THE CHANGING OF CONCEPTION OF TIME: CALENDAR AND CLOCK FROM THE OTTOMAN EMPIRE TO THE REPUBLIC OF TURKEY

by

Bekir Cantemir

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ABSTRACT

An Abstract of the thesis of Bekir Cantemir for the degree of Master of Arts in the Atatürk Institute for Modern Turkish History to be taken

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Title: The Changing of Conception of Time: Calendar and Clock from the Ottoman Empire to the Republic of Turkey

This thesis explores the changing conception of time and the time measurable tools and its symbologies from the Ottoman Empire to the Republic of Turkey. My aim is to describe the Ottoman and Republican experiences on the issue of time and compare these with the European experience.

In the Ottoman Empire, from the fifteenth century on, the calendars were prepared by the palace *müneccims*, or astronomers. The *Hicri* calendar was used at the officially level until the end of the Empire; however, at end of the eighteenth century, the *Rumi* calendar was introduced as the *Hicri* calendar was not connected to the seasons. Apart from this, the hour system was used *ezani* (*alaturka*) until the modernization period; then the hour system began to change. These alterations caused some dichotomies in social life. In the Republican period, time was adapted to the Western standards.

The modernization and secularization of time in the Ottoman era resembled that of Europe in its early modernization phase. The constituting of the time symbologies and the time disciplines differed according to societies. It was realized that time could aid in the secularization and modernization of society by the power. From this point of view, this paper seeks to establish methodological roots for the conception of time and its effects of secularization and modernization.

Atatürk İlkeleri ve İnkılap Tarihi Enstitüsü'nde yüksek lisans derecesi için Bekir Cantemir tarafından Ağustos 2004'te teslim edilen tezin kısa özeti

ÖZET

Başlık: Zaman Kavramının Değişimi: Osmanlı İmparatorluğu'ndan Türkiye Cumhuriyeti'ne Takvim ve Saat

Bu yüksek lisans tezi Osmanlı İmparatorluğu'ndan Türkiye Cumhuriyeti'ne zaman kavramının zamanı ölçme araçlarının ve sembollerinin değişimini ele almaktadır. Zaman kavramı konusundaki Osmanlı ve Cumhuriyet deneyimleri Avrupa deneyimi ile karşılaştırmalı olarak ele alınacaktır. On beşinci yüzyıldan sonra, Osmanlı İmparatorluğu'nda takvimler saray müneccimleri tarafından hazırlanmıştır. İmparatorluğun yıkılışına kadar, Hicri takvim resmi takvim olarak kullanılmış, on sekizinci yüzyılın sonunda da Hicri takvim mevsimlere uyumlu olmadığından Rumi takvim kullanılmaya başlanmıştır. Modernleşme dönemine kadar ezani (alaturka) saat sistemi kullanılmış, sonrasında saat sistemi değişmeye başlamıştır. Bu değişimler sosyal hayatta bazı çift başlılıklara neden olmuştur. Cumhuriyet'le birlikte zaman sistemi Batı ile uyumlu hale getirilmiştir.

Osmanlı döneminde zamanın modernleşmesi ve sekülerleşmesi, erken dönem Avrupa'da yaşanan tecrübeye benzemektedir. Zaman sembollerinin ve zaman disiplinin oluşması toplumlara göre değişiklik arz eder. İktidarlar, zamanın, sekülerleşme ve modernleşmeye yardını edeceğini düşünmüşlerdir. Bu noktadan ele alındığında, bu tez zaman kavramının metodolojik köklerini, onun sekülerleştirici ve modernleştirici etkisini inceleyecektir.

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to my wife and my daughter

CONTENTS

PREFACE

This thesis describes the changing of time conception and its measurement methods from the Ottoman Empire to the Republic of Turkey. Moreover, the data from this process is compared with data on the European experience.

I became to interested in time conception in the Ottoman Empire as an undergraduate student at Yıldız Teknik Universitesi. I saw a gnomon at the Mihrimah Sultan Camii in Usküdar in 1998. I was curious about what it was and what it was used for, but could not find any information about it. In 2000, at a book discussion, the sociologist Vahdettin Işık explained the difference in time conception between the traditional and the modern from the sociological perspective. While attending Enlightenment conferences led by Abdurrahman Arslan, an intellectual who attended Alternative University seminars in 2001, I began to grasp the modernization and secularization of time conception in the West and its difference from the traditional time conception. Apart from these, one day in class at the Atatürk Institute, Professor Zafer Toprak described the changing of the hour system from *alaturka* to *alafranga*. I decided to make the changing of time conception in the Empire the subject of my thesis.

When I began to research the Ottoman time measurement system, I could find little data about it. There is no book that addressed the issue of time in the Ottoman era specifically. Entries in encyclopedias were either wrong or incomplete. One day in the library, I located an article about the hour system in the Ottoman Empire written by A. Necati Akgür. I found his other articles in its bibliography. Through an interview with Akgür, I reached data that was written in Ottoman. The primary sources provide information on the calendar and hour system in the Ottoman Empire.

I discovered books written by intellectuals at the turn of the twentieth century on this issue. Most of the materials are still in Ottoman. I plan to translate some important discussions about the calendar and hour system.

I encountered some problems in researching the *muvakkithanes*. On this issue, there are few articles although these establishments had an important place in Ottoman daily life. A. Süheyl Ünver wrote an article, and others based their arguments on this article, but there is little else on the social role of the *muvakkithanes*.

One of the major problems I encountered was that most of the sources are concealed in details. I gathered as much information as I could, although I suspect much remains to be located. Another challenge was the development of the methodological roots of the thesis, because time conception is evaluated as a physical or philosophical issue related to space. The evaluations of Nobert Elias, Evitar Zerubavel, Gerhard Dohrn-Van Rossum, and Arno Borst broadened my view on sociological roots, its relations with daily life, and the comparison of the process of change in Europe with that in the Empire.

The study of the changing of time conception can supply more data about Ottoman social life and the Ottoman people's mentality of daily life. With the modernization of the Empire, the governmental organizations and the elites adopted new working and living styles. Their perception of time gives information about their mentalities and their views on the modernization. The secularization of society can be seen in the perception of time and its application in daily life.

With the Republican era, the westernization mentality can be observed in the time policy of the state. The Kemalist westernization was based on the acceptance of the western style of life in all dimensions.

Time measurement and its symbologies were constituted according to social need and social symbology. The universal calendar in use today is a Christian calendar that was reformed by Pope Gregory give year. In Europe, its acceptance period took over three hundred years. Therefore, criticizing the awkward transition to the present calendar in the Empire is an anachronism caused by today's views. Every traditional society had its symbols and way of life after modernization and the globalization of the world.

The paper opens with the introduction, which discusses the philosophical dimension of time and the secularization and modernization period in Europe.

Chapter Two describes the traditional calendar in the Ottoman Empire, its principles and its usage. Chapter Three clarifies the reformation of the calendar in the Republican era, and the acceptance period of the Gregorian calendar in the world. This chapter also explains month names, their original roots, and how they changed over time.

Chapter Four turns to the hour systems and their differences from each other. The usage of the *ezani* hour system and its changing period will be explained in those pages. Apart from this, the *muvakkithane* and its place in society will be clarified. The last chapter contains the meaning of the time conception in Ottoman society and the process of its alteration with modernization.

In short, in writing this thesis, I fought with the methodological framework, the time symbology and its usage in society. After completing this thesis, the next step will be to develop a comprehensive history of the time measurement systems, their improvement periods, and changes in the meaning of time from the Ottoman to the Republican periods. The alteration of the conception of time and its social meaning in the Ottoman and the Republican era can add dimensions to the time discipline in our

society. With respect to social history, time is one of the most significant elements supplying valuable data on social mentality and the lives of the ordinary people. The aim of this thesis is to open a window the time conception and its effects and place on social life.

CHAPTER I

INTRODUCTION

This thesis examines the changing of the conception of time and its measurement systems from the Ottoman Empire to the first decades of the Republic of Turkey. The change in time conception is asserted within the context of modernization and secularization. First, the differences between religious and secular time conceptions are discussed and it is argued that the change in the concept of time from the Ottoman Empire to the Republic of Turkey resembled that gone through by countries in the west.

This transformation emerged from the difference of knowledge between the sacred and the secular. Knowledge was secularized in the process dividing the sacred and the profane. To the modern tendency to reconsider and reconstitute the mode of knowledge, Foucault proposes the word, knowledge (*savoir*), which had a more general and broad sense and perspective than it had in the past. Foucault defines knowledge as

> this group of elements, formed in a regular manner by a discursive practice, and which are indispensable to the constitution of a science, although they are not necessarily destined to give rise to one, can be called knowledge... Knowledge is also the space in which the subject may take up a position and speak of the objects with which he deals in his discourse... Knowledge is also subordination of statements in which concepts appear, and are defined, applied and transformed.[1]

The activity which treats such knowledge is called archaeology. "Instead of exploring the consciousness/knowledge (*connaissance*)/science axis (which cannot escape subjectivity), archaeology explores the discursive practice/knowledge

[1] Michel Foucault. *The Archaeology of Knowledge*, trans. A.M. Sheridan Smith (London: Tavistock Publications, 1974), pp. 182-183.

(*savoir*) science axis."[2] Thus, knowledge is not a science, but the sciences in general are essentially regulated by knowledge (*savoir*) in archaeology.

Foucault further says that, "knowledge is not an epistemological site that disappears in the science that supersedes it. Science (or what is offered as such) is localized in a field of knowledge and plays a role in it."[3] The world is divided into pieces epistemologically with only the criterion of the scientific. He maintains that, "if one recognizes in science only the linear accumulation of truths or the orthogenesis of reason, and fails to recognize in it a discursive practice that has its own levels, its own thresholds, its own various ruptures, one can describe only a single historical division, which one adopts as a model to be applied at all times and for all forms of knowledge: a division between what is definitively or what is not yet scientific."[4] Thus, science is relativized and given its boundary in knowledge. The "episteme" is discussed by Foucault: "the orientation towards the episteme has been the only one to be explored so far. The reason for this is that, because of a gradient that no doubt characterizes our cultures, discursive formations are constantly becoming epistemologized."[5]

Time systems can be analyzed according to their cultural roots and their transformation from the natural and religious dimension to that of imaginative and secular. In Europe, by the end of the fourteenth century, time had become an abstract concept and people had begun to use it as an economic item.

This thesis presents data collected on time, the methods used to determine time, and its effect on life from the Ottoman Empire to the first decades of the Republic of Turkey. The time determining systems and their role, at the official

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[2] Ibid., p. 183.
[3] Ibid., p. 184.
[4] Ibid., p. 188.
[5] Ibid., p. 195.

level, on the daily experiences of the state and the people are discussed, and are compared these to how people in the west underwent this transformation. As all cultures in the world are actively interrelated and interpenetrating, both synchronically and diachronically, a comparison gives insights into how different cultures have made the change in time keeping mechanisms.

Circular Time and Linear Time

Since the beginning of recorded history, man has conceptualized time as either circular and linear. Circular time is a system in which time comes back to the beginning point at end of the cycle. This type of time conception was present in ancient Greek, and within that, there were two other types time: sacred cosmological time, according to which the Gods lived; and profane time, according to which humans lived. Whitrow quotes from Nemesius, the fourth-century bishop of Emesa, who said that,

> The Stoics say that when the planets return, at certain fixed periods of time, to the same relative positions which they had at the beginning, when the cosmos was first constituted, this produces the conflagration and destruction of everything which exist. Then again the cosmos is restored anew in a precisely similar arrangement as before. The stars again move in their orbits, each performing its revolution in the former period, without variation.
>
> The Stoics even believed that Socrates and Plato and each individual man will live again, with the same friends and fellow-citizens. They will go through the same experiences and the same activities. Every city and village and field will be restored, just as it was. And this restoration of the universe takes places not once, but over and over again – indeed to all eternity, without end. Those of gods, who are not subject to destruction, having observed the course of one period, know from this everything which is going to happen in all subsequent periods. For there will

> never be any new thing other than that which has been before down to the minutes detail.[6]

The general outlook of the Greeks in natural philosophy was dominated by the idea of the permanence of the cosmos. Whitrow writes that, "they thought of time in this context they associated it with the regular alteration of things not with concepts of progress and perpetual transformation. Even their idea of memory differed sharply from ours. They believed that through memory we do not try to grasp the past, but rather we seize an eternal and divine truth."[7]

> Unlike profane time, which is historical and proceeds in a linear fashion, sacred time is essentially ahistorical and is best represented by the circular manner. Eliade writes that, religious man experiences two kinds of time: profane and sacred. The one is an evanescent duration, the other a "succession of eternities," periodically recoverable during the festivals that made up the sacred calendar. The liturgical time of the calendar flows in a closed circle[8]... Sacred time, appears under the paradoxical aspect of a circular time, reversible and recoverable, a sort of eternal mythical present that is periodically reintegrated by means of rites... sacred time is indefinitely recoverable, indefinitely repeatable.[9]

According to Eliade, religious people experience time in both the circular and linear conceptions. Zeraubavel writes that,

> I would like challenge the traditional view according to which cyclical temporality its characteristic of traditional societies alone while linear temporality is an exclusively modern phenomenon. Rather, I would like to contend that both modalities of temporality can and do exist -albeit in varying proportions- within one and the same society or culture.[10]

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[6] G.J. Whitrow. *What is Time?* (London: Thames and Hudson Ltd, 1972), p. 15.
[7] G.J. Whitrow. "Reflections on the History of the Concept of Time," *The Study of Time – Proceedings of the First Conference of the International Society for the Study of Time*, J.T. Fraser, F.C. Haber, G.H. Müller (New York: Springer-Verlag, 1972), p. 4.
[8] Mircea Eliade. *The Sacred and the Profane* (New York: Harcourt, Brace & World, 1959), p. 104.
[9] Ibid., pp. 69-70.
[10] Evitar Zerubavel. *Hidden Rhythms* (Chicago: University of Chicago Press, 1981), p. 113.

In religious societies, time is circular, rotating in short periods. Lniear thinking comes in with longer periods; however, it is not linear in the evolutionary understanding of the term.

In linear time, events unfold as if in a line. Judaism and Christianity view time as linear, beginning with the creation by God and ending with the apocolypse. With the Copernican system, the debate over the nature of time took on new implications. Daniel writes of this shift that, "Copernicus provided an alternative cosmology to that found in the Aristotelian-scholastic treatment of time."[11]

Throughout the medieval period, the circular and linear concepts of time were in conflict. Scientist and scholars, influenced by astronomy and astrology, tended to emphasize the cyircular concept. Whitrow writes that,

> the linear concept was fostered by the mercantile class and the rise of money economy. For as long as power was concentrated in ownership of land, time was felt to be plentiful and was associated with the unchanging cycle of the soil. But with the circulation of money and emphasis was on mobility. The tempo of life was increased, and time was now regarded as something valuable that was felt to be slipping away continual.[12]

Men began to believe that "time is money," and argued that it must be used economically. Thus time came to be associated with the idea of linear progress.

During the Enlightenment period, while time was still linear, it no longer was centered on God's action. It progressed according to man's clocks and calendars. The idea of progress presupposes, *a priori*, a linear conception of time. In different ways, as Sorokin writes, the linear variable of time, seen as "flowing" in a single direction, became a basic factor in Western man's concept of reality. His "sense of things" conceived of events as pinned to points in a line, according to a Euclidian

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[11] Stephen H. Daniel. "Seventeenth-Century Scholastic Treatments of Time," *Journal of the History of Ideas* 42, no.4 (October-December 1981), p. 589.
[12] Whitrow, *What is Time?*, p. 18.

perspective, points which could be plotted on a fixed time-coordinate.[13] With the homogeneity of time, holy days, and auspicious and inauspicious secular days became part of modern ordinary time.

Mathematical time began to coexist alongside theological time in historical thought. Mathematical time was used to establish the chronology of actual historical events, but theological time set the pattern in which events had their temporal existence. According to the religions, God had created the world for a purpose and according to a plan that would unfold and reach completion in a preordained span of time; the time of history was thus transcendental and theological.

Pomian identifies three ways in which time is made visible: chronometry, chronology, and chronosophy. He writes these that,

> chronometry represents time by the marks on calendar and instruments. Chronology does it by tables, series of dates and names which show the progression of events from an original point until the present moment. As for chronosophy, it speaks of time; it makes time the object of a discourse or rather of discourse in general. These three ways of translating time into signs differ on several accounts.[14]
>
> Chronometric time can only be cyclical... These constitute a necessary and sufficient condition for measuring time. Everyday life, most especially in the domain of utilitarian activities, as is true for the knowledge which in part or as a whole remains at the service of these activities, determines the location where the notion of cyclical time inevitably appears and where it finds its application.[15]... Chronology is not cyclical but linear, and to translate it into signs, one must observe not natural phenomena but the actions of men, of certain men. The linearization of time effectuated by chronology could not have been based on the study of natural phenomena, since linear processes were not discovered in nature until the second half of the nineteenth century. In short, it is authorities who introduce the linearization of time; more precisely, a non-cumulative linearization.[16]... Chronosophies are always produced by the holders of knowledge, who cannot avoid

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[13] Pitirim A. Sorokin, *Social and Cultural Dynamics*, 4, (New York: 1937-1941), p. 10.
[14] Krzysztof Pomian, "The Secular Evolution of the Concept of Cycles," *Review –A Journal of the Fernand Braudel Center for the Study of Economies, Historical Systems, and Civilizations* 2, no.4, (Spring 1979), pp. 568-9.
[15] Ibid., p. 569.
[16] Ibid., p. 570.

the question of the relation between the present, the past, and the future.[17]

Chronological time is linear, profane, and cumulative; one year is followed by the next. This time is historical time and is that upon which modern historical thinking is based.

In addition to the dichotomy between circular and linear time is one between sacred and secular time. The first, sacred time, is not worldly time and is experienced by humans in prayer or meditation. In ancient Greece, as the gods lived in this time, the humans could not relate to this conception. In Judaism and Christianity, for ordinary people, sacred time is only at prayer time. In Christianity, priests live in monasteries according to sacred time. In Islam, in contrast, every moment is sacred, whether people are at work, at war or in prayer. As there is no sacred time, there is no secular time.

Secular time describes the events that pertain to our worldly, everyday experiences. Mohavedi writes that "secular time is an arbitrary and abstract system of measurement that is based on impersonal, universal, and interchangeable units."[18] Secular time is industrial time, clock time. It is operational concept time.

The secular concept of time evolved in connection with economic development. In this process, time came to be viewed as a medium of economic or productive activities. Mohavedi says, "defined economically, time is a valuable commodity which can be bought, sold, spent, borrowed, spared, wasted, and saved; this kind of time can also be scarce or abundant."[19]

The difference between modern industrialized and traditional agrarian societies in terms of the value accorded to time is said to be a function of its scarcity

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[17] Ibid., p. 571.
[18] Siamak Mohavedi. "Cultural Perceptions of Time: Can We Use Operational Time to Meddle in God's Time," *Comparative Studies in Society and History* 27, no.3 (July 1985), p. 387.
[19] Mohavedi, p. 387

or abundance.[20] In traditional societies, time does not have an economic value. The members of these societies are said to posses plenty of time as compared to the harassed individuals of industrialized societies.

Sacred time and secular time are divided into two categories, according to their daily characters. There are two sharply different systems of truth and reality. One system represents the paradigm of relativism, temporalism, and empiricism, while the other represents the paradigm of absolutism, exernalism, and faith. The former is in the realm of the profane and the later in the realm of the sacred.[21]

Zerubavel also divides time into two categories, sacred and profane, and writes that these two categories stem from culture. He says that, "the fundamental difference between sacred time and profane time results from the fact that, from a cultural standpoint, they are essentially considered to 'belong' on two different planes -and are even represented by two entirely different modalities- of temporality."[22] Profane time is historical and linear, sacred time is ahistorical and circular.

The Concept of Time

What is the time? Is it object of nature? Is it part of the events of nature? Or is it an object of culture? What does a clock show when we say that it shows the time? Nobert Elias writes that to understand the conception of time,[23] instead of

[20] H. Nowontny. "Time Structuring and Time Measurement: On the Interrelation between Time Keepers and Social Time," *The Study of Time II*, J.T. Fraser and N. Lawrence, (New York: Springer-Verlag, 1975), p. 327.
[21] Mohavedi, p. 397.
[22] Zerubavel, *Hidden Rhythms*, p. 112.
[23] Nobert Elias. *Zaman Üzerine* Trans. Veysel Atayman (İstanbul: Ayrıntı Yayınları, 2000), p. 25.

separating nature and the human, the human should be considered in nature.[24] If we distinguish and chart the progress of a modern type of a time, we see four main dimension of time: linear, secular, quantifiable, and divisible. Moran says that, "in its struggle to banish traditional time from our collective mentalities and in Febvre's words, 'force all of us to get a watch.'"[25]

Time puts order between the individual and society,[26] meaning social pressure causes the consciousness of time and coordinates and unifies societies. In ancient societies, time structures were heterogeneous. When people began to feel cold, for example, they knew winter was approaching. The center of the time measurement activity was nature. With the development of technology, man became its center,[27] and by establishing temporal references to social events.

In rural societies, time continued to be measured by natural events: daybreak, sunrise, high noon, sunset, darkness. With industrialization, time became abstract thing; that is, people who live in the modern period have lost their interest in astronomy to determine the time and instead learn it by means of calendars that are prepared for each year.

With the change in the conception of time, a sensitivity developed to its accurate measurement. Standard time is thus among the most essential coordinates of intersubjective reality, one of the major parameters of the social world. Zarubavel writes that, "social life would probably not have been possible at all was it not for our ability to relate to time in a standard fashion. If men...did not have the

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[24] Ibid., p. 21.
[25] Gerard T. Moran, "Conceptions of Time in Early Modern France: An Aprroach to the History of Collective Mentalities," *Sixteenth Century Journal* 12, no.4 (Winter 1981), p. 4.
[26] Ibid., p. 37.
[27] Ibid., p. 140.

same conception of time...all contact between their minds would be impossible, and with that, all life together."[28]

The possession of means and ways to "time" the behavior of the members of any group in such a way that each member apprehends "the appointed time" in the same way as do the other members has been among the most urgent needs of social life at any time and any place. Without this, social life itself is impossible.[29]

Social adaptation requires that time not be the old unreliable time-experience of individuals, but invariable and common for all individuals. On the basis of this alone is cooperation in economic and social activity possible.[30] The hour and clock produce the social medium for the coordination of human activity. Modern social and economic relations are established by the synchronization of the society and social relationships.

