	Ten weeks, each with six work days
7-13 August	5	Holiday, 7 August
14 August-17 Sept.	30	Five weeks, each with six work days
18-19 Sept.	2	
1700[b]		
11-17 March	6	
18-25 March	7	Palm Sunday, 24 March, workday; holiday on 25 March
26-31 March	5	Easter, 31 March
1-7 April	5	Holiday, 3 April
8-28 April	18	Three weeks, each with six work days
29 April-5 May	5	Holiday, 2 May
6-12 May	6	Ascension, 9 May
13-19 May	6	Pentecost
20-26 May	6	
27 May-14 July	42	Seven weeks, each with six work days
15-21 July	5	Holiday, 20 July; Alexander Kemp and Patrick Johnstone were paid for 3 half days on 19 July, William Mill for 2 ½ days.
22 July-25 August	30	Five weeks, each with six work days
26 Aug.-1 Sept.	6	Holiday, 29 August
2-8 September	6	
9-14 September	6	
Average 1699	102 days out of 120	6.0 days/week
Average 1700	158 days out of 187	5.9 days/week

Source: Aberdeen City Archives, *Shore Work Accounts*, 1698 (29/9) - 1700 (29/9).
a) unskilled laborers; *b*) skilled laborers from 11 March to 14 September, masons from 18 March (Alexander Kemp) or from 15 April (Patrick Johnstone, William Mill) until 14 September.

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Table X

Bremen	1405-1406	4.9-5.2 days/week
Antwerp/Lier	1437-1600	3.7-5.0 days/week
Lyons	1501-1502	5.0-5.1 days/week
Malmö	1517-1519	3.6-4.2 days/week
İstanbul	1555	5.3 days/week
Copenhagen	1607-1608	5.7 days/week
Aberdeen	1699-1700	5.9-6.0 days/week
Berlin	1700-1750	5.8 days/week
Copenhagen[28]	1990	4.8 days/week

or less suitable for construction trades, the number of work days might be greater or lesser depending on the urgency of the task to be completed. Naturally it follows that there are a certain number of errors that cannot be overlooked but that have no effect on the general trend clearly discernible from the examples studied. At the beginning of the fifteenth century, the number of work days per week was relatively high, but it dropped rapidly before stabilizing for the rest of the fifteenth century and first half of the sixteenth (the high figure found in Lyons in 1501-1502 probably is a result of local working conditions and particular traditions). An upward trend is visible by the middle of the sixteenth century, culminating in the seventeenth and eighteenth centuries.

With regard to Antwerp, it should be pointed out that after reaching a maximum, the number of work days began to diminish in the second half of the sixteenth century. The phenomenon can be explained by the political and religious events taking place in the city at that time; but even during the most troubled period—roughly between 1575 and 1590—there were more working days than in the middle of the fifteenth century.

Demonstration of the trend will perhaps be more evident if we recall that the first four examples we gave come from Catholic regions (at least at that time), and the last five from Protestant cities and a Muslim city. The increase noted in the seventeenth and eighteenth centuries can no doubt be attributed to the elimination of saints days in the Protestant churches. The example of Istanbul lies in an intermediate position; even though Islam

[28] According to the calendar for this year, the number of work days was 25.

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can be compared to Protestant churches in terms of the number of religious holidays, the mixed nature of the labor force at the Suleiman mosque construction site led to observance of both Muslim and Orthodox holidays, with a decrease in weekly activity as a result.

The decrease in the amount of time devoted to work in the fifteenth century has never before been sufficiently explained, and the problem remains to be solved. We would attempt to propose the following hypothesis.

It is well known that the black death plague of 1348 and the Reformation in the middle of the sixteenth century represent major events in the spiritual history of Christianity. The period between these two events has been well examined by Jan Huizinga,[29] and he has shown how there were outbreaks of collective fear upon several occasions during this period. Twentieth century man is in a very good position to understand this fear, for the nuclear threat represents for many of us a possibility even more terrifying than was the plague in its time.

However, the responses given in each case are different. The use of modern arms presupposes a political choice, and it is possible to bring pressure to bear on those in power. It was more difficult to demonstrate against the plague; but we do find, all over medieval Europe, frescoes and sculptures that are testimony to the fear it provoked. One theme recurs incessantly, the obsession with triumphant death, personalized in the *Totentanz*, and a single message can be read in the various representations made of it: no man, no matter what his state or his wealth, can escape from death.

Hell and purgatory were naturally threats that were equally present in the minds of the time, and since one could never be sure to have done enough to guarantee one's salvation, new means were invoked to intercede with the powers of the beyond. Votive masses, forms of piety of all sorts (in Denmark in the fifteenth century, the *angelus* was still considered a Roman devotion) and especially new saints days suddenly multiplied, and the time devot-

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[29] J. Huizinga, *L'Automne du Moyen Age*, Paris, Payot, Petite Bibliothèque Payot, 1989 (translated from the Dutch).

ed to these celebrations can explain the decline in work time that we have detected in the fifteenth century.

If such a hypothesis could be proven, it would also be of interest for research into the history of capitalism.

Several reasons have been advanced for the development of capitalism, such as the shift of Europe's center of gravity from the Mediterranean to the English Channel and the North Sea, already underway when the Reformation broke out, or the presence in Puritan thinking of characteristics favorable to economic development. But we can also suppose that the sudden suppression of saints days by the Reformation, with 15 to 20% more time available for working, must have had considerable consequences on growth of the economy.

A religious event, the arrival of Protestantism, increased the length of time worked; a secular event, the Welfare State, has reduced work time back to what it was before the Reformation, with dayly working hours reduced as well. It is not impossible that new ideas, coming perhaps from the Far East, will one day aid the West in reconciling its rediscovered traditional values with the success of its economy.

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