A standard system of units of time enables different people to measure the passage of time in an identical matter. A standard time-reckoning and dating framework allows the dating of any past, present, or future instant in a common fashion. Thus, time becomes a concept which is constructed by each individual under the influence of the society in which he lives.

Urbanization and the centralization of the state and trade increased the importance of accuracy and synchronization in society. After these developments, people were required to be available for interactions at precise and predictable points in time in order for the expanded set of embedded acts to be completed

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[28] Emile Durkheim. *The Elementary Forms of the Religious Life* (New York: Free Pres, 1965), p. 30.
[29] Pitirim Sorokin. *Sociocultural Casuality, Space, Time* (Durham, N.C.: Duke University Pres, 1943), p. 173.
[30] Radhakamal Mukerjee. "Time, Technics, and Society," *Sociology and Social Research* 27, p. 257-8.

within a fixed cycle of clock time. This is possible only if there is an increase in the temporal synchronicity of the various social times involved.[31]

The most fundamental process of social change has been the transformation from organic to mechanical solidarity. Concurrent with the changes in the social organization of other institutional spheres there has been a sweeping reorganization of social time. Generally these changes may be described as a leap in the temporal synchronization within and among the elements of every level of the social structure. The social consequence of this synchronicity causes not only the organization of society at large, but also the consciousness of its individual members.

The manufacture of clocks and their use in urbanized societies resembles mask making and its use in pre-modern societies. People know that the masks are made by humans; however, they think that they resemble supernatural things. The mask provides a sprit with a body, so to speak. Clocks give time a body or give it a material form.[32] People live in a symbolic world created by them. In the imaginative relationship, there is alienation between the human and nature, and the human lives in some structures that are formed by a secular authority, like the clerics who determined the human way of life in ancient societies.

Yet another alteration of time began with the founding of the nation-state. Marcus writes that, "nationalism in its various forms and the appeal of Western egalitarian doctrines to under-privileged nations produce new value structures that obviously disrupt an integrated pattern of culture."[33]

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[31] J. David Lewis and Andrew J. Weigert. "The Structures and Meanings of Social Times," *Social Forces* 60, no. 2, Special Issue (December 1981), p. 453.
[32] Ibid., p. 154.
[33] John T. Marcus. "Time and the Sense of History," *Comparative Studies in Society and History* .3, no. 2 (January 1961), p. 123.

In the pre-modern era, time was determined as a point and there was no synchronicity among the time systems in a single country. After modernization, more sophisticated, constant time standards conquered the personal life. Modernization and secularization took the place of God in the lives of humans and they put nature at the center of life. This alteration led to the formation of a conception of time and it was purified with a sacred dimension. These caused a more analytical and secular time conception.

The age-old relationships between number-time, market-time, and religion-time began to change after the spread of transportation and communication technologies. The railway and telegraph introduced a new style of life. People could travel in one day distances that had taken one month. States became able to centralize their administrative systems and take firmer control of their boundaries.

To discuss the evolution of the philosophy of time, it is necessary to go back to the ancient era. Aristotle had great influence on the constituton of the western concept of time. He presented the first theoretical and non-mythological basis of time, which became the basis for the establishment of modern natural physics and science. According to Aristotle in *Physics*, time is argued in relation to motion or movement. First, Aristotle says that, "the passage of time is current everywhere alike and in relation with everything. And further, all changes may be faster or slower, but not so time; for fast and slow are defined by time, 'faster' being more change in less time, and 'slower' less in more...It is evident, therefore, that time is not identical with movement."[34] Second, however, "we are not aware of time when do not distinguish any changes, then we say that time has elapsed, it is

[34] Aristotle. *Physics*. trans. P.H. Wicksteed and F.M. Cornford. (London: William Heinemann Ltd, 1929), p. 218.

clear that time cannot be disconnected from motion and change."[35] Thus, time is regulated by the mode of changes of entities, while it identifies their changes.

These two means of the regulation of time, which appear to be incompatible with each other, are integrated as a measure or number which pertains to movement. "When we perceive a distinct before and after, then we speak of time; for this is just what time is, the calculable measure or dimension of motion with respect to before and afterness."[36] It is important to note that,

> time, then, is not movement, but that by which movement can be numerically estimated...But now, since, 'number' has two meanings (for we speak of the numbers that are counted in the thing in question, and also of the numbers by which we count them and in which we calculate), we are to note that time is the countable thing that we are counting, not the numbers we count in which two things are different.[37]

Aristotelian time is measurable and quantitative, and is a kind of duration in that sense, differing from the concept of the modern sciences in which time is regarded as an indurable collection of infinite points, or "now"s.[38]

As discussed above, the ancient Greek concept of time in general was cosmic and circular. The characteristic of the circular perpetuality of time was supported by the statement of Aristotle that, "indeed, it is evident that the mere passage of time itself is destructive rather than generative...But yet, after all, it is not really time itself that destroys things in this way, but the changes that do destroy take place concurrently with time."[39] Greek and other ancient societies in general had a concept of time as circular and they identified their fate with the passing of time. In

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[35] Ibid., p. 218.
[36] Ibid., p. 219.
[37] Ibid., p. 219.
[38] ShigeyukiYoshida. *The Ontological Weltanschauung of Islam: A Comparative Study of the Concept of Time* (The Institute of Middle Eastearn Studies: Tokyo, 1986) p. 15.
[39] Aristotle, p. 222.

that sense, it seems that the Hebrew concept of time, rectilinear time, was innovative, as will be discussed shortly.[40]

In ancient Egypt, time was circula. This was an act of God, not man. In ancient Greece, while time also was circular, like the cosmos, it was more humanistic than that of other ancient societies.[41] The concept of time began to change with Judaism. Time became linear and it had purpose. It was not personal; it was interested in the Jews.[42] Two presuppositions are easily recognizable in modern treatments of the Hebrew idea of time: one is racial, the other religious.[43] Ancient Judaism introduced new types of time perspective, one which may be labeled "historical" or "linear" or "developmental", depending upon one's perspective.[44] In Judaism, time is linear; however, it is different from the evolutionary linear time in that time is begun with God and has an end on Doomsday.

The Christian concept of time was rectilinear, with two extremes, the beginning and the end of the world and the arrival of the Messiah. It is undeniable that this Christian concept of time formed the basic structure of the western physical concept of time in general, apart from the doubt as to whether Christianity itself intended this or not.[45] For the Christians, as for the Jews, time had an end; also it was linear and had a sense or direction, tending toward God.[46] The linearization of the time in Christian tradition can be seen as composing linear continuity in 525. Throughout the whole medieval period, the cyclic and linear concepts of time were

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[40] Yoshida, p. 20.
[41] Doğan Özlem. *Tarih Felsefesi* (İzmir: Ege Üniversitesi Edebiyat Fakültesi Yayınları, 1984), p. 10.
[42] Reha Çamuroğlu. *Dönüyordu -Bektaşilikte Zaman Kavrayışı-* (İstanbul: Doğan Kitapçılık Aş., 2000), p. 15.
[43] Arnaldo Momigliano. "Time in Ancient Historiography," *History and Theory* 6, Beiheft 6: *History and Concept of Time* (1996), p. 2.
[44] Murray Max. "Ancient Judaism and the Protestan Ethic," *American Journal of the Sociology* 65, no. 5 (March 1960), p. 453.
[45] Yoshida, p. 21.
[46] Jaques Le Goff. "Merchant's Time and Church's Time in the Middle Ages," *Time, Work, Culture in the Middle Ages* trans. Arthur Goldhammer (Chicago: The University of Chicago Press, 1982), pp. 31-32.

in conflict. Traditionally, it will be recalled, the Hellenistic concept of time was contrasted with the Christian.

St. Augustine discussed the past, the future, and time in general as being postulated from the point of the present. He argued that time was innately subjective in human souls. This conclusion of subjectivity reflected Christian teachings. Hence, the philosophical speculations of St. Augustine established the foundations of the subjective and epistemological mode of time, as it implicated a mode of time as substantial co-ordinates.[47]

The great leaders of the scientific revolution of the seventeenth century were also much concerned with temporal and horological metaphors, but with them a different outlook was began to prevail. Whitrow writes that Kepler specifically rejected the old quasi-animistic magical conception of the universe and asserted that it was similar to a clock. The invention of the mechanical clock played a central role in the formulation of a mechanic conception of nature that dominated natural philosophy from Descartes to Kelvin.[48]

Additionally, the reification and commodification of time were developed in compensation for alienation to and from time. Defamilization in society and the psychopathic symptoms of urban inhabitants, for example, seem to have certain relations with alienation from the undivided and organic flow of time.[49]

After the renaissance and reformation in Europe, the relationship between individual, society, and nature was altered and adapted to the new world order. Newton divided time into two parts: mathematical-chronometric and historic-chronologic. Leibniz objected to the Newtonian and Aristotelian time conceptions; he argued that the present time is expecting the future and loads the past. It can be

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[47] Yoshida, p. 19.
[48] Whitrow, *What Is Time?* p. 21.
[49] Yoshida, pp. 25-6.

said that this is a linear time perception and he emphasize the importance of the present.

The Islamic concept of time will be compared with the Western conception in order to elucidate the peculiar manifestation of the Islamic world view. According to Gazali, "the philosophers are confusing the intrinsic (*dhati*) beforeness and the temporal (*zamani*) beforeness."[50] The world is eternal with God from the viewpoint of temporality. However, God precedes the world intrinsically and God is transcendental. That is, only God is the ultimate reality, and time (*zaman*) is not a reality, but is nothing but a relationship (*nisbah*).[51] Because of the limit of their ability of representation, human beings cannot but regard time as a kind of reality. "The representing ability of human beings (*wahm*), when it thinks of a beginning whatever it is, cannot grasp the beginning of unless it imagines something preceding it. It is thought as if this 'something preceding the beginning'; that is, what the representation cannot be independent of, realizes itself. That is time."[52]

In other words, time "depends upon the representing ability of human beings and is psychological and subjective." Yoshida writes that,

> according to Gazali, time is just a relationship and he refutes the realization of time as the philosophers did. In this sense, time belongs not to the attributes of God, but to this phenomenal world for our subjective representation. That is to say, his thought of *tevhid* (unification of God) expresses the idea that God is a sole existence (*vucud*) and that the existence of all creatures completely depends upon God as the prime Cause.[53]

Ibn Sina discussed time in the physical realm. Like Aristotle, he defined time as the quantity, or measure, of motion, accompanying changes of motion:[54] "If there

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[50] Toshihiko İzutsu. *History of Islamic Thought* (Tokyo: Iwanami-shoten 1975), p. 267.
[51] Ibid., p. 268.
[52] Gazali, *Tahafut al-Falasifat* (Ed. M. Bouyges, Beirut, 1962), p. 68. quoted by Yoshida, p. 43.
[53] Yoshida, p. 43.
[54] Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines* (Cambridge: Harward University Press, 1964), p. 225.

is no change and no motion, there is no time."[55] He said that "time can only be imagined in connection with movement. Where one cannot feel movement, one cannot feel time."[56] He also wrote that,

> Generation (*tajaddud*) ... is possible only to a substratum (*mawdu'*)... Generation accompanies ... especially what is continuous and invisible in itself, that is, what can become cyclical (*al-wad'iyah al-duriah*) continuity (*ittisal*). This continuity is measured, for both further 'beforeness' and nearer 'beforeness' are the quantity which is measured concerning changes (*kamm muqaddar*). This measured quantity is time and it is the quantity of movement. However, it is not quantity from the viewpoint of distance, but from the viewpoint of before-and-afterness which cannot co-exist.[57]

Hence, the physical argument of Ibn Sina concludes the eternity of time. Since time is the measurement of movement, the world as the total sum of movers is consequently also eternal. Moreover, his claims largely are based on the physical dimension of time.

Ibn Rusd says that the world is recreated each moment by God, succeeding the assertion of the theologians, especially the *Eşaris* (an Islamic sect). He seeks here the overflowing merciful will of God.[58] Yoshida writes that, "the fundamental question is not 'What is time?' but 'What does so-called time reflect and manifest?' This means that time is not a unilateral fixed and stable framework which regulates human beings and activities, but a reflection of a certain dynamic Weltanschauung."[59]

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[55] Ibid., p. 225.
[56] Ibid., p. 225.
[57] Ibid., p. 225.
[58] Yoshida, p. 54.
[59] Ibid., p. 129.

Hall defines time as "a core system of cultural, social, and personal life and says that "in fact, nothing occurs except in some kind of time frame."[60] He also classifies time, saying,

> Years of exposure to other cultures demonstrated that complex societies organize time in at least two different ways: events scheduled as separate items –one thing at a time- as in North Europe, or following the Mediterranean model of involvement in several things at once. The two systems are logically and empirically quite distinct. Like oil and water, they do not mix. Each has its strengths as well as its weaknesses. I have termed doing many things at once: Polychronic, P-time. The North European system –doing one thing at a time- is Monochronic, M-time. P-time stresses involvement of people and completion of transactions rather than adherence to preset schedules.[61]

Yoshida writes that,

> the validity of cultural anthropological definition and analysis of time should be accepted restrictedly as one partial aspect of the whole figure of the world, for human beings work upon and transform the mode of time at the same time as they are temporal existence and regulated by time. The world and human activities are not simple enough to be classified and reduced into a describable principle.[62]

Time and space are the manifestations of the outlook on the world and universe in their broadest sense. Human activities regulate and transform the mode of time at the same time influences and regulate human beings. They are interrelated and interpenetrating.

In Islam, time is linear, like in Judaism and Christianity, but it has a direction from first creation to the doomsday; that is, it has a beginning and an end. The Islamic calendar circulates through all of the seasons in thirty-three years. However, the number of year is linear like the other calendar. It is different from the modern linear time conception in that it has any evolutionary dimension.

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[60] Edward T. Hall. *The Dance of Life -The Other Dimension of Time-* (New York: Anchor Press, 1984), p. 3.
[61] Ibid., pp. 45-46.
[62] Yoshida, p. 137.

At this point, the discussion turns to the time division literatures, such as the calendar, day, week, month, and year. The term of "calendar" is derived from the Latin *calendarium*, meaning that "interest register," or "account book," itself a derivation from *calendae* (or *kalendae*), and "the first day of the Roman month," "the day of future market days, feasts," and other occasions were proclaimed. Elias writes on the meaning of calendar that it comes from the Latin word *calare*, meaning "action." The *calendare* were the days which were to be announced to the people. It came from the tradition of the Roman religious official announcing the new month in the streets.[63]

In the fourth century, there were three calendars with the acceptance of Christianity: the Jewish calendar, which begins from spring; the sun calendar, reformed by Jules Caesar; and the Christian calendar, based on the resurrection of Jesus.[64] The other societies were filled with admiration because the Roman calendar was constituted by calculation, not measured simply.[65]

In ancient societies, the calendar was determined by clerics and announced to the people. This type of calendar determined the religious days and governmental programs of the official working period and collecting taxes. As mentioned above, in the Roman Empire, the priest determined the special days and announced them to people.[66] In the Empire, the working periods of the officials were determined according to the calendar produced by the clerics.[67]

In these systems, there was no importance given to the people's daily life as in the modern period. In the Middle Ages, people reacted, making a relationship

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[63] Elias, p. 243.
[64] Arno Borst. *Avrupa Tarihinde Zaman ve Sayı –Computus-* trans. Zehra Aksu Yılmazer (Ankara: Dost Kitabevi, 1997), p. 22.
[65] Ibid., p. 25.
[66] Borst, p. 20.
[67] Elias, p. 244.

between nature and dating with the logic of arithmetic.[68] The calendar days began to have numbers.[69] Numbered days, like 2 March, were first applied in Luzerne in 1252; although this system was accepted, it did not become widespread. Zerubavel claims that, "the evolution of a standard system of units of time and standard time-reckoning and dating frameworks is quite parallel to the evolution of such system as language, religion, and law."[70]

Elias writes that the development period of the calendar in Europe is a very useful example of the development of human knowledge and its relation with the social transformation which has been lived for thousand of years.[71] More information can be obtained from a search of time measurement systems and improvements of their application methods in the social arena. In western societies, especially in the modernization period, they entered into a period of unification of daily habits and tools.

In the Middle Ages, the calendars of the different countries began the year differently. For example, the year was begun from Christmas in Germany, from Easter in France, and from the annunciation about the Virgin Mary in Britain and Italy.[72] This caused some problems between countries in terms of trade and politics. The days, months, and seasons were determined according to nature. The natural year was discriminated from the official year according to the political power, and the months were divided into twenty-eight or thirty days according to the

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[68] Borst, p. 61.
[69] Ibid., p. 91.
[70] Eviatar Zerubavel. "The French Rebuplican Calendar: A case Study in the Sociology of Time," *American Sociological Review* 42 (December, 1977), p. 868.
[71] Elias, p. 242.
[72] Borst, p. 92.

traditions.[73] In the sixteenth century, in Europe, people used the Folk calendar to keep track of time and ordered their work according to this time-table.

Borst, writing about the emergence of the calendar, reports that humans learned to use calendars when they were divided into the peoples. The Greeks, Roman, Jews, and Christians composed their calendars differently. Before the modernization period, each people dated history according to its own calendar system.[74] Then, the calendar system was unified. For example, 1 January was declared New Year's Day by the French King Charl IX in 1566. In 1582, the Julian calendar was reformed by Pope Gregory, and called the Gregorian calendar. This calendar system was adopted by the other countries in Europe only slowly, taking some three hundred years to be adopted by all because of some objections. This unification period occurred along with the modernization of the world.

In 1793, after the French Revolution, the revolutionaries refused all religious chronology and produced a new calendar that was adopted from the old Egyptian calendar. They claimed that with the new calendar, the new era had begun and it would spread liberty and fraternity to all humans. This calendar was maintained for at least a decade.[75] The attempt to secularize the calendar was met by stern resistance, and its failure demonstrates the deeply rooted institutionalization of the western temporal framework.[76] The French people, however, continued to use their old religious calendar in their daily activities.

Apart from the West, in the Middle Ages, in Eastern countries, especially in the Ottoman Empire, a different calendar system was used. Within the Enpire, the Christians used the Julian calendar, the Muslims used the Hicri calendar, and other

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[73] Ibid., p. 84.
[74] Ibid., p. 120.
[75] Ahmet Kuyaş. "Fransız Devrimi Takvimi" *Cogito*22 (Bahar 2000), pp. 202-7; Zerubavel, "The French Rebuplican Calendar: A Case Study in the Sociology of Time", pp. 868-77.
[76] Zerubavel, p. 871.

societies used the calendar system based on their traditions. However, these calendars were prepared by clerics or governmental officers.

The official calendar was the Hicri calendar. This calendar was prepared by the *Müneccimbaşı* (chief imperial astronomer) and presented to the Sultan at *Nevruz* (the beginning of spring). Within the *Müneccimbaşı* calendar, there were many different calendars which were related to the people who lived under Ottoman rule. They were the Julian, Alexander, Coptic, and Folk calendars. On the fiscal level, the government used a kind of Julian calendar that was suitable for the seasons and the tax collection period. After the modernization period, especially the 1860s, use of a new calendar began to be used, known as the Rumi calendar. Indeed, when we compare the unification of the calendars in western countries and the changing of the calendar system in the Ottoman Empire, it can be seen that the two periods resemble each other.

The calendar reform in the West was made by the Church; however, the modernization period, which brought on secularization in the West, produced the unification of calendar that was based on secular foundations in all countries in four hundred years. The western calendar reform straightened the Julian calendar that had had some adaptation problem with the seasons. In contrast to Western countries, the Ottoman Empire used a lunar calendar. It was not in tune with the seasons and it caused some problems. First, at the financial level, the Rumi calendar, based on a solar circle, was used in the Empire. At the end of the nineteenth century, this calendar system became widespread at every governmental level. The transformation from the traditonal ways of conceiving time in the Ottoman Empire to the modern conception of time in the Republic will be discussed in the following chapters.

The Clock

The clock is an instrument that shows the time. Actually, time can not be measured; the thing that can be measured is a period in a system. The clock supplies an agreement mechanism for society to order their work in a synchronized fashion. Clocks provide an internal and external discipline in social life. They resemble physical symbols, and put order to daily life. Elias writes that clocks, which are produced by humans and produce physical motion that provides a synchronous physical and social process, measure the period in physical and social continuity.[77] By this interpretation it can be understood that the clock, invented by humans, confines humans in their rules.

Clocks are used like natural events that show the time and order human social relationships; they also provide synchronization in daily life. This synchronization is more important in modern life, which is based on technological tools than in societies which lived before modernization period.

The development of time measurement and its increasing effect on social life in Western countries can be seen in the history of the place of clocks in Christianity. In Christianity, the prayer times and their placement throughout the day were important. For this reason, the clerics were motivated to learn time measurement methods, as well as in order to announce the time to the people. Little Dionysius prepared a calendar base in the sixth century. In 540 BC, the Benedictus made the feast days of primary importance. He selected the three main sections of the late Roman sun day for the daily chorus prayer: the roster time in the military was the

[77] Elias, p. 71.

third hour in the morning (*tertia hora*), the sixth hour (*sexta hora*) at noon, and the ninth hour (*nona hora*) in the afternoon.

In addition to these, he introduced four prayer times which were recognized by everybody: sunrise (*prima hora*), sunset (*vespera*), dawn (*matutina*), and darkness (*completorium*). He determined waking, eating, working, and resting hours during the days according to the sun seasons. The daytime was divided into twelve hours. It began the dawn (*prim*) and maintained noon (*sext*) and sunset (the *vesper*). These became the prayer times in the church and the reaping times in the field. However, Beda declared that time, which is created by God, cannot be measured by humans.[78]

In the ninth century, the seasonal measurement of time was interrupted by the Christian calendar and prayer hours. Christians had to realize the borrowed times and searched it scientifically and lived religiously. Rationality and the present-day became the main principles for prayer to God. However, the times which pertained to God and the Saints were not suitable for the ordinary people in daily lives.[79]

In Christianity, the prayer times are important in daily life. Prayer is done at special times in the day. For this reason, the Christians needed to know what the time was. After the mechanical clock was invented, time could be determined by gnomons (gnomon, in which pointed to the celestial pole, the direction of its shadow could be made to show solar time) in daylight. The hours in the temporal system that are measured by the gnomon are different according to the season.

The other hour system used in Europe in the Middle Ages was the equinox hour system. The equinox occurs twice a year at the other times time was calculated

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[78] Ibid., pp. 30-44.
[79] Ibid., p. 56-69.

by astronomers. This hour system was used to determine the night prayer times.[80] In this era, the temporal hours translated into equinox hours, although the times were measured by water clock as abstract, homogeneous hours.

In ancient societies, hours were determined by gnomons, water clocks, and fire clocks, usually by clerics. Most ordinary people were not interested in what the time was; they lived according to natural time. With Judaism, Christianity, and Islam, time measurement became important for prayer. Jewish, Christian, and Muslim astronomers developed astronomical methods and developed their skills and methods on astronomical issues. Prayer is performed in a central religious location in the Judaism and most of the Christian denominations. In these centers, the hour is determined and the hour of prayer announced to the people. In Islam, the hours are announced by the *ezan* (call to prayer). The time symbol in Christianity is bells. Borst says that bell time is more historical than creation time and natural time.[81]

The invention of mechanical clocks brought a new conception of time. The hour measurement tools were made according to social needs and technological development. Most researchers on the subject of mechanical clocks claim that the first mechanical clock was produced in Europe. However, if we look closely at the technological development of every society and their science histories, we see that every society solved its measurement problem according to it needs. Borst writes that the Muslims who came to Europe in 985 astonished Latin Europe with their time measurement systems and tools.[82] It is likely that European clock makers based their technologies on these examples.

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[80] Borst, p. 36. In this page, the author writes about the time measurement methods in the Christianity in fifth century.
[81] Ibid., p. 47.
[82] Ibid., p. 57.

Mechanical clocks were made by the unification of the principles of the astrolabe and abacus. The mechanical clocks put into the church towers in Europe could be seen from every part of the city or town. Borst writes that this practice standardized time in the view of the Church.[83] However, the hours of the day were different in each place. In spite of this, the mechanical clock profoundly altered the conception of time in the Middle Ages, and producing a new synchronous rhythm to daily life.

From the thirteenth century, most likely in Italy, people began to make numerical count of objects and to date the events and changes in the world. The numbering of all things became widespread in daily life; however, people liked to live in a world that was based an approximate value. Afterwards, most establishments tried to number and date everything. Most of the people, however, opposed this development and its mentality.[84]

Mechanical clocks, which showed the time in equal hours, took the place of prayer hours. The clock dial and minute hand proved clearly an Aristotelian assertion of the time that had a uniform number of movements proceeding from before to after.[85] At the end of the sixteenth century, the sacred days and numbers lost their importance; calculations and dates became important in daily life.[86]

Galileo and his experiment assisted the development of a physical time conception which was nature centric. He measured natural events with the clock. This new conception altered the traditional human-centric time conception. These experiments supported the dualism between physical time and social time. This

[83] Ibid., p. 98.
[84] Ibid., p. 92.
[85] Ibid., p. 101.
[86] Ibid., p. 78.

development means that time did not measure a purpose with God located at its center.

Chronometers, which were produced according to mechanical clock principles, supplied the geographical discovery facilities to the Europeans who lived in the age of geographic discoveries. The development of clock technologies produced more synchronized ship routes and time standards in these voyages.

The Time, Working Life, and Commodity

Before the modernization period, most people were religious and tried to live in a religious way. Max Weber describes, in *The Protestant Ethic and the Sprit of Capitalism*, this situation with the example of working day of the German peasant.[87] In this example, the traditional mental structure regarding time, money, and world view are evident. People preferred more time to live the traditional way.

Working life called for ordered working schedules prepared in a systematic hour circle. The working hours were announced with bells in the Church tower. The employers and workers needed a common time standard. One example, in 1355, is that the royal governor of Artois authorized the people of Aire-sur-la-Lys, to build a belfry the bells of which would chime the hours of commercial transactions and the working hours of textile workers. After this example, Le Goff says that,

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[87] Max Weber. *The Protestant Ethic and the Sprit of Capitalism* trans. Talcott Parsons (New York: Charles Scribner's Sons, 1958), p. 60.
"A man, for instance, who at the rate of 1 mark per acre mowed 2 ½ acres per day and earned 2 ½ marks, when the rate was raised to 1 ¼ marks per acre mowed, not 3 acres, as he might easily have done, thus earning 3,75 marks but only 2 acres, so that he could still earn the 2 ½ marks to which he accustomed. The opportunity of earning more was less attractive than that of working less. He did not ask: how much can I earn in a day if I do as much work as possible? But: how much must I work in order to earn the wage, 2 ½ marks, which I earned before and which takes care of my traditional needs. This is an example of what is here meant by traditionalism."

> the use for professional purposes of a new technique for measuring time is plainly evident. It is the instrument of a class, "since this particular city is governed by the textile trade," which shows to what extent the evolving mental structures and their material expression were deeply implicated in the mechanism of the class struggle. The communal clock was an instrument of economic, social, and political domination wielded by the merchants who ran the commune.[88]

The process responsible for the rationalization of time was also responsible for its secularization. Le Goff writes that, "more for reasons of practical necessity than because of the underlying theology, the concrete time of the Church, as adapted from antiquity, was the time of the clerics, given its characteristic rhythm by the religious offices and the bells which announced them."[89]

This time was determined, as required, by imprecise and variable sundials or, on occasion, measured by crude water clocks. Merchants and artisans began replacing this Church time with a more accurately measured time useful for profane and secular tasks, clock time. The clocks which, everywhere, were erected opposite church bell towers, represented the great revolution of the communal movement in the time domain. Urban time was more complex and refined than the simple time of the countryside measured by "rustic bells." The working hours were adopted from the church pray schedule in early capitalism in Europe at the end of the thirteenth century.

There was a difference between the merchant's time and the Church's time. The conflict, then, between the church's time and the merchant's time emerged as one of the major events in the mental history of these centuries at the heart of the Middle Ages, when the ideology of the modern world was being formed under

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[88] Le Goff, pp. 35-36.
[89] Ibid., p. 36.

pressure from deteriorating economic structures and practices. The major points at issue in this conflict will be discussed below.[90]

Time was not a natural event like the peasant's working style. Time was an abstract item that was not related to natural events. Like the peasant, the merchant was at first subject by his professional activity to the dominion of meteorological time, to the cycle of seasons and the unpredictability of storms and natural cataclysms. He long had no choice but to summit to natural order and no means to act other than prayer and superstitious practice.

Once commercial networks were organized, however, time became an object of measurement. The duration of a sea voyage or of a journey by land from one place to another, the problem of prices which rose or fell in the course of a commercial transaction (the more so as the circuit became increasingly complex, affecting profits), the duration of labor of craftsmen and workers (since the merchant was almost always an employer of labor), all made increasing claims on his attention and became the object of ever more explicit regulation.[91] For the merchant, the technological environment superimposed a new and measurable time, in other words, an oriented and predictable time, on that of the natural environment, which was a time both eternally renewed and perpetually unpredictable.[92]

The communal clock changed the natural time conception. The communal clock was an instrument of economic, social, and political domination wielded by the merchants who ran the community. They required a strict measurement of time because, in the textile business, "it is fitting that most of the day workers –the

[90] Ibid., p. 30.
[91] Ibid., p. 35.
[92] Ibid., p. 35.

proletariat of textile trade- begin and end work at fixed hours." This was the beginning of the organization of work, an early precursor to Taylorism.[93]

Time began to change in order to supply money to the merchants. Another important change was due to the merchant's discovery of the price of time in the course of his exploration of space.[94] Time which put the Church in control was changed by the moneylender. The time in which the Christian merchant worked professionally was not the time in which he lived religiously. From his profits, the merchant with held God's portion, which went toward good works. There was a time for sin and a time for grace. There was a time for death in the world before resurrection.[95] There was natural time, professional time, and supernatural time. On every level, people used these times according to their needs. They, especially people who did not work in the field, lived in natural time, worked in professional time and they prayed to God in supernatural time. Time was divided into many parts by the ordinary people, although not by the clerics. However, the time of salvation and the time of business were reunited in the unity of the individual and collective life.

The unit of labor time in the medieval West was the day. The urban working day was defined with reference to variable natural time, from sunrise until sunset, which was marked off in an approximate way by religious time. On the whole, labor time was still the time of an economy dominated by agrarian rhythms, free of haste, careless of exactitude, unconcerned by productivity –and of a society created in the image of that economy, sober and modest, without enormous appetites, undemanding, and incapable of quantitative efforts.[96]

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[93] Ibid., p. 36.
[94] Ibid., p. 36.
[95] Ibid., pp. 37-38.
[96] Ibid., p. 44.

Working hours were not regular and Thompson writes that the irregularity of the working day and week was framed, until the first decade of the nineteenth century, within the larger irregularity of the working year, punctuated by its traditional holidays and fairs. [97] Thompson utilized the notion of time to explore a new set of relationships created by the industrial revolution.

With the invention and spread of the mechanical clock, which at least made it possible for the hour to achieve its mathematical sense, new types of time standards in daily life in Europe emerged. These clocks conquered the major urbanized areas and began to determine the life-styles of the people. However there was no synchronism in time standards in the country until end of the fourteenth century. The first time standards were applied in Paris. The new time became the time of the state. A more precisely measured time, the time of the hour and the clock, became one of man's primary tools.

Mumford argues that orderly punctuality in life in the West first took shape in the monasteries.[98] He also writes that the clock is the key machine of the modern industrial age.[99] Landes writes that the mechanical clock made punctuality possible, a civilization attentive to the passage of time, hence to productivity and performance.[100] In the industrial age, the mechanical clock determines not only the hours but also the rhythm of daily life.

Thompson says that, "we are examining here not only changes in manufacturing technique which demand greater synchronization of labor and greater exactitude in time-routines in any society; but also these changes as they

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[97] E.P. Thompson. "Time, Work-Discipline, and Industrial Capitalism," *Past and Present* 38 (December 1967), p. 61.
[98] Lewis Mumford. *Technics and Civilization* (New York: Harbinger, 1963), p. 16.
[99] Ibid., p. 14.
[100] David S. Landes, *Revolution in Time* (Cambridge, Massachusetts, and London: Harward University Press, 1983), p. 7.

were lived through in the society of nascent industrial capitalism."[101] Synchronization of the society can be seen in working life in early industrial age. Daily life was put in order according to new working discipline and time was evaluated as an economic instrument.

Technology caused new time discipline to regulate life according to its own principles. As Thompson claims that without time-discipline we could not have the insistent energies of industrial men; and whether this discipline comes in the forms of Methodism, or of Nationalism, it will come to the developing world.[102] The meaning of time in people's mind was changed by these developments and it can be said that time, which used to belong to God alone, was thereafter the property of man.

The relationship between the factory, mechanization, and a new spirit of regularity within the workforce was made explicit. All of this was contrasted with the often irregular nature of the workforce before steam and the extended division of labor constrained the work routine.

In the 1880s, an American engineer, Frederic W. Taylor wrote *Time Studies* which considered workers living machines. The movement of workers was measured by the chronometer, the cost was counted, and the standards between the time and wage were constituted. Afterwards, not only the time measurement tools but also the inspectors were called timekeepers.[103] Time became a value that obliged perfect progress and standards in all things.

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[101] Ibid., p. 80.
[102] Ibid., p. 93.
[103] Borst, p. 124.

CHAPTER II

CALENDARS IN THE OTTOMAN EMPIRE

The *Müneccimbaşı* Calendars

In the Ottoman Empire, the *Müneccimbaşıs* prepared the calendar every year as well as the *İmsakiye of Ramadan* (Islamic timetable showing when the fast begins for each day of Ramadan), and *zayice* (astronomical table) and determined auspicious hours. The office of the official astronomer of the Sultan was established in the mid-fifteenth century, during the reign of Sultan Murat II. In the Ottoman Palace, they became part of *Birun*, and their ranks were made up of the *ilmiye* who had been trained in astronomy, astrology, and mathematics. They served under the *Hekimbaşı* (chief physician) and were connected to the *Silahdar Ağa*. The *Müneccimbaşı* was assisted by a *müneccim-i sani* (second *müneccim*) as and one or more *müneccims* as *katip* (clerks). The office of the *Müneccimbaşılık* continued until 1924, with the death of the last *Müneccimbaşı,* Hüseyin Hilmi Efendi, after which it was abolished by the Republic of Turkey.

As stated above, among the duties of the *Müneccimbaşı* was to prepare a calendar for the Ottoman State every year. These calendars were prepared as manuscripts composed of two chapters, the *Rakam Takvimi* and the *Ahkam Takvimi,* with a total of 25-28 pages.

The first chapter of the calendar[104] was the *Ahkam-ı Sal* or *Tali-i Sal* (*sal* means "year" in Persian) that set out the *zayice* (horoscope) of that year. Along with the

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[104] A. Necati Akgür. "Müneccimbaşı Takvimlerinde Tarihleme Yöntemleri", *Türk Dünyası Araştırmaları* 80 (Ekim, 1992) p. 99.; Salim Aydüz. "Müneccimbaşı Takvimleri ve Tarihi Kaynak Olarak Değerleri," *Cogito* (Bahar 2000), p. 137. The First Chapter: The introduction of the calendar

names of the reigning *Sultan* and current *Müneccimbaşı*, a horoscope was given for every social stratum in the Empire. The last two parts of this chapter presented forecasts related to abundance-absence, the condition of agriculture and harvests, rains, winds and storms, the events of the earth and sky, civic turmoil and rebellions, wars and deaths, and the conditions of peace, soundness, and safety. After that, it gives the date of *Nevruz* (the vernal equinox) according to the ancient Persian (*Yezdicürd*), the Coptic, the *İskender* (Alexandrian), and the *Celali*, and the *Hicri* calendars. Finally, it gave the horoscopes of the babies born that year and what year it was in the *Oniki Hayvanlı* (Twelve Animals) calendar.[105]

The second chapter[106] formed the main part of the calendar, and took up thirteen pages. It was put in order to like the *Celali* calendar, with thirty days on each page; the last page had a part with additional days. The new year began on the vernal equinox. For this reason, the *Müneccimbaşı* calendars were ordered according to the number of *Celali* years. For example, 11 March 1453 was equal to the *Celali* year 375.

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features historical information and astrological subjects. To the part about historical information, the *Müneccim* added a paragraph to this part, which summed up the events of the earlier years. It began with chronologies from Adam to the prophets, the Caliphs, the Seljuk s, the Ottomans, and the *Karaman*. After the chronologic tables come astronomical, astrological tables, and *Ahkams* (laws). In this part, the *Muneccims* pronounced the *Alamet's* (portents) about the days, years, and events that would happen, the *Ahkam* (laws) of the stars, the sun, the moon, and the seasons, blood letting, dream interpretations, and the suitable things to eat in the suitable seasons.[104]
Zayice and *Ahkam*: *Zayice* is a term that comes from Arabic. *Zic* is a table which contains data about the position of stars in the sky to allow the calculation of suitable times for humans to do things. In the calendars, predictions were made about future events. Under the title of *el-Mevasim* or *el-Mevasim and ahval-i kevakib*, *Ahkami* (law) or information about the *Sultan*, *grand vezirs*, officials, religious days and nights, the first day of the month, the position of stars and planets according to days, and the weather movements according to the seasons were given.[104] At the end of the first part, the *Oniki Hayvanlı* (Twelve Animals) calendar, which is an old Turkish calendar, was given, but only with the name equivalent the animals in one page or less.

[105] Akgür, "Müneccimbaşı Takvimlerinde Tarihleme Yöntemleri," p. 99.
[106] Aydüz, "Müneccimbaşı Takvimleri ve Tarihi Kaynak Olarak Değerleri," p. 138.;The Second Part of the *Müneccimbaşı* calendar was the main section. It featured calendars (the Rumi, the *Hicri*, the Coptic ...) with tables on thirteen pages. On these pages, information about what to do or not do on these days was given in addition to predictions for the next year and the degrees of the twelve zodiac positions. In general, the *Müneccimbaşı* calendar gave the *Hicri*, Julian and Alexander calendars; however, sometimes other calendars appeared in these small books.

The last part of the calendar contained the estimated times of the next years lunar and solar eclipses. The number of the eclipses and their durations are explained clear and the astronomical equivalents of these eclipses are provided.[107]

The calendars were composed of three main columns.[108] The part with the actual calendar was prepared with thirteen pages so that every page contained one month. The thirteenth page was reserved for a list of astronomical events. The pages also featured tables which noted the *mevsimler* (the seasons), gave *ihtariyat* (advice), explained *ahkam* (laws), and some special days.

The *müneccibaşı* calendar was produced as a small book with chapters. The first chapter, called an almanac, listed significant events, starting with the first human, the important events after that first human, and the life of Prophet. Obviously, the calculation of the date of the first human and the important events from that time were calculated in a rough way. The calendars also showed significant dates for the State.

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[107] Ibid., p.139.

[108] A. Necati Akgür, "Müneccimbaşı Takvimlerinde Tarihleme Yöntemleri," pp. 100-1.; Every page is divided into three columns. The first part gives *Ahkam-ı Nücumi* (law of stars). At the top of this column, there was the position of the moon on the first night of the *Hicri* month. In one example, "*Receb-i şerif Çeharşembe gicesi cenubi ve alçak ve mutedil görün*", means that "to appear low and moderate in the month of Rajab." The middle column contained the actual calendar, with the names of the day, such as *Yekşenbe, Düşenbe* (Sunday, Monday ...) and the number of days according to the Arabian (*Hicri*) and the *Rumi* (Alexandrian) calendars, plus the zodiac sign of that month. In addition to these, it gave the meanings of days such as the Folk calendar days, like *Evvel-i eyyam-i bahur*, *Hareket-i haşerat*; the religious days, not only the Muslims one but also the Christians ones like *Ramadan-ül Mübarak* , *Iyd-i tecelli-i Nesara*; the beginning of the months of the Coptic calendar, like *Bermude-i Kipt* and *Başens-i Kipt*; astrological observatory, like *Teslis-i Zuhre bi-Zuhal* (when a 120 degree opening appears between Venus and Saturn) and *Mukabele-i Nahseyn* (when Mars and Saturn are aligned); the rising of stars like *Tulu-u Nesre* and *Tulu-u Cebhe*; the period of daylight and night like *Nehar* (fourteen hours) and *Leyl* (nine hours). In the third column of the page, auspicious and inauspicious days were noted, such as *Sa'd, Mahzur*, and *Mümtezic*; and specialties of day, such as *Akd-i şirket, Tedbir-i asker*, and *Amel-i esliha*.

İhtiyarat: In this column, what should be done or not on these days was indicated. The activities that were not suitable to do on these days were called *el-Mahzurat* or "*şu islerden hazer oluna*" (don't do these activities). The days considered suitable for important work were called *Mubarek* (blessed) or *la-be'sidir.* The lunar dates of eclipses and solar eclipses were also given.[109]

Delalat: In this part, the official plans of the *padişah*, *ulema* (Muslim theologians and scholars), officials, and other important people were noted along with general advice about life.[110]

Tevkiat: This column featured calendar data such as important days and nights, religious festivals, information about the weather, the names of the months, and the daily positions of significant planets.[111]

Cum'uat: In some calendars, this column was called *el-usbu.* It gives the names of the week in Persian. The calendar is not only in Turkish but in Arabic as well.[112]

Mevaki-i buruc: This column showed which zodiac sign was related to the month. The zodiac names in Arabic were *Kavs, Cedi, Deliv, Hut, Ḥamel; Sevr, Cezva, Seratan, Esed, Sünbüle, Mizan*, and *Akreb.*[113]

The times of the daily prayers were listed as well as the most significant times to worship in some calendars. Because the time of prayer must be precise, it was given in hours and minutes. In addition to the five daily prayers were significant moments in Islam, such as *istibak-i nücum* (the time of appearance of the stars), *işa-i*

[109] Aydüz, "Müneccimbaşı Takvimleri ve Tarihi Kaynak Olarak Değerleri," p. 138.
[110] Ibid., p. 138.
[111] Ibid., p. 138.
[112] Ibid., p. 139.
[113] Ibid., p. 139.

evel, *işa-i sani* (the namaz of yatsı), *imsak*, *tulu-u afitab*, *vakt-i işrak*, *duha*, *dahve-i kübra* (the religious time of midday), *tahvilat-i kamer*.

Christian religious days also appeared in the *Müneccimbaşı* calendar, such as Passover, *Uruc-u İsa* (the resurrection the Jesus to the sky), and *Es-Salib-i fi l-ma* (throwing the cross in the sea).

The *Müneccimbaşı* calendar was prepared and used only at the official level. The Ottoman officials used these calendars to determine the days special to the Muslims and the non-Muslims. Until the nineteenth century, these calendars were prepared as manuscripts and distributed to the officials by the *Müneccims*. The preparing of calendar and its presentation to the Sultan and other governors were important ceremonies arranged on 21 March and were called the *nevruziye*. The *Müneccimbaşıs* prepared their calendar and delivered it to the Sultan and the governors before the *Nevruz*. The *Müneccimbaşı* received gifts and payment that were called the *nevruziye* at the presentation of their calendar.

The *Müneccimbaşılık* prepared its calendar according to the *zic,* an astronomical almanac. The Ottoman *Müneccimbaşıs*, *Müneccims*, and *Muvakkits* calculated their astrological equations with the *zic* of Uluğ Bey until the 1800s. Uluğ Bey and his colleagues prepared this *zic* at the Samarqand observatory. However, the *Müneccimbaşılık* in Istanbul realized that this *zic* did not solve every calendar problem and therefore they began to use the European *zics* in the 1800s. The *Müneccimbaşılık* used Jack Dominic Cassinis' *zic*, which was prepared by correcting Uluğ Bey's *zic*. After detecting some problems in the *zic* of Cassini, the *Müneccimbaşılık* began to use Landane's *zic* in the period of Mahmud the II. They stated to use the French observatory's *zic* after the1850s.[114] With the modernization

[114] Ekmelettin İhsanoğlu. "Batı Bilimi ve Osmanlı Dünyası: Bir İnceleme Örneği Olarak Modern Astronomi'nin Osmanlı'ya Girişi (1660-1680)," *Belleten* LVI (Ankara, 1992), pp. 750-9.

of the educational and administrative establishments, the astronomical tables were begun to used from the European countries. While many *muvakkits* and *müneccims* worked in the Empire in this period; however, they copied their main tables from the European colleagues.

The *Müneccimbaşı* represented his calendar to the Sultan as a *risale* (treatise) that was written by hand in different colors. Afterwards, the calendars were copied by the *katips* (clerks) and distributed to the governors for a fee. At the beginning of the nineteenth century, after the press became widespread in the Ottoman Empire, the calendars were printed by machine and delivered to the people. The special governor was able to have a calendar at an early period. The calendar was a sign of the official people. After the nineteenth century, the ordinary people began to have calendar. Thus, the calendar gained new meaning with the industrialization in the Empire. The calendar became a tool of the governors to know the special days in society; it became an ordinary daily means in the society. The calendar gained importance with the scheduling the daily life. The schedule caused a new synchrony system in society in the nineteenth century throughout the world. Zerubavel claims that the schedule originated in the Benedictine monastery and became part of modern production and working styles in the industrialization.[115] Apart from these, the calendar was an important tool in the Empire in the port cities and trade centers that had developed communication tools. In the rural areas, especially in mountainous areas, life maintained its natural rhythm.

The ordinary Muslim people determined time according to the seasons and followed the moon to determine religious days. The *imsakiye* of Ramadan (timetable showing when the fast began for each day of Ramadan) was prepared by the

[115] Zerubavel, *Hidden Rhythms*, pp. 31-40.

Müneccims and *Muvakkits* (person who determined prayer times); and these times were announced by the mosques. That is, like most European countries in the same period, the ordinary people did not live according to a calendar; they lived according to natural time objects such as the movement of the moon, sunrise, and sunset.

The *Müneccimbaşı* calendars supplied a time table to the governor, the official calendar was the *Hicri* calendar, the economic calendar was the natural calendar that in early periods the had been transformed into the Rumi calendar. The Muslim people lived in the natural cycle according to the rural areas, and their religion according to the *Hicri* calendar; Christians and Jews lived according to the natural calendar and used the its own cultural or religious calendars to determine the religious times. The officials used the *Müneccimbaşı* calendars to determine the tax collection dates and official work; they learnt the Muslim religious days and those of the minority populations in order to supply suitable conditions for their religions.

The *Müneccimbaşı* calendars also produced local synchronization among the Ottoman officials. Thus, the officials could act according to the same time structure in the Empire. Synchronization in the Empire was established with a lunar calendar which circulated throught the seasons. If the same time structure is used in the one arena, people can synchronize their activity according to this changeable circle.

The Provided Calendars within the *Müneccimbaşı* Calendars

The *Müneccimbaşı* calendars were *Hicri*[116] calendars for the most part; however, they contained other calendars used in the Ottoman provinces such as the Julian,[117] the Alexander,[118] and the Coptic.[119] Moreover, they contained the *Halk*[120]

[116] For more information, look at appendix, p. 143.
[117] For more information, look at appendix, p. 144.

(Folk) calendar that came from the ancient Greeks and the *Celali*[121] calendar developed by the Abbasids.

In the Ottoman Empire, the people and the officials used the *Hicri* calendar for their work and worship. Officials used the *Müneccimbaşı* calendars and determined their work according them. The Muslim people did not have written manuscripts or printed calendars until the nineteenth century. They determined the time by the observation of the moon. This work was done by the *Muvakkit* (person who determines prayer times) and religious authorities at the mosques. Sometimes, people argued over whether a certain day was the beginning of Ramadan or other important religious day. For example, a person who had seen the new moon went to the *qadi* to resolve the matter. He claimed the moon had appeared one day earlier and that two people would testify as to the truth of his claim. As a consequence, the religious festival would be postponed another day.[122]

Another example is in the newspaper *Ceride-i Havadis*, where an article on Sha'ban 1, *Hicri* 1259 number 143 declared that the calculations of the calendar showed that this day was the beginning of Rajab and that thus that night was *Kandil* (one of the Islamic holy nights when the minarets are illuminated). Some people had seen the new moon before this day and it had been determined that the next day was *Kandil*.[123] These types of occurrences were not uncommon and appeared in newspapers, such as in number 145, 148 in *Ceride-i Havadis*. These examples illustrate the Ottoman calendar views. There was no determined accuracy problem in the religious life. The Muslims could designate their religious activity according to

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[118] For more information, look at appendix, p. 146.
[119] For more information, look at appendix, p. 146.
[120] For more information, look at appendix, p. 147.
[121] For more information, look at appendix, p. 158.
[122] A.Necati Akgür, "Bayram Gününün Hesabında Büyük Hata," *Yıllar Boyu Tarih* vol. 5, no. 10, p. 36.
[123] Ibid., pp. 36-7.

the Moon's position. Moreover, the time was determined by the human eye and people could trust only their eyes. They did not accept other determining methods if they could determine the time with their eyes. Time was not an abstract item in daily life; it was a knowable thing easily accessible to anyone who knew the basic astronomical techniques. Even, the *ilmihals* (book explaining the principles of Islam) contains explanations of basic astronomical techniques to determine the daily religious practices. That is, the ordinary Muslim lived in a natural time that could be felt by individual.

The *Rumi* Calendar

In the Ottoman Empire, the *Hicri* Calendar, a lunar calendar that was designed on Islamic principles, was used for official matters from the founding of the state to the end of the Empire. The *Müneccimbaşı* calendar contained other solar circle calendars; however, at the official level these calendars were not used. For example, tax collectors collected payments according to the agricultural seasons. Because of this difference in use of the lunar calendar and the tax collecting seasons, the Palace decided to use the *Rumi* calendar for financial matters. The *Hicri* calendar was not suitable for the seasons. Because of some defects in the calendar that was based on the lunar circle, the Palace decided to take on a calendar that was based on the sun, called the *Rumi* calendar.

The first application of these types of calendars in Islamic history occurred during the Abyssinians era. In 974 AD, during era of Caliph Tay Ullah, every 31 lunar (the *Hicri*) years were made equal with 30 solar (the *Rumi*) years,[124] or 33 lunar

[124] Ahmet Cevdet Paşa. *Takvim ül-Edvar*, (Konstantiniye: 1287) pp. 40-1.

years were made equal with 32 solar years.[125] In the Ottoman Empire, the first application of the *Rumi* calendar, which was called the financial year, was put into practice in the period of Mehmet II with a *ferman* (imperial decree) on 4 Safer 1088 (29 Mart/8 Nisan 1677).[126] Apart from this, Unzunçarşılı writes that "it is known that the Ottoman State used the *Hicri* calendar which has the *Rumi* months and its example can be seen in a record on the *mukataa* (land tax record) in Mart (March) *Hicri* 987 (1579 AD).[127]

Furthermore, Sahillioğlu, explaining why the Ottomans used the *Rumi* calendar, writes that "in the Ottoman economy, the people s revenues and the State revenues that were collected from the Ottoman people depended on the seasons and the solar year. The seasons affected not only agricultural life, but also trade, customs, and even mining activities. The miners did not work in the winter months in most parts of the Ottoman State; in addition, land trades and land customs were not collected in the winter because the roads were closed due to snow. Maritime trade increased in the suitable seasons.

Revenues went two times a year from Anatolia and Rumelia, in connection with the *Merkezi Muhasebe Teşkilatı* (the Establishment of Central Accounting). The first date was *nevruz* and the second occurred in August.[128]

In truth, the revenue system and the Ottoman treasure did not depend on the lunar year and its expenditures did not connect with the solar year. Sahillioğlu bases his arguments on the articles of Ömer Lütfi Barkan,[129] who discusses how "the state

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[125] Ahmet Muhtar Paşa. *Islah ut-Takvim* (Konstantiniye: Matba-yı Ebuzziya, Hicri 1307), p. 25.
[126] Ibid, pp. 26-7, and table 2.
[127] İsmail Hakkı Uzun Çarşılı. "Buyruldular," *Belleten*, no. 19, p. 293, 1941, qouted by Faik Reşit Unat. *Hicri Tarihleri Miladi Tarihe Çevirme Kılavuzu* (Ankara: Türk Tarih Kurumu Basımevi, 1988), p. 163.
[128] Halil Sahillioğlu. "Sıvış Yılı Buhranları," *Cogito* 22 (Bahar 2000), p. 228.
[129] For more information look at Ömer Lütfi Barkan. "H.933-934 (M.1527-1528) Mali Yılına Ait Bir Osmanlı Bütçesi," *İktisat Fakültesi Mecmuası* 15, no. 1-4.; "H.954-955 (M.1567-1568) Mali Yılına

budgets of Ottoman in sixteenth century were a kind of solar year budget. These budgets were formed on one solar year that was based on the Julian calendar and it began from *nevruz* (March 11) to *Nevruz* the following year."[130]

The need for the *Rumi* calendar in the Ottoman Empire at the official level was explained, in *Hicri* 1307, by Ahmet Muhtar Paşa, in *Islahat ut-Takvim*:

> In the first period of the Ottoman Empire, the solar calendar system was not used. Over 200,000 soldiers could be fed, because the *aşar*, the value of *aşar*, *resim*, and *kuru* were collected by the owner of the *zeamet* and *tımar*. It was seen that the revenues and expenditures of the *vezirs* and the Unions that were under the *Mirmiran* departments were not contained in the *Maliye Hazinesi* (finance treasury). In short, military and civil expenditures were provided by their own revenues, which were taken from their own fields. The salaries of orderly soldiers, who were called *Kapıkulu*, were supplied with taxes that were collected according to lunar months. Therefore, there was no need for a solar calendar. However, for some land taxes which were collected according to solar calendar (to close the gap between revenues and expenditures), an extra tax which was called *tefavüt-ü hasene*. In addition to this, by the accumulation of the remainder that emerged from the difference between the solar months and the lunar months and from the decrease in money value, a gap in the treasure. After realizing the loss of money from treasury emerged. This subject was considered important.[131]

After *Hicri* 1087, the application of *tefavüt-ü hasene* was put into practice.[132]

Apart from this, the use of solar calendar for the fiscal year was according to Defterdar Atıf Efendi in *Hicri* 1087, during the reign of Sultan Mahmud I, to pay salaries and appointments in *Muhharrem* (the first month in the *Hicri* calendar).[133]

In *Hicri* 1205 (1790/1791), due to the needs of the *gümrük eshamı* (customs), the transition from lunar months to solar months began. Osman Efendi, who was from Mora and an official who headed a provincial treasury, researched the loss of

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Ait Bir Osmanlı Bütçesi", *İktisat Fakültesi Mecmuası* 15, no. 1-4. ; "H.974-975 (M.1587-1588) Mali Yılına Ait Bir Osmanlı Bütçesi", *İktisat Fakültesi Mecmuası* 15, no. 1-4.

[130] Sahillioğlu, p. 230.

[131] Ahmet Muhtar Paşa, *Islahat ut-Takvim*, p. 26.

[132] Unat, *Hicri Tarihleri Miladi Tarihe Çevirme Kılavuzu*, p. 159.

[133] Ahmet Cevdet. *Tarih-i Cevdet*, vol. VIII, p. 150-157, 372-377 qouted by Unat, p. 159.

revenues and he proved that the loss stemmed from the calculation of *tefavut-ü hasene* that had been added to some land taxes.[134] As a consequence, the application of the fiscal year by the Defterdar Osman Efendi was extended in the period of Sultan Selim III.[135]

Afterwards, with the abolition of the *zeamet* and *tımar* systems began along with that of the centralization of *aşar* and this type of revenues in the treasury, the salaries and additional payments were supplied by the treasury. Also, the solar month began to be used to pay salaries and appropriations; this rule was also put into practice by the treasury. As mentioned above, the Hebrew and *Süryani*[136] (Syrian) month names were used in the *Rumi* calendar such as *Nisan* (April), *Haziran* (June), *Temmuz* (July), *Eylül* (September), *Teşrin-i Evvel* (October), *Teşrin-i Sani* (November), and *Kanun-i Evvel* (December). On the other hand, the month names *Mart* (March), *Mayıs* (May), and *Ağustos* (August) were borrowed from the *Rumi* calendar in places of the month names *Azer*, *Ayar*, and *Ab*. Because the main issue of the treasury was land taxes at that time, it was accepted that this solar year began in Mart, which was the time of tax collection. Indeed, in spite of the solar months being counted in the solar year, the solar month was combined with the lunar year.[137]

In addition, the year 1790/91 AD, saw that the introduction of the *mali* (financial) year in the customs. However, these types of applications were not maintained uniformly at every level.

After the abolition of the *zeamet* and *tımar* systems, the state began to collect revenues, to pay salaries and make other expenditures. After these alterations, the

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[134] Ahmet Cevdet Paşa, *Takvim ul-Edvar*, p. 44.
[135] Unat, p. 163; Niyazi Berkes. *Türkiye'de Çağdaşlaşma* (İstanbul: Yapı Kredi Yayınları, 2003), p. 112.
[136] Ahmet Muhtar Paşa. *Sene-i Maliyenin Hicri Sene-i Şemsiye ile İstibdaline Dair* (Konstantiniyye: Hicri 1328) p. 8.
[137] Ahmet Cevdet Paşa. *Takvim ul-Edvar,* p. 45.

Rumi calendar became the official calendar in the Ottoman Empire based on the principles of the *Hicri* calendar. It began to be used for all official and financial records after *Hicri* 1255.[138]

In many sources, the beginning of the *Rumi* year application is stated to have been in 1840. Akgür differs, arguing that the application of the *Rumi* year could not have begun in 1840 AD or *Hicri* 1256, as this date is based on the calculation of the *Rumi* calendar.

The use of the *Rumi* calendar can be seen in the newspapers of nineteenth century. The first newspaper published by Ottoman Muslims was *Takvim-i Vekayi* in 1831. In this newspaper, the *Rumi* calendar was sometimes cited in articles. For example, in the first volume of this newspaper, it reports the news about the visit of the sultan and states that it began after the mid-day prayer *Cuma* on 22 *Zilhicce* 1246 = 22 *Mayıs Cuma* (Friday, May 22) and the article states that during this visit, 6 *Muharrem* 1247 comes on Friday, 11 *Muharrem* comes on Wednesday, and 18 *Muharrem* comes on *Cuma*, June 17. This day was given according to the *Rumi* Calendar. They give a date that after eleven days from the *Miladi* (Gregorian) calendar. Also, in these dates, no year number was given.

The second newspaper among the Muslims in the Ottoman was *Ceride-i Havadis*, first published in 1840. In volume 49, the newspaper gave the *Rumi* calendar in response to the *Hicri* calendar and to give the weather conditions according to publishing days. The *Hicri* and the *Rumi* days were presented for comparison. However, in this case as well, no year number was given in these tables, such as 5 *Recep* 1257 = 10 *Ağustos Pazar* (this date occurred in 1841 AD).

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[138] Unat, p. 160.

As mentioned above, the newspapers in the first period gave the dates according to the *Hicri* calendar. However, they did not make much of an effort to give the *Rumi* dates. Akgür writes that this can be seen in the effort to make the *Rumi* calendar accepted by Muslims. In that period, the Ottoman officials and intellectuals were trying to change the calendar system from the *Hicri* to the *Rumi*, which they felt was more suitable to Western types of time conceptions. The Ottomans had been unfamiliar with the *Miladi* (Gregorian) calendar for four centuries. However, the *Rumi* calendar had been in use by the *Müneccimbaşı* calendar. The *Rumi* (the Alexander and the Julian) calendar was known by the Ottomans as the calendar of the Christian who lived in the Ottoman Empire. The Alexandrian calendar, used by the Syrians, and the Julian calendar, used by the Christians who lived in the western parts of the Ottoman Empire used the same month names. There were differences only in its reckoning of New Year Day and its year number.[139]

The second issue of *Tasvir-i Efkar*, published on 5 *Muharrem* 1279 Wednesday = 20 June, was given with the *Rumi* calendar, although no *Rumi* year was given. In *Takvim-i Vekayi* newspaper, only the *Hicri* calendar was until used in the first 736 volumes. In the 736th volume, on 14 Ramadan 1280 = 9 *Şubat* (February), there was not only the day name, but also the number of the *Rumi* year. In the same period, in *Ceride-i Havadis*, the date is given according to the *Hicri* calendar. For these reasons, according to Akgür, the introduction of the *Rumi* calendar into practice in the Ottoman Empire can said to have begun in the 1860s.[140] However, in this period, the *Rumi* years were not used.

[139] A.Necati Akgür. "Osmanlı Mali Yılı," *Türk Dünyası Araştırmaları* 102 (Haziran 1996), p. 71.
[140] Ibid, p. 72.

The *Rumi* year began to be used in the newspaper *Vakit* on 1 *Zilka de* 1292 *Salı* = 18 *Teşrin-i Sani* 1291 = 30 *Teşrin-i Sani* 1875.[141] Nevertheless, the *Rumi* calendar was not found in *Hicri* 1304 (1887) in the newspaper of *Tercüman-i Hakikat*. For example, it writes the date on 1 Ramadan 1304 *Salı* (Tuesday) = 12/24 Mayıs (May) 1887 the volume of 3687th. Therefore, we can say that *Rumi* calendar use was widespread after 1875 and that a tendency toward the Gregorian calendar had begun.

According to Akgür, the *Rumi* calendar was put into practice after the 1860s. He bases his claim on books that were translated from the *Rumi* and *Hicri* calendars to the *Miladi* calendar were begun in the Ottoman financial Year from 1677, such as *Riyaz ul-Muhtar*, which was written by Ahmet Muhtar Paşa in *Hicri* 1303 (1887); *Tables de Concordance des Dates des Calendriers*, written by Emile Lacoinein Paris in 1891; and the book of *Tableaux pour la Coincidence des Dates*, by A. Bacolla in Constantinople in 1910. Later, it was used in 1840 by Ahmet Muhtar Paşa in his book *Takvim üs-Sinin* in *Hicri* 1331 (1915).[142]

In his discussion on the beginning of the *Rumi* calendar, Unat says that,

> I have not made the beginning of the *Rumi* calendar in the Ottoman definite. It was published in the first printing *Düstur* on page of 279 published in 1279; there was the *Hicri* calendar on September 1, 1855. In addition, there was only the *Hicri-Kameri* calendar in the financial records before the acceptance of the *Kanuni Esasi*. After the proclamation of the constitution, there were calendars, the *Hicri-Kameri* and the *Rumi* calendars are used in the records. For these reasons, it can be said that the use the *Rumi* calendar together with the *Hicri-Kameri* calendar became a rule during the reign of Abdülhamid II.[143]

These two assertions argue different dates for the beginning of the *Rumi* calendar. It seems most likely that the claim of Akgür is more accurate than that of Unat because, if there was an *sıvış year* in *Hicri* 1287-1289, which was forgotten by

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[141] A. Necati Akgür, "Rumi ve Miladi Takvimler-V," *Toplumsal Tarih* 63 (Mart 1999), p. 54.
[142] Akgür, "Osmanlı Mali Yılı," p. 72.
[143] Unat, p. 163.

the Ottoman officials and caused problems in the Ottoman financial system, the *Rumi* calendar came into use in the 1860s. However, this usage was not understood at every level of the Ottoman state. The *Rumi* calendar was used in financial matters, but its name was not used in the official records. For instance, the *Rumi* calendar was used to records birthdays, building construction dates, institution founding days, on the registration of title deeds, and in the press. It was significant in matters relating to the law.[144]

In the calendar science literature of the Ottoman Empire, the calendar with 365 ¼ days and a solar circle was called the *Rumi* calendar. There were many types of the *Rumi* calendar; at least three are well-known. The first one was the Julian calendar, the second the Alexandrian calendar, and the third the Coptic calendar.[145] The *Rumi* calendar in the Empire copied from the Julian types of calendar that was used among the Christian subjects. It resembles the Julian calendar. That is, February of the financial year contained twenty-nine days while February contained twenty-nine days in the Julian calendar. The main differences are the New Year Days, which starts in March, and the number of the year.

The Ottoman financial year was a solar year that used the *Hicri* year number and contained 365¼ days. This calendar was based on two main principles. The first principle was *Medhal-i Azer*, that is to say, the year began from March, and New Year's Day was 1 March. Also, if 1 March was equal to the *Hicri* year, the numbering of the Ottoman financial year took this year number. For example, if 1 March fell in *Hicri* 1285, the financial year number was 1285. The second principle was the rule of the *Sıvış Year*. The first financial year was in 1840. This year was equal to 9 *Muharrem* 1256 =1 Mart (March) 1256, and the financial year number was 1256.

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[144] Unat, p. XIV.
[145] Akgür, "Osmanlı Mali Yılı," p. 73.

This financial year was in the 1256 *Hicri* year, but only eight days remained in the 1257 *Hicri*. The second financial year began with 19 *Muharrem* 1257 (1841) and its year number was 1257 Mali. After thirty-three lunar (the *Hicri*) years, one year increased in the solar (the *Rumi*) year. Thus, the *Rumi* year of 1288 was included in the *Hicri* year of 1287-1288-1289.

The *sıvış* year was applied in financial issues only on the state level before the *Rumi* year 1288. In the Ottoman Empire, the *sıvış* years of 1255 and 1288 were forgotten, and the *sıvış* year of 1328 was due to negligence or forgetfulness. Consequently, a gap of two years emerged between the *Hicri* and *Rumi* calendars. For this reason, during the discussion on that year's budget, Ahmet Muhtar Paşa emphasized that this difference between the *Rumi* calendar and the *Hicri* calendar would only increase. He then presented his project on a new calendar system for the Ottoman State to the Ottoman parliament.[146]

Some years later, *Başmüneccim* Tahir Efendi charged a commission which composed of Ahmet Cevdet Paşa and Vidinli Tevfik Efendi, who was a well-known mathematician and soldier; and the people who were known as specialist on calendars during period, to solve the *sıvış* year problem. The commission suggested that the *sıvış* year principle had been upset and that all of the records that the state had issued had the dates wrong. It would be impossible correct all of the records. For this reason, the *sıvış* year application should be abolished. Henceforth, the *sıvış* year application fell into disuse.[147] According to Ahmet Muhtar Paşa, the deficit had arisen from the fact that the *Rumi* calendar was started from a suitable date because in every society, the calendar was started on its own religious or civilization basis. For this reason, he

[146] Sahillioğlu, p. 231.This proposal can be seen at the appendix, p. 157.
[147] Ahmet Muhtar Paşa, *Islahat ut-Takvim*, pp. 28-34.

claimed that if the *Rumi* calendar were started on a suitable date, there would be no problem in this issue.[148]

Sahillioğlu summarizes how the problem of the *sıvış* year was solved in fiscal matters and he claims that the crisises of Ottoman history can be *understood* with the *sıvış* year. He maintains that the analysis of the *sıvış* year is a useful key for it explains Ottoman history. In addition to this, I believe that research into other Islamic States in history which had two calendars in accounting should be pursued.[149] He gives some examples of the Ottoman budgets in his article.[150]

We can summarize the application period of the *Rumi* calendar in the Ottoman Empire. In the early period, the treasury used a financial calendar based on the solar circle. In *Hicri* 1087 (1676 AD), the *Rumi* calendar began to be used in the customs, however, it was not called the *Rumi* calendar, but the fiscal year and it was used throughout the administration. Although the *Rumi* calendar was put into practice in the Tanzimat period, it was used only by some newspapers and in some records. After the Meşrutiyet, the *Rumi* calendar became the official one used in the Ottoman Empire.

Moreover, some writers claim that the *Rumi* calendar starts from the birth of Prophet Mohammed in 584 AD and that the deficit was caused by their wrong calculation.[151] They subtract the *Rumi* calendar from the Gregorian calendar. Both of them are solar calendars; however, the *Rumi* calendar year number comes from the *Hicri* calendar. Therefore, the difference between the *Rumi* and the Gregorian calendar was approximately 622 years.

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[148] Ahmet Muhtar Paşa, Sene-*i Maliyenin Hicri Sene-i Şemsiye ile İstibdaline Dair* (Konstantiniye: Matba-yı Ebuzziya, Hicri 1328), pp.9-10.
[149] Sahillioğlu, p. 237.
[150] Sahillioğlu, p. 238-49.
[151] *Yeni Türk Ansiklopedisi*, "Takvim" vol.10 (İstanbul: Ötüken Yayınları, 1995), pp. 3935-6

The *Hicri-Şemsi* Calendar in the Ottoman Empire

During the period of the application of the *Rumi* calendar, some people dated months like *Mart* (March), *Nisan* (April) which were *Rumi* calendar months, with the *Hicri* years. At this time, the dating of the day could be the *Rumi* or the *Miladi* (the Gregorian) method. New Year's Day was in *Ocak* (January) or *Mart* (March). Because of the fact that some records do not have the year number, some problems were caused. For example, *Temmuz* (July) 25, the *Rumi*/Financial 1274 = *Ağustos* (August) 6 the *Miladi* 1858; *Temmuz* (July) 25, The *Hicri-Şemsi* 1274 = *Ağustos* (August) 6, the *Miladi* 1895.[152] The *Rumi* calendar was a type of *Hicri-Şemsi* calendar.

The Criticisms of the Ottoman Financial Year

Criticisms of the Ottoman financial year started at the beginning of this calendar practice. The first criticisms were made by Ahmet Cevdet Paşa in his book *Takvim ul-Edvar*, which was published in *Hicri* 1287 (1870/1 AD). He described the negative points of the financial year and how it should be changed. He presented ancient calendars, much as the *Hicri*, the Jewish, the ancient Persian, the Alexandrian, the Julian, the Coptic, and the *Celali* calendars and their dating methods. In discussing the *Rumi* calendar, he said that, "in history, some societies have used solar years with lunar months, such as the Jewish calendar. This practice has caused some problems. The aim of producing a calendar means abolishing some problems with time measurement. This practice was the cause of some questions."[153] He maintained a

[152] Akgür, "Rumi ve Miladi Takvimler-V," p. 58.
[153] Ahmet Cevdet Paşa, *Takvim ül-Edvar* (Kontantiniye, 1287), pp. 45-6.

document which served as proof of a business transaction that had taken place in the *sıvış* year. Because the *sıvış* year number was available; however, indeed there was no this year in this calendar.[154]

The second criticism was raised by Ahmet Muhtar Paşa in his book *Riyaz ül-Muhtar* published in *Hicri* 1303 (1886 AD). He said that, "it seeks to put the large in the small, like that the *Hicri* year, which is composed of 354 1/3 days included in the period of the solar year which is composed of 365 ¼ days. That is to say, it tries to fit a house into a room. And he shows as an example, *Rumi* 1287 and *Rumi* 1302. He explains the event of *sıvış*, that transformed the confusion into the complex [*müşevveşi teşviş ya da teşvişi müşevveş etmek*]."[155]

The third criticism was made by the Ahmet Şakir Paşa in his book *Sene-i Maliye Hakkında Mutaleat*, published in *Hicri* 1308 (1892 AD). He wrote that "the Ottoman fiscal year is an inappropriate calendar. It is like trying to put a chest into a small box."[156]

The criticisms of the Ottoman fiscal year emphasize that the *Rumi* calendar is not suitable for the Ottoman financial system. The *Rumi* calendar was used to solve taxation problems with the *Hicri* calendar, which was not suitable for natural events. This new calendar was suitable for the seasons; however, the usage method in the Empire caused some new problem in the year number system. The intellectuals who were interested in the calendar issue in the Ottoman Empire suggested that if the government wanted to constitute a new calendar system that was suitable for the season, it can be formed as a real solar calendar based on the solar cycle and Islamic principles.

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[154] Ibid., p. 48.
[155] Ahmet Muhtar Paşa, *Riyaz'ul-Muhtar* (Konstantiniye, 1307) pp. 356-7.
[156] Ahmet Şakir Paşa, *Sene-i Maliye Hakkında Mutaleat* (Konstantiniye: Matba-yı Ebuzziya, Hicri 1308), pp. 14-5.

The Suggestions for Calendar Reform in the Ottoman Empire in the Late Period

In the Ottoman state, when problems emerged with the calendar system, especially in the *Rumi* calendar system that was used in the financial system, scholars who studied the calendar system tried to solve the problem. They prepared proposals about the calendar system. Discussions appeared in the newspapers and books were published on this issue. In this part, the calendar proposals in the Ottoman Empire in the late period are summarized.

The first criticism was raised by Ahmet Cevdet Paşa. He wrote *Takvim ul-Edvar* in *Hicri* 1287 (1870/1). He declared that,

> We need a solar calendar with the *Hicri* calendar today. This should be the *Celali* calendar that has been produced in the Islamic tradition. However, it should be started from the Hegira, which is the movement of the Prophet Muhammad from Mecca to Medina. Its New Year Day should be the arrival day of Muhammad to Medina that is the autumn equinox (23 September). It was showed by *Müneccimbaşı* Tahir Efendi some times ago. In spite of the fact that the New Year's Day in the *Celali* calendar is *Nevruz*, it is appropriate to bring this date to the autumn equinox with respect to balance the budget and preparing for winter. As for the months, the months should be composed according to the twelve Zodiacs. Thus (to begin with from September 23), the zodiacs months of *Terazi, Akrep, Yay, Oğlak, Kova*, and *Balık* should be 30 days; the zodiacs months of *Koç, Boga, İlkizler, Yengeç*, and *Aslan* should be 31 days, the last month *Başak* should be 30 days in every three year and 31 days in forth year. The month names should be *Eylül* (September), *Ekim* (October) etc. however, the beginning of the months should not be *Eylül* (September) 23, it should be taken three weeks early or postponed one week later.[157]

Ahmet Muhtar Paşa, in *Riyaz ul-Muhtar* in *Hicri* 1303 (1886), critiqued the calendar system and the fiscal practices in the Empire. Also, he shows some faults in the *Rumi* year. He supported Ahmet Cevet Paşa views about calendar issues.[158]

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[157] Ahmet Cevdet Paşa, *Takvim ül-Edvar*, pp. 47-51.
[158] Ahmet Muhtar Paşa, *Riyaz'ul-Muhtar*, pp. 357-9.

Ahmet Muhtar Paşa wrote a new book about this issue, *Islah ut-Takvim*, in *Hicri* 1307 (1889/90). Actually, this book was a conversion of a calendar book from the *Hicri* calendar to the *Rumi/Miladi* (Gregorian). However, he demonstrated his opinions about the calendar issue. In the introduction, he criticized the *sıvış year* practice in the Ottoman fiscal year and he supported his argument with the Solar-*Hicri* calendar. In this calendar, the year began with the day Muhammad arrived in Kuba in 22 September, 622 AD. The month names are *Harif-i evvel*, *Harif-i sani*, *Harif-i salis* (the autumn months I, II, III); *Şita-i evvel*, *Şita-i sani*, and *Şita-i salis* (the winter months I, II, III); *Bahar-i evvel*, *Bahar-i sani*, and *Bahar-i salis* (the spring months I, II, III); and *Sayf-i evvel*, *Sayf-i sani*, *Sayf-i salis* (the summer months I, II, III). The months of autumn, winter, and spring had thirty days. The months of summer I and II had thirty-one days and the month of summer III has 30/31 days.[159]

In *Hicri* 1328 (1910 AD), Ahmet Muhtar Paşa published *Sene-i Maliyenin Sene-i Şemsiye ile İstibdaline Dair.* In this book, he said that, "I renounce my claim to the New Year's Day in the new calendar that accepts 1 January, 622 AD instead of my old argument that the New Year Day should be the arrival day of the Prophet Muhammad to Medina which is the same day as the autumn equinox. It is started in January and its extra days should be in *Miladi* (Gregorian). Moreover, the month names and their periods should be the same."[160] These claims are the same as the *Miladi* calendar that was adopted by the Republic of Turkey.

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[159] Ahmet Muhtar Paşa, *Islah ut-Takvim*, pp. 3-15.

[160] Ahmet Muhtar Paşa, *Sene-i Maliyenin Sene-i Şemsiye ile İstibdaline Dair*, pp. 5-20.
He summarizes his suggestions that "Hulasa-ı Kelam;
1-Elyevm mevki-i isti'malde olan sene-i maliye tarihi bihakkın ilgaya seza olduğundan onun lağvı farz-ı ayindir.
2-Vuku-u Hicret-i Hazret-i Nebevi'den 263 gün evvel geçen 622 sene-i miladiye mebdei olan (javiye) Kanun-i Sani nin birinci günü bizce de ilk sene-i hicriye-i Şemsiyeye mebde ittihaz edilerek sene-i mezkure birinci sene-i hicriye-i Şemsiye itibar ve onu veli eden seneler ona göre ta dad ve tezkar (anma) edilmelidir.
3-Aylarıyla günlerinin a dad-ı eyyamı mülga sene-i maliye ay ve günlerinin aynı kalacaktır.

As part of the calendar discussions, Ahmet Şakir Paşa published a book called *Sene-i Maliye Hakkında Mutaleat* in *Hicri* 1308 (1892 AD). In the introduction, he explained his ideas about the calendar he felt should be accepted by the Ottomans, and then he presented the year of 1321 (1891/1892 AD) as the *Güneş-Mevlit* year (the sun-the night of the birth of Prophet Muhammad).[161] He claimed that "the new calendar should be suitable for the familiarity, thoughts, and morality of the *avam* (the common people) and the *havas* (the elite people)."[162] He recommended a calendar from 571 AD, the birth date of the Prophet Muhammad. Its New Year Day should be the vernal equinox, *Miladi* Marc 21. The month names would be *Azer* (March), *Hızır* (an immortal being reputed to come to the rescue of those in deep distress), *Hudra* (the greenness) – *Basyaz* (beginning of summer), *Bahur* (the hottest month in the summer), *Ab* – *Hazan*, *Kasım*(November), *Teşrin-Zemherir* (the dead of winter that is, the forty days between 22 December and 30 January) , *Kanun*, and *Cemre* (any of three radiations of heat which supposedly fall in succession from the sun into the air).[163] In the main part of the book, he presented letters about calendars which had been written by Ahmet Muhtar Paşa, Ebüzziya Tevfik and himself in which they criticize the Ottoman fiscal year and they suggest a European calendar in indirect ways.

The new calendar suggestions that appeared some newspapers and books can be classified into two main proposals. The first proposal was that the Empire had to prepare a new solar calendar based on Islamic principle. As mentioned above, some

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4-Usul-ü kebisesi tarz-ı atıyk-ı miladi usul-ü takviminde olmayıp tarz-ı cedid-i miladi usulüne tabi olacaktır.
5-Tarih-i Kamerimiz dini bir tarih olarak kema kan edeceğinden tarih-i Şemsi ile tarihi Kamer-i bütün defatir ve muharreratta bir vakte kadar ikisi birden kullanılmak mecburi olmalıdır. Çünkü bir vakte değin rakamları mükerrer geçmesi tabi i olan tarihi Şemsi ile sene-i maliye tarihi beyninde iltibası (benzeme) bu veçhile men etmek zaruridir." pp. 26-7.

[161] Ahmet Şakir Paşa, *Sene-i Maliye Hakkında Mutaleat*, p. 15.

[162] Ibid., p. 21.

[163] Ibid., pp. 21-30

authors suggested that this calendar could be designed according to the old Turkish or old Islamic calendar like the *Celali* and the *Mutazıd* that was composed by the Abbasids. These authors evaluated the calendar subject as a civilizational issue or they did not want to use the other calendar which was organized according to a different religious basis. The second proposal was that the Empire had to adopt its calendar system from the western types of calendar, that is, the Gregorian calendar. At this point, these writers tried to synchronize the Empire with the Western world. Apart from this, these authors did not suggest their proposals clearly; they tried to explain their idea with sophisticated methods like other modernist people in the same period.

Calendar Usage in the Ottoman Empire

The calendar was the first major institutions that man invented in order to establish and maintain temporal regularity. Zerubavel writes that, "the calendar is primarily responsible for the creation of most of temporality regular patterns through which nearly all societies, social institutions, and social groups manage to introduce some orderliness into their lives."[164] As Durkheim asserts, "a calendar expresses the rhythm of the collective activities, while at he same time its function is to assure their regularity."[165] Every society has used a calendar system based on their own principles to order social and religious activities. In the Ottoman Empire, the *Müneccimabaşılık* prepared the calendar to determine social, economic, and religious activities. The *Müneccimabaşı* calendar, as mentioned above, contained different kinds of calendars. The main calendar was the *Hicri* calendar. Beside this, it contained the *Halk*, the

[164] Zerubavel, *Hidden Rhythms*, p. 31.
[165] Durkheim, *The Elementary Forms of the Religious Life*, p. 23.

Celali, the Julian, the Alexander calendars. How the synchronicity in Ottoman society was achieved with different calendars. However, the main calendar was the *Hicri* calendar. Also at the fiscal level, the government used the natural calendar to collect the taxes. The *Halk* calendar was used by the people to determine time without any professional tools or studies. People can/could determine the time to observe the natural events. Non-Muslim people used their religious calendar to determine the religious festivals and fest days. Every calendar was used in its own geography. For this reason, no problem occurred in the same society. Also, before the industrial age, the synchronicity was not important in daily life. Synchronicity became important, after the daily schedule spread to all levels.

The constituting of the *Rumi* calendar can be analyzed as the secularization of the calendar in the Ottoman Empire. The *Hicri* calendar was the official calendar; however, the economic issue was solved by the *Rumi* calendar. The humanization of the calendar could be made by the fiscal level. Because the *Rumi* calendar did not contain religious date, it was used only for economic issues; however, the original *Rumi* calendar was the Julian calendar that had Christian features. Indeed, the *Rumi* calendar was begun to use after the middle eighteenth century. That is, the modernization period in the Empire affected the calendar at the economic level. All of these, the Empire did not adopted the Gregorian calendar in any times.

The other interesting feature of the *Müneccimbaşı* calendar was that it gave the lucky and unlucky days according to astrology. The *Müneccimbaşı* calendar did not show only dates or number, it showed the lucky days. The *Hicri* calendar was not interested in the days lucky or unlucky, but only in the days according to Moon position. Also, in the Islamic calendar concept, there was no type of dating method. This shows that lucky and unlucky days came from the other calendar system to the

Ottoman. For example, the *Müneccims* determine the "*eşref saati,*" according to the stars positions. We can understand from these examples that the Ottoman calendar system, based on religious principles, not only Islamic tradition but also the other astrological one.

The *Halk* calendar was an important calendar in the rural areas from the ancient times. This calendar was the first universal calendar in the world. The *Halk* calendar contains the natural cycle of nature. The natural events are called differently according to the language and culture. Also, people put different religious meaning on the same natural dates or events. For example, in the spring, the Muslims prepared "*aşure*" (pudding made with cereals, sugar, and raisins) to commemorate the murder of Hüseyin, who was the son of Ali, who was the fourth caliph of the Islam. In Islam, the religious days are determined according to the *Hicri* calendar, which is based on the lunar circle. However, the *aşure* date comes in spring. That is, the *aşure* dating is calculated according to solar circle. Also, in the Orthodox Christianity, the *aşure* was prepared on the same date as the Muslims. For these reason, we can say that the *aşure* date is a date of the *Halk* calendar, like *Hıdırellez*.

The *Halk* calendar, indeed, was based on natural principles; however, the people gave different meaning to this calendar according to their culture. For this reason, this natural calendar gained the religious meanings. The difference in the *Halk* calendar can be seen among different ethnic or religious groups who live in the same society, like the Ottoman Empire.

As mentioned above, the *Müneccimbaşı* calendar was used among the officials for hundred of years. The ordinary people used the Folk calendar which was based on the seasonal changes, and the Muslims followed the *Hicri* calendar to determine the important religious times. Until the nineteenth century, in the Empire, the ordinary

people did not use a written calendar or timetables; they learnt the time from nature and the mosques from which the five prayer times were announced every day.

After the nineteenth century, technical improvements became widespread and they brought changes on their living styles. The production styles, transportation and communication technology caused a new world of mechanical tools to come into being. In the Empire, the calendar system began to use by the westernized intellectuals who had gone to Europe and merchants who worked with the European countries.

In the newspapers about 1850, two or three calendars appeared at the top of the front-page. The Ottoman people, also, used different calendar systems in the same society. With the development of trade with the European countries, the synchronization problem began to be experienced between the Ottoman merchants and the Europeans ones. For this reason, most commercial fields, traders used the Gregorian calendar to synchronize with the outside of the Empire. However, the official calendar was the *Hicri* calendar. Furthermore, the *Rumi* calendar was used; however, it was not official. The *salnames* were dated as the *Hicri* calendar until end of the empire.

Calendar publishing among the Ottoman Muslims began in 1847. In these years, the *salnames* (year books) of the state and provinces were prepared by the government. However, these were not calendars. Calendar publishing for Ottoman Muslims, especially the ordinary people, began after the 1870s. The use of calendars in daily life was only by Ottoman westernized intellectuals, who used the calendar on their schedules and manuscript like their memoirs.

The most well-known calendar among the Ottoman Muslims was the *Ebüzziya* calendar. Ebüzziya Tevfik Bey published his first calendar under the title of *Salname-*

i Hadika in March 1873. This was a kind of almanac and it contained some general information such as a *Tarih-i Takvim* (history of calendars), and *Mukaddime* (introduction).[166] In 1879, he published *Salname-i Ebuzziya*. This calendar noted the last year's events; his calendar was recalled by Abdulhamid II because the Ebüzziya Tevfik included the exile day of Süleyman Paşa, who had been exiled by the Sultan.[167] He kept publishing calendars until 1900. Their titles were *Salname-i Kameri* (1297/1880), *Rebi-i Marifet* (1297-1305/1880-1888), *Takvim-i Rebi*, *Zamime-i Rebi-i Marifet* (1302/1885), *Nevsal-i Marifet* (1306-1310/1888-1893), *İmsakiye-i Nevin* (1309/1892), *Takvim-i Ebüzziya* (1311-1316/1893-1899), and *Takvim ün-Nisa* (1317/1900).[168]

The most interesting calendar published by Ebüzziya Tevfik Bey was *Takvim-ün Nisa*. In this calendar, he mentioned *Feminizm* (feminism), *Kadın Okuyup Yazmalı mıdır?* (Should Woman Read and Write?). This was the first calendar in the Empire prepared for women.[169] The calendars contained some information about its subject in this period. *Tavim-ün Nisa* was prepared as a calendar and it contained feminist articles and slogans.

In addition, Yusuf Akçura and Gaspıralı İsmail Bey requested a calendar for Russian Muslims from Ebüzziya Tevfik. He prepared a calendar under the title of *Rusya Müslümanlarına Mahsus Takvimi Ebüzziya* in 1885 (*Hicri* 1302).[170]

The Ebüzziya calendars stopped being issued in 1909. After 1943, Ziyad Ebüzziya, the son of Ebüzziya Tevfik Bey, began to publish the Ebüzziya calendar with a committee, the members of which were Tahir'ül Mevlevi, Ömer Rıza Doğrul,

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[166] Ömer Faruk Şerifoğlu. "Unutulmaz Efsane 1873-1969 Ebüzziya Takvimleri," *Cogito* 22 (Bahar 2000), p. 146.
[167] Ibid., p. 149.
[168] Ibid., p. 149.
[169] Ibid., p. 150.
[170] Ibid., p. 149.

Kamil Miras, Ercüment Ekrem Talu, Cihad Baban, Bahadır Dülger and Eşref Edip. These calendars, prepared as a daily newspaper, were published until 1969. In the second publishing period, the calendars published 28 volumes. The last calendar committee was made up the following individuals; Ebüzziyade Velid, Prof. Kamil Miras, Ömer Rıza Doğrul, Abidin Daver, Ercüment Ekrem Talu, Sermet Muhtar Alus, Ziya Şakir, Peyami Safa, Tevfik Sadullah, Adnan Aral, Vala Nurettin, Bahadır Dülger, Ziyad Ebüzziya, Prof. Salih Cemil, Reşat Ekrem Koçu, Eşref Edip, Hasan Ali Ediz, Kandemir, Tahir Olgun, Ali Esin, Ali Tevfik İnci, Samih Nafiz Tansu, Prof. Nusret Aktan, associate professor Muammer Dizer, V. Emircan, associate professor Sami Alören, Dr. Sedat Ergin, Lokman Hekim, H. Karakaş, Müneccimbaşı and Saim Alpkurt.

The second well-known calendar was the *Saatli Maarif Takvimi*. This calendar was published by Naci Kasım in the *İstanbul Maarif Kitaphanesi*. It contained the *Hicri* and the *Rumi* calendars, the prayer times in hours and minutes, and articles on many subjects to instruct the reader. Also, it gave the *Halk* calendar information, daily menus for women, anecdotes, poetry, and some information on the cultural or political establishment. The *Saatli Marif* calendar has been prepared since 1900.[171]

At the end of the nineteenth and beginning of the twentieth centuries, the Galata merchants, who were non-Muslim for the most part, used modern calendars and they printed their own commercial calendars. The Muslim merchants who wanted to work according to the modern rules followed these merchants and began to publish their own commercial calendars. The commercial calendars were called "*Aygün Takvimleri*" and were published as advertisement. One example of this kind of calendar was a calendar that was published by *Saadet Kırtasiye Matbaası. Muallim*

[171] Artun Ünsal. "Saatli Maarif Takvimi –Gelenekçi, Laik ve Modern-," *Cogito* 22 (Bahar 2000), pp. 153-9.

Abdülkadir Bey and his sons Necati and Memduh established the stationery in 12 Nisan 1324 (25 April 1908) at Vezneciler. They published the first *Aygün* calendar in 1912 and continued calendar publishing until 1945. The calendars contained some advertisement about the stationary and gave some useful information for the merchants.[172]

The Calendar Reform in the Ottoman Empire

In the Ottoman Empire, until at the end of the empire, the *Hicri* calendar was used on the official level. The *Rumi* calendar was used on the fiscal level and for such dates as birth dates, building construction dates, and deed dates. In 1917, the Ottoman parliament abolished the *Rumi* calendar and introduced a kind of Gregorian calendar with an article that declared that "the Ottoman State in applications accepts the *Takvim-i Garbi* (the western calendar) except the beginning of the western calendar, and the *Hicri* calendar will still be used." Thus, "it was accepted that 16th day of February in 1332 was considered March 1."[173] In this way, they abolished the gap day between the *Rumi* calendar that worked with Julian methods and the *Miladi* calendar that worked with Gregorian methods.

Adding thirteen days to the new calendar filled the gap between the calendars. However, this application did nothing to change the year number, which remained

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[172] Emin Nedret İşli, "Aygün Takvimleri" *Cogito* 22 (Bahar 2000), pp. 160-6. This writing is at the top of the first *Aygün* calendar; "Bu dördüncü sene-i ticaretimizdir. Sene-i ticaretimizden ziyade de sene-i tecaribimizdir. Dört sene zarfındaki terakki-i muzaafımız ise sırf muhterem müşterilerimizin eser-i teşvik ve rağbetidir. Teşekkür ederiz. Bu tecarible anladık ki ticaret istikamet, satışta az kara kanaat tevali-i müracaatı mucib yegane saik-i rağbet imiş. Şimdi de muhterem müşterilerimizin teveccühlerine bir kat daha izhar-ı liyakat için bu küçük ruznamçeyi tertib ettik.
Her zaman teceddüt eden çeşitlerimiz günden güne artan gayretlerimizle her an bir devre-i nevin gösterdikçe bu hatırgüzar naçizimiz de tenevvu ve tevali ederek ticarethanemizi rağbetkaran-ı muhterememize hatırlatacağını ümid ederiz." p. 161.

[173] "Muamelatı Devlette Takvimi Garbinin Kabulü hakkında Kanun," 28 Rebi-ül Ahir 1335 / 8 Şubat 1332, *Düstur*. 2. tertip no.125, C. IX, p. 185. (This law quoted from Akgür, "Osmanlı Mali Yılı", p. 80 and Unat, p. 163.)

1300. Moreover, New Year's Day was not altered; it continued to be in March. In this way, the new calendar was unique in the world. Berkes evaluating the calendar reform in the Empir, writes that "the mixed calendar system was maintained until second *Meşrutiyet*, like the *Nizam-ı Cedid*. The attempt that was made after the second *Meşrutiyet* ended negatively because of the conservatism of the *Ayan Meclisi*."[174] The duality on the calendar systems was maintained until the end of the Ottoman Empire. The new reform did not end the confusion in dating systems.

At the top of the some newspaper, there were three calendars: the *Hicri*, the *Rumi*, and the Gregorian. In daily life, people could use these different calendars according to the newspapers and the printed calendars.[175]

During the calendar reform discussion in the *Ayan Meclisi*, some people suggested that the Parliament should accept the Gregorian calendar, thus, the Empire could have a calendar suitable for a world calendar system; however, this proposal was not accepted by the Parliament. The Parliament accepted the basic principles of the Gregorian calendar; however, they changed the year number system. Although the Parliament wanted to change the calendar system and solve the synchronization problem, it caused new problems for the Empire. However, it is interesting that some Ottoman newspapers which were not only Muslim but also non-Muslim gave the Gregorian date with the *Hicri* and the *Rumi* calendars before the calendar reform. That is, people used the Gregorian calendar in daily life and they solved the synchronization problem in the trade.

In *Tasvir-i Efkar* newspaper on 28 *Sefer* 1334 (*Kanun-i Sani* (January 1917), the acceptance of the *Takvim-i Garbi* was evaluated. In this article, the writer summarized the formed period of the *Hicri* and the *Rumi* calendar and presented the

[174] Berkes, *Türkiye'de Çağdaşlaşma*, p. 548.
[175] For more information look at the Ottoman newspapers that were published before acceptance of the *Takvim-i Garbi* by the government such as *Tasvir-i Efkar*.

problem of the *Rumi* calendar at the state level. He wrote that the Ottomans had accepted the Julian calendar that was used by the Orthodox Christians; however, it had not accepted the Gregorian calendar. This is an interesting argument within the calendar discussion, because two of them are Christian calendar, that is, the Ottoman officials could accept the Gregorian calendar as a solar year. And it was more suited to the seasons than the Julian calendar that inspired the *Rumi* calendar.[176]

The first calendar reform in the Empire was the composed of the *Rumi* calendar. The second one was the acceptance of the *Takvim-i Garbi*. The first one was formed, at the beginning of the eighteenth century, to achieve a calendar that was suitable to the seasons. The second one was accepted to synchronize the Empire with the world, especially the European countries. However, these two reform movements did not achieve their aims. Because the first one copied from the Julian calendar it was not suitable for the seasons. For this reason, the Pope Gregory made a reform on this calendar and the Ottomans gave the *Hicri* year number to this calendar system that caused the *sıvış* year problem in the late period.

The second reform introduced a unique calendar to the world because of its *Hicri* year number; it solved only the eleven days gap in the *Rumi* calendar that came from the Julian calendar. We can say, about this reform mentality, that this approach tries to solve the problem, but they do not accept the reforms on all levels. They accepted the reforms only with their needs, causing a duality in the reforms like the laws and education.

There were three different calendars at the top of the newspapers. This is indicative of the Empire's calendar mentality. People could use different calendar systems in the same society and it does not cause any problem with synchronization.

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[176] *Tasvir-i Efkar*, 28 Sefer 1334; Kanun-i Evvel 1331; Kanun-i Sani 1917.

People could use different calendar systems according to their needs. For example, in rural areas, a Muslim determined the religious times according to the *Hicri* calendar and he could realize the *Halk* calendar from natural events. Moreover, he could pay his taxes according to the *Rumi* calendar. In the city life, people could determine the religious times according to their own religious calendar and they could realize the date according to their needs. If they needed to learn the *Rumi* calendar or the Gregorian calendar, they could learn from the newspaper and printed calendars.

Using all of these calendars in the same society caused problems at the governmental level. People could solve their personal problem at the personal level; however, in the governmental level, these calendars caused synchronization problem in the records and agreements between the other states.

The calendar reform in the Empire caused a new synchronous problem with the world. Because this reform did not produce an original calendar, some Ottoman writers suggest a new solar calendar suitable to the seasons and the beginning of the Hegira.[177] This reform caused a duality in the calendar usage in the Empire because most records, especially birth records, were written according to the *Rumi* calendar until 1926 and were registered in different systems.

[177] Ahmet Muhtar Paşa. *Sene-i Maliyenin Sene-i Şemsiye ile İstibdaline Dair*, pp. 5-20.

CHAPTER III

THE CALENDAR IN THE REPUBLIC OF TURKEY

After the establishment of the Republic of Turkey, the *Müneccimbaşılık* was abolished in 1924 and the duty of the measurement of the calendar was given to the *Başmuvakkitlik.* Ahmet Ziya Akbulut, who was appointed to this position by the government in 1925, prepared the *Hicri* calendar with Hüseyin Hilmi Efendi, who was the last *Münnecimbaşı.*[178] In 1926, a law was passed by the government instituting a calendar revolution in the Republic of Turkey, the *Takvimde Tarih Mebdeinin Tebdili Hakkında Kanun* (the law about the beginning of the calendar), on 26 December 1925. The first paragraph of the law states that, "in the Republic of Turkey, the beginning of the international calendar as the beginning of the calendar in the State official calendar has been accepted." The second paragraph states that "the day which followed the *Kanuni Evvel* (December) 31 in 1341 is the day of *Kanun-i Sani* (January) in 1926." The third paragraph says that "the *Hicri-Kameri* calendar has been used in special situations for a long time. The beginning of the *Hicri-Kameri* months is determined officially by the *Rasathane* (observatory)." "The law went into effect from the date of its publication. The body responsible for implementing the law was established to be the *İcra Vekilleri* (the Council of Ministers)."[179]

Afterwards, the *beynelminel takvim* (the international calendar) was accepted. Moreover, the duty of preparing the *Hicri* calendar for special religious days was given to the the observatory in Kandilli.

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[178] Cumhure Üçer. "Türk-İslam-Osmanlı ve Cumhuriyet Dönemi Takvimleri," *Cogito* 22 (Spring 2000), p. 126.

[179] "Takvimde Tarih Mebdeinin Tebdili Hakkında Kanun," Kanun Numarası: 698, Kabul Tarihi: 26/12/1925, *Yayımlandığı Resmi Gazete*: 2/1/1926 Sayı: 260, Yayımlandığı Düstur: Tertip: 3, Cilt, 7, p. 159.

The Gregorian calendar was adopted by the Parliament as a revolution. Also, its very name was controversial: *Miladi Takvim*. The term of *Millat* means the birth of the Christ in Turkish. This type of calendar was called the Gregorian calendar in Western countries, and *efrenci* (European), *tarih-i efrenc* (the Gregorian calendar), or *frengi* (European) claendar in Ottoman.[180] Because the Gregorian calendar begins from the *reis-i sene-i nasara* (birth of Jesus), this calendar was understood to be a Christian calendar, which had been unacceptable to the Ottomans by that name. In the Republic, perhaps, it was thought that this name would not be accepted by the Turkish people and so it was dubbed the *Miladi Takvim*. In the end, a new calendar was introduced to Turkey and the Turkish calendar was adapted to the Western calendar system.

The changing of the calendar was described in a caricature in *Cumhuriyet* newspaper on 1 *Kanun-i Sani* 1926 (16 *Cemaziyevvel* 1344) showing a baby, who is the new calendar and a mother, who is old calendar.[181] Also, the new calendar was evaluated in an article titled "*Yeni Seneye Girerken Sal-i Güzeşte'nin Muhasebe-i İmaline Dair Bir Nazar*" (an Evaluation of Looking at Last Year Events When the New Year Begins). In this article, the writer summarized the events of last year (1925) and the new reforms in the Republic. He claimed that the old calendar had no scientific basis and that the calendar had become civilized by the Republic. He described an event that he had experienced ten years earlier, "in a foreign country, a policeman who did not know any Turkish did not understand the date on my passport, which was in the *Hicri* calendar." He evaluated the calendar reformation as an instrument to becoming synchronized with the civilized nation.[182]

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[180] Ferit Devellioğlu. *Osmanlıca-Türkçe Ansiklopedik Lugat* (Ankara: Aydın Kitabevi Yayınları, 1999), p. 206.
[181] For this caricature, look at the Appendix, p. 158.
[182] *Cumhuriyet Gazetesi*, 16 Cemaziyevvel 1344; 1 Kanun-i Sani 1926, p. 1.

Another article in *Cumhuriyet* was published one day later on 2 *Kanun-i Sani* 1926, under the title "*Geçen Seneden Bu Seneye Geçtiğimiz Gece Beynel-Minel Takvimin Bizde de Kabulü, Yılbaşı Gecesinin Hararetle Tağirine Sebeb Olmuştur*" (The Acceptance of the International Calendar by Us at Last Night that Connects the Last Year and This Year Caused a Good Celebration of New Year's Day). In this article, the writer describes the celebrations of New Year's Day. He writes that the celebration in Beyoğlu was very crowded and long scale entertainment had been organized at the hotels, night clubs, and bars.[183]

Allen evaluates the calendar reform, saying that "it is even difficult to reckon historical dates now, for on 1 January 1926, the old Hegira calendar was definitely abandoned after several years of a clumsy combination of lunar and solar calendars."[184] Berkes says that with the reformation, the confusion was eliminated, and considers it a revolutionist improvement. In addition to this, he says that the calendar gave order to life; it no longer contained any religious meaning. He also claims that the calendar reforms contributed to the abolition of dualism in other arenas.[185]

The calendar in the nineteenth century had been part of the national identity, producing an imaginative linkage in the nation. Anderson says that "imagined linkage derives from two obliquely related sources. The first is calenderical coincidence. The date at the top of the newspaper, the single most important emblem on it, provides the essential connection –the steady onward clocking of homogeneous, empty time."[186] Calendars can produce a nationalist consciousness in a community living on the same schedule religious or nationalist observances. The newspaper was used by the new

[183] *Cumhuriyet Gazetesi*, 17 Cemaziyevvel 1344; 2 Kanun-i Sani 1926, p. 3.
[184] Henry Elisha Allen. *The Turkish Tarsnformation* (The United States of America: Greenwood Press Publishers, 1968), p. 141.
[185] Niyazi Berkes. *Türkiye'de Çağdaşlaşma*, p. 548.
[186] Benedict Anderson. *Imagined Communities*, (London: Verso, 1991), p. 33.

Republic to spread its ideology to the people; however, the calendar was not considered a nationalistic tool. The calendar was considered as means by which to gain synchronization with the world, especially the civilized nations. The calendar reform in the new Republic was represented as a part of the progression; however, the calendar name was changed. It is interesting that the new name was originally a Turkish name. The Gregorian calendar had been called "*efrenci*" in the Ottoman Empire and the early Republican period. For example, when *Cumhuriyet* announced the calendar reform, the writer says that "we have accepted the *tarihi efrenci*."[187]

The first attempt to compose a nationalist calendar was the French Republican calendar. Zerubavel says that "the revolutionary calendar was clearly meant to be a French calendar. As a symbolic system, therefore, it was supposed to be symbolically associated with nationalism."[188] The second attempt was the Soviet experience, the five-day and six-day weeks were put into practice as a new calendar by the Stalin. In the Republican experience, there was no nationalistic debate about the calendar. The reform was viewed as a synchronization problem only.

The Gregorian Calendar Adoption Period in Various Countries

The Gregorian calendar[189] was prepared by the Pope Gregory in the second part of the sixteenth century. The acceptance throughout Europe took more than three hundred years. Because of the division of the Eastern and Western Christian churches and of Protestants and Roman Catholics, the obvious advantages of the Gregorian calendar were not accepted everywhere, and in some places adoption was extremely slow. In France, Italy, Luxembourg, Portugal, and Spain, the new style calendar was

[187] *Cumhuriyet Gazetesi*, 16 Cemaziyevvel 1344;1 Kanun-i Sani 1926, p. 3.
[188] Zerubavel, *Hidden Rhythms*, p. 94.
[189] For more information, look at appendix, p. 150.

adopted in 1582 and by most of the German Roman Catholic states as well as by Belgium, Denmark, and part of the Netherlands by 1584. Switzerland's change was gradual, beginning in some Catholic cantons in 1583 and being completed only in 1812.[190] The Catholic parts of the Netherlands accepted the new style in 1583.[191] In 1586, Poland adopted the Gregorian calendar.[192] Hungary adopted the new style in 1587, and then there was a pause of more than a century before the first Protestant countries moved over from the old style calendar. Strasbourg and Alsace began to use the new style after they were taken over by France.[193] In 1699-1700, Denmark and the Dutch and German Protestant states embraced the new style, although the Germans declined to adopt the rules laid down for determining Easter, preferring to rely on astronomical tables and specifying the use of the *Tabulae Rudolphinae (*Rudol-phine Tables*)*, based on the sixteenth century observations of Tycho Brahe. They took on the Gregorian calendar rules for Easter only in 1776.[194]

Britain and its colonies, like North America, adopted the new style in 1752. In Britain and the British dominions, the change was made when the difference between the new and old style calendars amounted to eleven days, by naming the day after 2 September, 1752 14 September, 1752. But there was much public misunderstanding, and in Britain, rioters demanded the return of their eleven days even though legislation authorizing the change had been framed to avoid injustice and financial hardship. It was accepted in Ireland in 1782. Alaska retained the old style calendar until 1867, when it became part of the United States. Sweden adopted it in 1753, although, because the Swedes had in 1740 followed the German Protestants in using their astronomical methods for determining Easter, they declined to adopt the

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[190] *The New Encyclopedia Britannica*, p. 602.
[191] Faik Reşit Unat. *Hicri Tarihleri Miladi Tarihe Çevirme Klavuzu*, p. 161.
[192] Ibid., p.161.
[193] Unat, p. 161.
[194] *The New Encyclopedia Britannica*, p. 602.

Gregorian calendar rules until 1844. Japan adopted the new style in 1873; Egypt in 1875; and between 1912 and 1917, it was accepted by Albania, Bulgaria, Estonia, Latvia, Lithuania, Romania, and Yugoslavia. China used the new style only in international relations in 1912. The Ottoman Empire adopted its calendar to the new style; however, the number of the years was maintained in the *Rumi* system. Soviet Russia adopted the new style in 1918; Greece and Rumania in 1924. Jordan began to use the Gregorian calendar with the *Hicri* calendar in 1924.[195]

The standardization of the calendar can be described as a universalism. Parsons writes that "the story of the standardization of temporal reference, which is highly representative of the typically modern trend of shifting from particularism toward universalism."[196] The period of acceptance of the Gregorian calendar is cornerstones of the modern international temporal reference framework.

The Gregorian calendar was perceived as a Catholic institution. Therefore, non-Catholic Christian countries were reluctant to this calendar as mentioned above. In the seventeenth century, the non-Catholic world began to accept the Gregorian calendar. In the nineteenth century, the Gregorian calendar could no longer regarded as a Catholic calendar or a Christian calendar among non-Christian worlds. It was accepted as a universal calendar throughout the world at the beginning of the twentieth century.

When we look at the beginning of the twentieth century, most countries had accepted the Gregorian calendar. At this point, Zerubavel writes that, "by the time of World War I, adopting the Gregorian calendar seemed to have become almost an obligatory ritual that had to accompany every revolution or proclamation of

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[195] Unat, p. 161.
[196] Talcott Parsons, *The Social System* (New York: Free Pres, 1951) is quoted from Zerubavel, *Hidden Rhythms*, p. 98.

independence."[197] China adopted the Gregorian calendar after the outbreak of the Chinese revolution (1912), and Lenin introduced it to the Soviet Union "for the purpose of being in harmony with all the civilized countries of the world" less then three months after the Bolshevik revolution.[198]

The calendar reform meant westernization in the Japanese experience, independence in the Balkan countries, civilized tool that supply the synchronicity with the world in the Soviet Russia. The Turkish Republican experience resembles the Soviet experience most in its acceptance style and mentality.

The *Miladi* Calendar

The *Miladi* calendar is based on the solar circle. It has 365¼ days and twelve months, like other Gregorian calendars. New Year's Day is the first of January. In 1926, the month names were *Kanuni Sani* (January), *Şubat* (February), *Mart* (March), *Nisan* (April), *Mayıs* (May), *Haziran* (June), *Temmuz* (July), *Ağustos* (August), *Eylül* (September), *Teşrin-i Evvel* (October), *Teşrin-i Sani* (November), and *Kanun-i Evvel* (December).

The month names come from Turkish, Suryanice (Syriac), Akkadian, Sumerian, Hebrew, and Latin. The roots of the month names are explained by Avram Galanti in *Küçük Türk Tetebbular* in (*Hicri* 1341, 1925). He writes that *Kanun-i Sani* comes from Syriac, which came from *Konoun* in Sumerian, and its meaning, "stove," *Sani* means "later" in Ottoman. *Şubat* comes from *Şebat* in Syriac, which came from *Schabatu* in Akkadian, meaning "a kind of wheat." *Mart* comes from Latin and it means "the god of war." *Nisan* comes from Syriac, which came from *Nissanou* in

[197] Zerubavel, *Hidden Rhythms*, p. 99.
[198] Ibid., p. 99.

Akkadian, the meaning is not definite; also it is the first month of Hebrew calendar. *Mayıs* comes from Latin, meaning *Maia*; that is, "the god of the italic." *Haziran* comes from Syriac, which came from *Heziron* in Akkadian, and its meaning is also not definite. *Temmuz* comes from Syriac, which came from Akkadian and it came from *Doumuzi-zuab* in Sumerian, meaning "genuine sun of deep water." Some say that it came from *Temmuz* in Hebrew, meaning "a kind of god." *Ağustos* comes from Latin, after the Roman Emperor Augustus. *Eylül* comes from *Iluil* in Syriac, which come from *Uolulu* or *Alalu* meaning "to shout with delight" in Syriac. There are two arguments about *Teşrin-i Evvel*: one is that it came from *Tischritu* in Akkadian, meaning "to begin", and the other is that it came from the Arabic *Teşrin* and means "autumn." Also, *Evvel* means "former" in Ottoman. These arguments are also valid for *Teşrin-i Sani*. *Sani* means "later" in Ottoman. *Kanun-u Evvel* comes from Syriac, which came from *Konoun*, in Sumerian meaning "stove." *Evvel*, again, means "former" in Ottoman.[199]

In 1945, the month names were changed with a law titled *Bazı Ay Adlarının Değiştirilmesi Hakkında Kanun*[200] (the Law for Changing Some Month Names). The new names were *Ocak* (January), *Şubat* (February), *Mart* (March), *Nisan* (April), *Mayıs* (May), *Haziran* (June), *Temmuz* (July), *Ağustos* (August), *Eylül* (September), *Ekim* (October), *Kasım* (November), and Aralık (December).

Ocak comes from Turkish and it means "stove." *Ekim* comes from Turkish, meaning "sowing" or "planting." *Kasım* and *Aralık* also come from Turkish. *Aralık* means "interval."

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[199] Avram Galanti, *Küçük Türk Tetebbular* (İstanbul: İstanbul Kağıtçılık ve Matbaacılık Anonim Şirketi, *Hicri* 1341/1925) vol. 1, pp. 53-62.; Resuhi Baykara, "Takvim Yılları ve Ay Adları," *Tarih Dünyası* 2, no.19 (15 January 1951), pp. 846-8 and 873.

[200] 'Bazı Ay Adlarının Değiştirilmesi Hakkında Kanun', Kanun Numarası: 4696, Kabul Tarihi: 10/01/1945, *Yayımlandığı Resmi Gazete*: 15/01/1945 Sayı: 5905, Yayımlandığı Düstur: Tertip: 3, vol. 26, p. 180.

The *Hicri* Calendar in the Republican Era

As discussed above, a reform was made by the government on the calendar issue in 1926. The *Hicri* calendar was abolished at the official level and its use continued only in religious practice.[201] In 1925, the *Hicri* calendar was prepared by the *Başmuvakkitlik.*

After the acceptance of the law, the duty of preparing the *Hicri* calendar was given to the Kandilli Observatory. In these years, Fatin Gökmen, who was the founder and manager of the observatory, began to calculate the *Hicri* calendar. He had given *Takvim* (calendar) and *Heyet* (astronomy) lessons at the *Darulfünun* (Istanbul University) and had worked at *Sultan Selim Muvakkithanesi.* In the *Kandilli* Observatory, he calculated the *Rüyet-i Hilal* (appearance of the moon) according to the highest hill in Morocco, the westernmost Islamic country in the world.[202]

An international conference on the *Hicri* calendar was organized by the Kandilli *Rasathanesi* and the *Diyanet İşleri Başkanlığı* (Supreme Board of Religious Affairs) in Istanbul under the title *Ru'yet-i Hilal Konferansı* (Conference for the Sighting of the Moon). In 1974, the lecturers, who were scientists on law, religion, and astronomy, came from forty-two Islamic states. In 1978, they established the *Islam Ülkeleri Takvim Komisyonu* (the Calendar Commission of Islamic States) from 27 to 30 November, 1978. Afterwards, they published a decision about the international *Hicri* calendar, stating that their decisions on the visibility of the moon should be

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[201] The third paragraph of the 'Takvimde Tarih Mebdeinin Tebdili Hakkında Kanun', Kanun Numarası: 698, Kabul Tarihi: 26/12/1925, *Yayımlandığı Resmi Gazete*: 2/1/1926 Sayı: 260, Yayımlandığı Düstur: Tertip: 3, Cilt, 7, p. 159.
[202] Üçer, p. 126.

made not only by calculation, but also by the visual sighting.[203] Today, this calculation is still made by the Kandilli Observatory and Earthquake Research Institute at Boğaziçi University. The time department in the astronomy laboratory at the Observatory calculates the *Hicri* calendar and the data is announced to other Islamic states through the agency of the *Dış İşleri Bakanlığı* (Ministry of Foreign Affairs) and the *Diyanet İşleri Başkanlığı*.

The Fiscal Year in the Republican Era

With the calendar reformation, the fiscal year was separated from the *Miladi* calendar year. In the early Republican period, the beginning of the financial year became accepted as June with Law No. 715 on 21 *Kanun-i Sani* (January) 1926. The fifth paragraph of the *Muhasebe-i Umumiye Kanunu* (the Law of General Accounting) stipulated that "the beginning of the financial year is *Haziran* (June)."[204]

Eighteen years later, because of the inability to complete construction bid awards in the season that was suitable for construction, the financial year was united with the *Miladi* year and began from *Ocak* (January) with Law No. 4698 on 1 June, 1945.[205]

According to the *Teşkilat-ı Esasiye Kanunu* (Law of Foundation of Organization), the government budgets had to be resent to the parliament at the beginning of November. In spite of the fact that the budget had been presented at the beginning of the *Ekim* (October), in this period the parliament closed. Therefore, it was accepted that the financial year began from *Mart* (March) in 1949 with Law No. 5419 because there was no time to discuss the budget in the parliament. Thus, in this

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[203] Ibid., p. 126-127.
[204] *Türkiye Ansiklopedisi*, "Mali Sene," Vol.4, p. 67.
[205] Ibid., p. 67.

period, the financial year started from *Mart* (March) and was finished in *Şubat* (February) at the official level.[206]

In 1983, the financial year was combined with the *Miladi* year and was started from *Ocak* (January).[207] The fiscal year was used at the finance sector for sixteen years. After 1983, no special fiscal year remained in the Republic.

In other countries, the financial year does not start with the Gregorian calendar, except for in France and Belgium; it starts from April, June, or July. For instance, in Germany and Britain, it starts in April, and the United States of America and Italy from July.[208]

This financial year was not the same as the Ottoman financial year. The application of the Ottoman financial year can be divided into two main steps. In the first period, before the 1860s, the Ottoman treasury used this calendar only for its own calculation. In the second period, after the 1860s, the financial year was put into practice as a new type of year based on the solar circle for months and lunar circle for years. Called the *Rumi* calendar, this system had months and year numbers. However, the financial year in the Republican era used it only for calculations for the government after the establishment of the Republic, as in the earlier period in the Ottoman financial year.

The Week and Weekend Holidays

The week is an artificial unit in that it is not based on any astronomical events. Once the day is divided into parts, the next task is to gather numbers of days into groups. Among ancient societies, it was common to count moons (months) rather than

[206] Ibid., p. 67.
[207] *Temel Britannica Temel Eğitim ve Kültür Ansiklopedisi*, "Takvim," vol. 16, p. 313.
[208] *Türkiye Ansiklopedisi*, p. 67.

days, but later a shorter period than the month was thought more convenient, and an interval between market days was adopted. It varied widely. In West Africa, some tribes used a four-day interval; in Central Asia five days was customary; the Assyrians adopted six days and the Egyptians, ten days, whereas the Babylonians attached particular significance to the days of the lunar cycle that were multiples of seven. In ancient Rome, there was a *nundinae*, or nine-day, period between weekly markets, although because of the Roman method of inclusive numeration a *nundinae* contained what would now be called eight days.

In the *Hicri* calendar, the months were divided into three parts; the *evail*, meaning "first days of the month" or "beginnings" (1-10); the *evasıt*, meaning "middle times," or "middle days of the month" (11-20); and the *evahir*, meaning "last days of the month" (21-30). In the *Rumi* calendar, the days were numbered according to a seven day system; however, there was the week conception in this calendar system.

As said above, the week is an artificial unit; however, it supplies the schedule basis in the social organization in modern life. Zerubavel writes that "the standardization of the rate of recurrence of periodic events and activities in monastic life was also largely conventional. The artificial basis of the weekly cycle is quite obvious, since there is absolutely nothing in nature that would suggest the inevitability of seven-day rhythmicity."[209] He claims that the modern schedule comes from the monastery life style and this schedules type was secularized; it introduced a new life cycle based on the monastery schedule; however, it contains modern working and living styles.

[209] Zerubavel, *Hidden Rhythms*, p. 41.

The standardization of temporal location presupposes scheduling, a typical western phenomenon which involves moving away "from the natural or casual sense of time toward a sense of time as schedule." [210]

In the *Rumi* calendar, there was a weekly routine; it can be seen in the day systems that divided it into seven days. The weekly routine also could be seen in the religious life and working life. For example, Muslims went to the *Cuma* prayer each week. Although, the *Hicri* month divides the three main sections, *Cuma* comes every seven days. For this reason, the Muslims in the Ottoman put their life in order according to a weekly routine. After the Republican era, the weekly routine was put into practice officially. The modern working life and synchronization of the world necessitated the official weekly routine in the Republic.

In Judaism, there is a holiday conception. According to the Jews, God created the world in six days and he rested on the seventh day, which was Saturday. Therefore, they do not work on the seventh day, and go to the synagogue. In Christianity, the holiday is Sunday. In Islam, the Muslims go to the mosque on *Cuma* (Friday).[211] *Cuma* comes from *cem* in Arabic means "to be gathered."[212] Muslims go to the mosque on *Cuma* and then return to work; that is, *Cuma* is only a prayer that can be performed all together, it is not a holiday.

In the Ottoman era, especially in the early period, there was no holiday concept. After the *Tanzimat* period, modern government institutions became widespread and the number of officials multiplied. In the early period, the government officials went on holiday only on *Cuma*. At the beginning of the nineteenth century, when the number of school and modern institutions increased, the holiday was begun from

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[210] Murray Wax. "Ancient Judaism and the Protestant Ethic," *American Journal of Sociology* 65 (March 1960), p. 453.
[211] *Kur'an-ı Kerim*, Cuma Suresi, 62/9 (Ankara: Türkiye Diyanet Vakfı Yayınları, 1997), p. 553.
[212] Devellioğlu, *Osmanlıca-Türkçe Ansiklopedik Lugat*, p. 144.

Thursday afternoon. In the *medrese* (school in the Ottoman, generally attached to a mosque), the holiday was Tuesday. In this day, there were no main classes and the classes that were given on Tuesdays were called *koltuk*, supplementary classes. The aim of the holiday on Tuesday was to supply time for the students to go the library and take care of their personal business, such as doing his laundry. For this reason, people said *Salı sallanır* (Tuesday swings), meaning it is not suitable day for doing any work.[213]

On *Cuma*, the ordinary Muslim people returned to their work after the prayer. The non-Muslims worked through *Cuma*. The non-Muslim schools held lessons on *Cuma*; the Jewish schools closed down on Saturday and the Christian schools on Sunday.[214] Before the Republican era, there were thus three holiday periods in the week according to the people's religions and institutions.

The week was secularized in Europe. Lewis and Weigert claim that the secular shift is further manifested in declining attendance at Sunday church services and the shift of church services to other days of the week. During the historical period, which included the secularization of Sunday, the labor movement won a shorter work week. These two developments help divide the week into two distinct periods: work days and weekends."[215]

In 1924, the parliament accepted a new law about the holiday in the Republic titled the *Hafta Tatili Hakkında Kanun*[216] (Law for Weekly Holiday). *Cuma* was a holiday to all citizens, Muslim or not; however, the new holiday was not suitable for interactions with Western countries and it caused some problems in trade, banking,

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[213] Osman Nuri Ergin. *Türkiye Maarif Tarihi*, vol. 1 (İstanbul: Osmanbey Matbaası, 1939), p. 182.
[214] Ibid., p. 183.
[215] J. David Lewis and Anrew J. Weigert. "The Structures and Meanings of Social Time," *Social Forces* 60, no. 2 Special Issue (December 1981), p. 440.
[216] Hafta Tatili Hakkında Kanun, Kanun Numarası: 394, Kabul Tarihi: 2/1/1924, *Yayımlandığı Resmi Gazete*: 21/1/1924 Sayı: 54, Yayımlandığı Düstur: Tertip: 3, Cilt, 5, p. 226.

and custom bureaus. Therefore, the holiday was begun from Saturday afternoon with the law of the *Ulusal Bayram ve Genel Tatiller Hakkında Kanun*[217] (The Law for National Holiday and General Holiday) in 1935. With this law, the holiday was brought from *Cuma* to *Pazar*, and its period became thirty-six hours. Moreover, all shops had to close for the duration of the holiday. If a shop opened during the holiday it was fined from five liras to one hundred liras by the government institutions. In addition to this, in 1935, New Year's Day was declared a holiday in the Republic by this law.

Webster describes the holiday reform in his book *The Turkey of Atatürk*, "Sunday was made the official weekly holiday (27 May, 1935) by the enactment of a law which also provided for the suspension of business and industrial operations at thirteen o'clock on Saturdays -to give thirty five hour *vikend*. It also listed all the official annual holidays. The pious continue to observe Friday as the special day of prayer, and the sermon of the week is delivered at the Friday noon service. While many if not all of the other events in the Reformation conducted by the *Kemalists* have social -or sociological- significance, our attention now is directed to those most definitely belonging in this category."[218]

The first weekend was *Cuma* in the early Republican era. This was not suitable for the calendar reform, because the reformists claimed that the new calendar provided synchronicity throughout the world. The weekend was removed from *Cuma* to *Pazar* in 1935. The Republic had maintained the *Cuma* holiday for ten years.

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[217] Ulusal Bayram ve Genel Tatiller Hakkında Kanun, Kanun Numarası: 2739, Kabul Tarihi: 1/6/1935, *TBMM Zabıt Ceridesi*, V. Devre, F inci ictima, Cilt, 3, pp. 302-304., Düstur: Tertip: 3, Cilt, 16, p. 550.

[218] Donald Everett Webster, *The Turkey of Atatürk* (Menasha, Wisconsin: The Collogiste Pres and George Banta Publishing Company, 1939), p. 129.

CHAPTER IV

HOUR MEASUREMENT SYSTEMS

In ancient Egypt, the days were divided into twelve hours, not only the long winter nights but also the short summer nights. This was called *saat-i zamaniye* or *saat-i muavvece* (temporary hours). For instance, at the Istanbul latitude, the longest day on June 22, is fifteen hours and twenty-two minutes; if this period is divided into twelve equal parts, the period of temporary hours is one hour and seventeen minutes. On winter solstice in December 22, the shortest day is nine hours and twenty-seven minutes; the period of temporary hours is only 47.25 minutes.[219]

In ancient Mesopotamia, days were divided into twelve equal hours. The ancient Greeks learnt this application from the Mesopotamians.[220] In the Hellenistic period, the day was divided into twenty-four hours. This was called, in the old terms, *saat-i musteviye* or *saat-i mu'tedile* (equal hours).[221]

Hour measurement systems can be divided into three main types: First, *akşam başlangıçlı* (beginning from evening), *öğle bağlantılı* (connected to noon); second a real sun hour and mean sun hour; and third local hour and country hour.

There are two types of measuring the hour in day according to its beginning. The first one is, in the Ottoman term, *gurubi* or *alaturka* or *ezani* or; in the Turkish term, *akşam başlangıçlı* (beginning from evening). The second one is, in the Ottoman term, *zevali* or, in the Turkish term, *öğle bağlantılı* (connected to noon).

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[219] Necati Akgür. "Türk-İslam Bilim Tarihi, Saatler," *Türk Dünyası Araştırmaları* 89 (April 1994), p. 158.

[220] Aydın Sayılı. *Mısırlılarda ve Mezopotamyalılarda Matematik, Astronomi ve Tıp* (Ankara: Türk Tarih Kurumu Basımevi, 1982), pp. 88-99. ; Muammer Dizer. "İslam'da ve Osmanlılarda Saat," *Bilim Tarihi* 3 (January 1992) pp. 3-5.

[221] Akgür, p. 159.

The *Gurubi*, *Ezani*, *Alaturka* or *Akşam Başlangıçlı* (Beginning from Evening) Hours

In the *Hicri* calendar, the day begins at evening. If we set our clock to twelve (that is, 0:00) after the sun has set, it begins to work in *gurubi*, *alaturka*, or *ezani* hours; in the Turkish term *akşam başlangıçlı* (beginning from evening). In other words, the main principle of the *gurubi* hours is to show twelve when the sun set.[222]

In this system, days begin from the evening; that is, the night that begins from the sunset is connected to the next daytime. For example, if we set our clock to twelve on *Perşembe* (Thursday), the night that begins after the sunset is called *Cuma gecesi* (Friday night). In the Koran, the concept of day is given as *leyl* and *nehar* (night and daytime).[223]

The difference of time between any two nights is not completely twenty-four hours. The hours extend in winter and become shorter in summer. However, evening time should be twelve in *gurubi* hours every time. In this situation, the clock must be set to twelve every day, or one time in four or five days as in the Ottoman practice.

The most important negative characteristic of *gurubi* hours was necessity of setting the clock every day and the changing of the day period throughout the year.

Ahmet Muhtar Paşa said in his book *Riyaz ul-Muhtar* that "*gurubi* hours were never reliable as the clocks had to be set according to the sun every day. During Ramadan, to know the time accurately is important. However, in cloudy weather, every *muvakkit* who measured time in Muslim societies did it differently; no one ever said that his calculation was the true. Moreover, the clocks used by Muslims who set them according to the sun had to be adjusted by clock repairmen in order to be

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[222] Akgür, p. 160.
[223] *Kur'an-ı Kerim*, Bakara Suresi, 2/164.

accurate."[224] This hour system was not accurate. For this reason, in Ottoman books especially written before 1910, hours are not given as 10:05, but as *sabah on suları* (about 10 o'clock in the morning).

On this subject, Akgür says that *gurubi* hours showed how many hours to night, which was important in the old period, when lighting was a problem.[225]

Gurubi hours are also called *ezani* hours; because the times of the *namaz* (prayers) are measured according to the sun position. In Muslim societies, life is divided into five parts according to prayer times.

The *Zevali*, *Alafranga* or *Öğle Bağlantılı* (Noon Connected) Hours

When the sun reached the longitude of Istanbul, this time was called, in Ottoman, *zeval* or, in Turkish, *öğle* (noon) for Istanbul. At this time, if the clock is set to twelve, it begins to work as a *zeval* hour or *öğle baglantılı* hour or connected to the noon hour.[226]

In this system, the day begins at noon. However, this application was also problematic. For this reason, the day was begun at midnight, at 00:00. In Turkey, as in most countries, the day starts according to this system.

Measuring hour systems can be studied in two categories according to the position of the sun. The first one is the real sun hour and second one is the mean sun hour. Gnomons are a naturally accruing nature clock. These are made to show twelve in the middle of the day or at midnight. For this reason, time that is shown by gnomon is called real hours. Gnomons and other types of sun clocks do not show the same time as mechanical clock time. For example, when gnomons show noon, mechanical

[224] Ahmet Muhtar Paşa, *Riyaz ul-Muhtar*, pp. 128-129.
[225] Akgür, p. 160.
[226] Akgür, p. 161.

clocks show anywhere between 11:50 or 12:15. This difference is caused by the twenty-three degree twenty-seven minute angle between the sun's orbit plane and the equator plane. Because of this phenomenon, the theoretical sun is accepted along with the real sun. The hours which are measured according to the theoretical sun are called, in Ottoman, *vasati*, in Turkish, *ortalama*, and in English *mean* time. *Namaz* times in this system are set according to mean time.[227] The difference between the real sun hour and the mean sun hour is called, in Ottoman, *ta'dil'i zaman*, in Turkish *zaman düzeltisi*, and in English "equation of time."

In summery, gnomons and other sun clocks show the real sun hour (beginning from evening-real and noon-connected-real). They do not show the theoretical sun hour. However, mechanical clocks show the mean sun hour (noon connected-average hour). It is true that mechanical clocks can be made to work as *gurubi* (beginning from evening) on the theoretical level. Nevertheless, in practice in Muslim countries, they are used as beginning from the evening-real hour due to religious beliefs about this issue.[228]

On third level, hour measurement systems can be studied in two parts according to inhabitation regions: local hours and country hours.

The Local Hours

When the sun reaches the longitude of a city or town, it is the time of noon. In this time system, the gnomon shows twelve in this city (if *gurubi* hours are used, this application is made in the evening). This time is the local hour for this region. This measurement shifts across regions. For instance, in Turkey, when the gnomon shows

[227] Akgür, p. 164.
[228] Akgür, p. 169.

12:00 in Istanbul, it shows 12:04 in Izmit, and shows 12:43 in Trabzon. Moreover, the measurement instrument changes the time data. For example, when the mechanical clock shows 12:00 in Istanbul, it shows 12:04 in Izmit, and 12:43:49 in Trabzon. As a consequence, there are two types of hour conception. The first one is local gnomon sun hour and the second is local mechanical sun hour. In these times, the TV clock shows the same data, as can be seen below.[229]

Table 1: Hour Table According to Cities

	Istanbul	Izmit	Trabzon
Gnomon (real-local)	11:17	11:21	12:00
Local hour (average-local)	11:21:43	11:25:39	11:25
TV (average-country)	11:25	11:25	11:25
Gnomon (real-local)	11:56	12:00	12:39
Local hour (average-local)	12:00:04	12:00	12:43:39
TV (average-country)	12:04	12:04	12:204
Gnomon (real-local)	12:00	12:04	12:43
Local hour (average-local)	12:04	12:08:04	12:47:43
TV (average-country)	12:08	12:08	12:08

In the nineteenth century, in Ottoman and other Islamic countries, the real-local hour started from evening. Indeed, there was an average-local-beginning from evening hour; however, this type of hour system was not used in Islamic countries. In

[229] Akgür, p. 171.

America and European countries, in last century, the noon-connected-average-local hour system was used.

The local hour can be used only its own region. There is no uniformity in the same country. Nevertheless, in the nineteenth century, after the introduction of the train, this caused different hour usage problems. For instance, when a train departed from Istanbul at 13:00, it would arrive at 22:00 in Ankara; however, according to the local hour in Ankara, was not 22:00, but 22:16, which caused integration problems in the train journey. These integration problems began from the centralization of local and peripheral areas after the industrial revolution.

As the local hour system was used around the globe, each country accepted only its own longitude. The French accepted Paris as a beginning of the longitudes, while the Germans accepted Berlin. This application can be seen in *Kamus-u A'lam*, which was written by Şemseddin Sami, that Paris, which was situated at an imaginary longitude, was accepted as the beginning of longitudes for the world.[230]

In the 1840s, a Greenwich standard time for all of England, Scotland, and Wales was established, replacing several local time systems. The Royal Greenwich Observatory was the focal point for this development because it played such a key role in marine navigation which relied on accurate timekeeping. Greenwich Mean Time (GMT) subsequently evolved as the official time reference for the world and served that purpose until 1972.[231]

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[230] Şemseddin Sami. *Kamus-u A'lam* quoted by Akgür, p. 175.

[231] http://www.timekeepers.org; The United States established the U.S. Naval Observatory (USNO) in 1830 to cooperate with the Royal Greenwich Observatory and other world observatories in determining time based on astronomical observations. The early timekeeping of these observatories was still driven by navigation. Timekeeping had to reflect changes in the earth's rotation rate or navigators would make errors. Thus, the USNO was charged with providing time linked to "earth" time, and other services, including almanacs, necessary for sea and air navigation.

The World's Time Zones

Global time zones did not become necessary in the world until trains made it possible to travel hundreds of miles in a day. Until the 1860s most cities relied on their own local "sun" times, but this time changed by approximately one minute for every 12 1/2 miles traveled east or west. The problem of keeping track of over 300 local times was overcome by establishing railroad time zones. Until 1883 most railway companies relied on some one hundred different, but consistent, time zones. [232]

The world's time zones are made up of twelve units, called *memleket saat dilimleri*, or country hour pieces. In Anatolia, the clocks were set according to the East European hour piece.

GMT was accepted in the Republic of Turkey on 26 December 1925, *Hicri* 1341, by Law No. 647 in parliament. [233] The first paragraph states "the day is started from midnight and the hour is counted from zero to twenty-four inside Republic of

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[232] http://www.timekeepers.org; For instance, that year, the United States was divided into four time zones roughly centered on the 75th, 90th, 105th, and 120th meridians. At noon, on November 18, 1883, telegraph lines transmitted GMT time to major cities where authorities adjusted their clocks to their zone's proper time.
On November 1, 1884, the International Meridian Conference in Washington, DC, applied the same procedure to zones all around the world. The 24 standard meridians, every 15° east and west of 0° at Greenwich, England, were designated the centers of the zones. The international dateline was drawn to generally follow the 180° meridian in the Pacific Ocean. Because some countries, islands and states did not want to be divided into several zones, the zones' boundaries tend to wander considerably from straight north-south lines.

[233] Günün Yirmi Dört Saate Taksimine Dair Kanun, Kanun Numarası: 697, Kabul Tarihi:26/12/1925, *Yayımlandığı Resmi Gazete*: Tarih : 2/1/1926 Sayı: 260, Yayımlandığı Düstur : Tertip: 3 Cilt: 7 Sayfa: 158;
Madde 1- Türkiye Cumhuriyeti dahilinde gün, gece yarısından başlar ve saatler sıfırdan yirmi dörde kadar sayılır.
Madde 2- İzmit civarından geçen, 'Griniç'e nazaran otuzuncu derecede bulunan nısfınnehar (boylam) dairesi bütün Türkiye Cumhuriyeti saatleri için esastır.
Madde 3- İşbu kanun neşri tarihinden muteberdir.
Madde 4- İşbu kanunun ahkamına icraya İcra Vekilleri Heyeti memurdur.

Turkey." The second paragraph states that, "it is base longitude that is thirty degree due to Greenwich and passes through Izmit for all clocks in the Republic of Turkey."

Country Hours

Country hours can be used in the same region; although some countries have two or more hour "pieces," like the USA and Russia. In Turkey, the main longitude was accepted as that of Izmit and clocks are set accordingly. This hour system is true only in the cities which are located along 30th longitude, like Izmit, Birecik, and Kütahya.

Standardization of Time

Clock time as we know it today, however, did not come into being until 1780, when Geneva first started to use "mean time" in preference to solar time.[234] In those days, clock time was a direct reflection of solar time.

As late as the mid-nineteenth century, the only valid standard of time was local time. Each city, town, or village had its own time, which applied to it alone. Thus, there was a plurality of local times which were not coordinated with one another, since no locality was concerned with the local times of other localities.

Local times were regarded as problematic until the 1840s, since beginning of the contact among communities. After the invention of the telegraph and telephone communication became instantaneous. Furthermore, minor time differences among communities were not that significant anyway, since, even when people did travel,

[234] Derek Howse. *Greenwich Time* (Oxford: Oxford University Press, 1980), p. 82.

they were usually not concerned with odd minutes. Travel in those days did not yet involve any regular services which might require precise timekeeping. This was also prior to the industrial revolution, and punctuality was not yet as culturally valued as it has been since then.[235]

Punctuality became very important after the introduction of railway transportation. Mukerjee writes that it was railway transportation that, together with the rise of the factory, was primarily responsible for spreading the significance of punctuality and precise timekeeping among the general population.[236]

In the Ottoman Empire, the telegraph and the railways changed the time reckoning after 1850s. The local temporality lost its importance and new time systems began to spread, especially in trade relationships. Trade was one of the most important modernization factors in ordinary people's live. Trade developed its own rules; these rules destroyed the rural working life in the Empire. Besides these, the religious life maintained its own times in all parts of the Empire.

In the second half of the nineteenth century, the new time conception began to spread especially port cities and trade centers that were synchronized with the European stock market. Trade and transportation were maintained according to their own principles as in all industrialized countries. In the industrialized countries, the life was put in order according to new standards, such as scheduling, which became widespread. However, in the Ottoman Empire, the new time system caused a duality in the society.

In Istanbul, for example, there were two hour systems in the same society; one of them was *ezani* (*alaturka*), in Fatih, and the other one was *alafranga* in Pera.

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[235] E. P. Thompson, "Time, Work Discipline, and Industrial Capitalism," pp. 56-97.
[236] Radhakamal Mukerjee. "Time, Technics, and Society," *Sociology and Social Research* 27 (1943), p. 259.

Because there were two time systems in the same society, people could maintain their work according to this duality.

Hour Systems in the Ottoman Empire

In the Ottoman period, determining the five *namaz* (prayer) times was important, as in other Islamic regions. Gnomons and portable machines such as water clocks, astrolabes, and *rubu tables* (one fourth of astrolabe, invented by Ottoman *muvakkits*) were used to determine time. In the early period, the Ottomans were aware of methods from other Islamic states and regions. Moreover, in the era of Murat III, an observatory was established under the management of Takiyyuddin at Pera. Takiyyuddin collected some astronomical data and developed a type of mechanical clock. However, this establishment was abolished.[237]

In the second half of the nineteenth century, the modernizing the establishments caused new types of organization. The Ottoman governor tried to centralize the Empire with new technological innovations. The new developments in transportation and telecommunication destroyed the traditional organizations and its working style. After the nineteenth century, communication with the peripheral provinces could be made in three or four days. And these types of organization produced their own working and production styles. The nineteenth century, especially in the second half of this century, the new working style caused the establishment beginning of a time table in working life. The train journey, school programs, or modern hospitals this needed new time table. People who were related with these areas had to organize their time according to new principles. In addition to this, the Levantines and some non-

[237] A. Suhel Ünver. *İstanbul Rasathanesi* (Ankara: Türk Tarih Kurumu Basımevi, 1985), pp. 51-60.

Muslims developed new working styles. Apart from these, the peasants or people, who had worked or lived in traditional areas, maintained their according to *ezani* hour system. They had to reorganized their times according to *alafranga* hour system at beginning of the twentieth century.

Although the mechanical clocks had become widespread, people set their clocks according to *ezani* hours, and Muslim schools and hospitals opened and closed according to this system. In this working style, there was no punctuality between the establishments. People did not need to compose schedules in daily life. They began their lives after the *sabah* (morning) prayer and men ended their working hours before the *akşam* (evening) prayer, and most of the people slept after the *yatsı* (two hours after sun set) prayer. Indeed, this was the all traditional life style in rural areas not only for the Muslim but for all people. The Muslims alone organized the day according to prayer times.

The *Muvakkithane* and *Muvakkits*

In the Ottoman Empire, time was determined by *muvakkits* in *muvakkithane* which were located by *cami* (mosque) and *külliye* (complex of buildings adjacent to a mosque). *Muvakkits* determined the time and were trained in time measurement.

The first *muvakkithane* was established at Fatih Cami in the Fatih Sultan Mehmet period. It was written in the charter of *vakıf* (religious foundation created by an endowed trust fund) that the *muvakkit* was to receive ten *akçe* (a small silver) a day, was to make his residence above the *muvakkithane*, and was to take his meals

from the *imaret* (place which served free food to the poor and to others, such as *medrese* students) in the *külliye*.[238]

The *muvakkits* manufactured their own tools, repaired, and maintained them; set the clocks, determined the *namaz* (prayer) times and reported them to the *muezzins*. The *muvakkits* were experts on *nücum* (astrology) and *felekiyat* (astronomy). At least, these were their official duties at the observatory.

The *muvakkithanes* were places where people observed the sky and astronomical events.[239] Often built in the baroque, rococo, or Empire styles, they were simple, small in size, and had *sebils* (kiosk built to dispense free drinking water). In general, they had one room, which was square or rectangular, with walls built near roads so passers by could see the clocks. Most of them had one floor, but some had two or more floors which could be used as a library or *sıbyan mektebi* (children's school). In the *muvakkithane*, there were marble bases on which to set clocks.[240]

Unlike the *müneccims*, the *muvakkits* did not work at the Palace. They were selected by the *müneccimbaşı* in Istanbul.[241] Most *muvakkithanes* were founded by philanthropists as *vakıfs* and their functions were set out clearly in *vakıf* charters.[242] In the charter of one *vakıf*, there is information about the duties of *the muvakkit*.[243]

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[238] *Süleymaniye Vakfiyesi*, p. 34 , qouted by Kemal Özdemir. *Osmanlı'dan Günümüze Saatler* (İstanbul: TYT Bank, 1993), p. 30.

[239] A. Suheyl Ünver. "Osmanlı Türkleri İlim Tarihinde *Muvakkithane*ler," *Atatürk Konferansları 1971-1972* (Ankara: Türk Tarih Kurumu Yayınları, 1975), p. 228 and p. 234.

[240] Server Dayıoğlu. "Osmanlı Kültüründe *Muvakkithane*ler ve İstanbul," *Annual Supplement of Arkeoloji and Sanat Magazine -Myth to Modernity- Selected Themes* 1 (2002), p. 83.

[241] Salim Aydüz. "Osmanlı Devrinde Müneccimbaşılık", *İstanbulÜniversitesi Edebiyat Fakültesi Dergisi* (1995), p. 186.

[242] İsmail Hakkı Uzunçarşılı. *Kütahya Şehri*, p. 40 quoted by Özdemir; pp. 31-32.

'... Kütahya mütesellimi dergahı ali kapıcıbaşılarından sahibülhayrat velhasenat ve ragibülcenneti vedderecat atufetlu, inayetlu Hlil Kamili Ağa hazretleri ibni Mehmet Ağa meclisi şeri şerefi Ahmedi ve mahfeli dini münifi Muhammedide zikri ati vakfına lieccittescil mütevelli nas ve tayin eylediği medinei mezburede me'zunu bilifta faziletlu esseyyit Abdurrahman Efendi ibni Osman mahzarında ikrari sahihi şeri ve itirafi sarihi meri idüb medinei Kütayha'da seadet camii şerifi kurbinde vaki bir taraftan kahveci bıdık oğlu Alinin kahve dükkanı ve bir taraftan tariki has ve iki taraftan tariki am ile mahdut arsasını merhume Fatma Hatun vakfına senevi iki yüz guruş mukataai kadimeli ve üzerinde olan ebniyemi bahucceti şeriyye şiraen yedimde mülk ve hakkım olan iki bab dükkanımı hedm ve yerlerine malim ile müceddeden bina ve inşa eylediğim etrafı yonmuş taş divar ile muhat ve üzeri

1. A *muvakkit* must know how to determine prayer times.

2. A *muvakkit* must know how to measure the height of the sun and determine prayer times, which change every day, not only on sunny days, but also on cloudy days.

3. He will set the clocks in the *muvakkithane* and repair them if necessary.

4. He will report each day's five prayer times to the *muezzin*, who gives the call to prayer.

5. He will receive payment in return for these services.

The *muvakkits* prepared *imsakiye* (timetable showing when the fast begins for each day of Ramadan) and pocket calendars.[244]

Wages were low. The *muvakkit'* daily wage was ten *akçe* and *muvakkit* took one hundred *guruş* for on his residence.[245] For this reason, many of the men worked second jobs. Some idealists and amateurs considered their work important.[246]

The *muvakkit* of Sultan Selim Cami had a special place in the Ottoman Empire. He was given a home, firewood for winter, fat, and bread.[247] A well-known *muvakkit* of the Ottoman era was Mustafa bin Ali, who wrote the book *Tuhvetü'l Zaman ve Haridetü'l Evan* about geography; *Heyet, rubu, daire*; and *Hacc Menasıkı*, which were presented to Kanuni Sultan Süleyman. At the beginning of the twentieth

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ahşap ve kiremit puşideli bir bap nam kağir *Muvakkithane*mi ve derununa vaz eylediğim biri sade nam ve biri çalar nam ve biri sade çalar ki ceman üç adet saat ile kezalik derununa vaz ve faş eylediğim yün memlu on dört çuha yastık ve üç çuha mak'at ve üç minder ve bir orta keçesi ve bir bakır mangal ve bir Kula seccadesi ve yine atyebi mal ve enfesi menalimden ifraz eylediğim dört bin guruş nakdimi hasbeten lillahilmelikülehar, ilah. 1248 Şaban 3'

[243] Ünver, "Osmanlı Türkleri İlim Tarihinde *Muvakkithane*ler", p. 255.

a- Sanat-ı mikata vakıf olacaktır. Yani ibadete esas olan vakitlerin tayinini doğru yapacaktır.

b- İrtifa alma fennini tam bilecektir. Zira saatlar olsun olmasın, ancak bu vasıta ile değişen matlup vakitleri, dikkatle tayin olunacaktır.

c- Vakıf saati tashih ve icabında tanzim edilecektir.

d- Takribiyle beş vakit namaz vaktini vazifedarlara ve dolayısıyla halka bildirecektir.

e- Bu hizmetine mukabil her ay bir ücret alacaktır.

[244] Özdemir, *Osmanlı'dan Günümüze Saatler*, p. 29.

[245] Aydüz, "Osmanlı Devleti'nde Müneccimbaşılık," p. 189.

[246] Ünver, p. 255.

[247] Ibid., p. 250; Aydüz, "Osmanlı Devleti'nde Müneccimbaşılık," p. 189.

century, the last *müneccimbaşı*, Hüseyin Hilmi Efendi, worked there as *muvakkit*. People interested in astronomy went to the *Muvakkithane* of Sultan Selim, which was transformed into a school. Fatin Gökmen, who was manager of the Kandilli Observatory at the beginning of Republican era, and Ahmet Ziya (Akbulutlar), who published *Takvim-i Ziya* about 1930, attended lessons at the *Muvakkithane of Sultan Selim* to learn astrology and astronomy. Moreover, Salih Zeki is reported to have been a regular visitor to these classes.[248]

The *muvakkithane* provided lessons on astronomy, both theoretical and practical. For instance, some academics who were cosmographers and observatory managers said that Hüseyin Efendi taught many things to them.[249]

Instruments that could be found in a *muvakkithane* were *irtifa alma aletleri* (altimeters), clocks which concerned the *vakıf* and had been purchased by philanthropic individuals, calendars which gave data about *iftar* (breaking of the fast) and *imsak* (the beginning of the fast Ramadan), handwritten books and pamphlets on astronomy and calendars, chronometers, astrolabes,[250] *rubu tahtaları*[251] (a mechanically exact device used to determine time according to the sun), *rubu circles*, clocks that worked according to *ezani* (*alaturka*) and *zevali* (*alafranga*) time and chiming clocks, sextants and octants, hourglasses, copper braziers, gnomons, and clock repair tools which in general were of concern to the *muvakkit*, not to the *vakıf*.[252]

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[248] Ibid., p. 250.
[249] Ibid., p. 238.
[250] For more information about the astrolobes see Can Kerametli, "Türk İslam Müzesinde İslam Üstürlabları", *Türk Etnografya Dergisi*, no. XII (1969), pp. 73-82; Wolfgang Meyer, "Namaz Zamanlarının Belirlenmesinde Kullanılan Aletler", *I. International Congress on the History of Turkish-Islamic Science and Technology İTÜ 14-18 September 1981* (İstanbul: İstanbul Teknik Üniversitesi Yayınları, 1981) pp. 127-144.
[251] For more information about the rubu tables look at Meyer, pp. 127-144.
[252] Ünver, p. 255-6.

In the *muvakkithane*, as in mosques, some aphorisms were written by calligraphers, mostly in Ottoman, less often in Arabic and Persian, and hung up on the wall to warn people about their time and their styles of consuming time. They cautioned people to "look at the clock, do not waste leisure time," "always work," "do not forget the power which takes you under control," "life is an hour, you spend it in work," "the clock is not for announcing the hour, it is voice reminding you that you are wasting your life."[253]

Ünver writes that the *muvakkithane* can be seen as a local "*fen yuvası*" (science nest) and that their mystical quality can be seen in the aphorisms.[254] These little buildings that might be seen as unimportant were places where time was measured, clocks repaired and adjusted for accuracy, and supplied the process of *heyet ilmi* (astronomy) and its teaching.[255]

By the end of the seventeenth century, a *muvakkithane* was built near every mosque in Istanbul. Özdemir notes that the increase occurred when mechanical clocks became widespread. It was no longer enough for people to know the prayer times with the voice of *ezan*. They would now go to the *muvakkithane* to set their clock according to *ezani* hour at least once a day. Thus, the *muvakkithane* not only

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[253] Ibid., pp. 230-1. The aphorisms are that 'Bak sa'ate kim dakika fevt eylemeyüp, İşletmede rakkas-ı derununu her gah, Miftah-ı inabetle kur işlet sende, Dil-i sa'at-ini bisavt-i Allah Allah' (Saate bak, boş vakit geçirme! Daima çalış! Sana hakim olan kudreti unutma!) in Sultan Ahmet *Muvakkithanei*; 'Sa'atin mu'cize-i Hazret-i Yusuf idüğün, Zamm-i Ahadile darbında işit leyl-ü nehar, İsm-i Yusuf sad ü pençah ü şeş oldukça şumar, Sa'ate bak nice geçmez o hisab üzre çalar', (Saat Peygamber Yusuf mucizesidir, o hep onun hesabı üzere çalar) in Eyüpsultan *Muvakkithanei*; 'Ruz-i ömrümden geçen her sa'at ü dehrin hasılı adadır. Yok nefes azade hale bin bela munzam, Nabecay-i vaz-ı bu dehrin kadim mu'tadıdır, Şeb-i yeldayi müneccimle muvakkit ne bilir, Mübtelay-i gama sor kim geceler kaç saat' (Ömürden geçen saatler elemlerinde geçtiğini gösterir, üzüntülü geceleri müneccim ve zamanı bildiren bilmez, onu sen gamlılara sor); Yar-i müşfiktir çalar-sa'at beni agah ider, Ömrümün her saati geçtikçe bir gez ah ider' (Saat şefkatli bir dosttur, zira ömrünün geçen saatlerine ah eder); 'Sa'at-i vahidedir ömr-i cihan, Sa'ati ta'ate sarf eyle heman' (Ömür bir saattir, Sen onu çalışmakla geçir); 'Sa'atin çaldı evkat değildir her gah, Müddet-i ömrü geçüp gittiğine eyler ah' (Saatin çaldığı, vakti bildirmek için değildir, onun sesi senin ömrünün boş geçtiğini hatırlatır); 'Sa'atin beyhude sanma nale vü feryadını, Ömr-i insanın gelüp geçtiğini ihtar ider. (Sen onun sesini beyhude sanma, Zira ömrünün gelip geçtiğini ihtar eder)'.

[254] Ibid., p. 231.

[255] Ibid., p. 228.

determined prayer times, but also became a center for people to set their mechanical clocks. The *muvakkithane* opposite Fatih Cami in Trabzon, for example, was called the *saathane* (clock house) by the people.[256]

In Europe, clock towers began to be constructed in the thirteen century. From the thirteen to nineteenth centuries, there were no clock towers in any Islamic state or regions, although a square clock had been erected at the Ümmeyye Cami in Damascus in the ninth century. However, public clocks were not widespread in Islamic regions, perhaps because the *muvakkithane* time services were sufficient until the nineteenth century. An example of this is the "*Yenicami ayariyle*" (adjustment for accuracy according to Yeni Cami) written at the top of the *Şirket-i Hayriye* (*Şehir Hatları Vapur İşletmesi*, business enterprise for city line steamship) ticket.[257] A second example is the *Şark Ekspresi* (east express), which used the data of *Yeni Cami Muvakkithanesi* as its time scale.[258] Furthermore, two clocks, one of which showed the *ezani* (*alaturka*) hour and the other of which showed *zevali* (*alafranga*) survived at the top of the *Muvakkithane of Yeni Cami* until 1950.[259]

The social functions of the *muvakkithane* changed along with the time. Until the eighteenth century, the *muvakkits* determined the time with water clock, gnomon, and the other astronomical methods. They determined the prayer times and prepared the *imsakiye* in *Ramazan*. After the eighteenth century, the mechanical clock began to spread throughout the Empire. The mechanical clock became the main tool in the *muvakkithane*; these clocks were set by the *muvakkits* in every day according to the suns' position and people set their clock according to *muvakkithane* clock. In the *ezani* hour system, people had to set their clock every three days. People had to

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[256] Özdemir, pp. 34-35.
[257] Ünver, pp. 228-229.
[258] *50 Yıllık Yaşantımız 1923-1933*, vol.1 (İstanbul: Milliyet Yayınları, 1975), p. 89.
[259] Ibid., p. 89.

control their clocks with other clocks. At this point, the *muvakkithanes* worked as a synchronization center in society. People went to the *muvakkithane* to set their clock, its' social function began to change after the mechanical clock became prevalent. At the end of the nineteenth and beginning of the twentieth centuries, the *alafranga* hour system was begun to be used in some areas. Most of the *muvakkithanes* had two clocks, one of which showed the *ezani* hours and the other which showed the *alafranga* hours. The *muvakkithanes* were the center of clock setting.

In some *muvakkithanes*, as mentioned above, astronomy, and astrology lessons were given to the ordinary people. The *muvakkits* calculated the prayer times and fast times according to astronomical principles. Moreover, some *muvakkits* repaired the mechanical clock in the *muvakkithane*. The last function of *muvakkithane* shows that craftsmen sometimes worked as *muvakkit*. They maintained two different professions at the same time.

The *muvakkithane* had an important role in the Ottoman Empire. The hours were determined by the *muvakkithane* which was near the mosques. The time was determined by the religious authority in the *muvakkithane*. People set their clocks in front of the mosques, which were the main meeting arena for the people. The *muvakkithanes* supplied not only the time measurement and its announcement to the people but also it gave the scared dimension to the hours.

The *muvakkithanes* were located in Istanbul, Bursa, Gelibolu, Iznik, Kütahya, Manisa, Izmir, Aydın, Tire, Afyon, Balıkesir, Edirne, Çanakkale, Çorum, Kastamonu, Amasya, Trabzon, Erzurum, Salonica, Belgrade, Tırnova, Hanya, Girit, Beirut, Damascus, Baghdad, and Taif. Outside of these cities, the duties of the *muvakkit* were carried out by the local *imam* (prayer leader) of the central *mosque*. At the time of *namaz*, the *ezan* was announced from the central *mosque*. Afterwards, the other

mosques gave the call to prayer. This can be interpreted to mean that time measurement made by the *muvakkithane* in the Ottoman Empire were used while tower clocks were being built in every part of the Europe.

When did the *muvakkithenes* close? This question cannot be answered easily, because they were *vakıf* establishments, many of which were closed in the Republican era. It is know that some *muvakkithanes* were closed about 1950. With the spread of mechanical clocks, the need for this establishment disappeared. However, some of them remain open today as museums or observatories for people interested in astronomy.

Mechanical Clocks in the Ottoman Empire

To understand the development and spread of the clock in the Ottoman Empire, first a look at the invention of mechanical clocks and their spread throughout the world is necessary.[260] People used water clocks to determine the time of sunset or on cloudy days. These clocks were developed and parts were added; thereafter, water clocks in the East were made that chimed at the beginning of each hour. [261] The mechanical clocks were developed according to water clock principles.

Mechanical clock production was difficult before the sixteenth century. In this period, mechanical clocks were used only as tower clocks in the city centers of western cities, or by the aristocracy. In the Ottoman Empire, mechanical clocks were only available in the palace. Some of them came from Europe to the Sultan as gifts.

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[260] For more information, look at appendix, p. 151.

[261] Carlo M Cipolla. *Saat Makinesi ve Toplum 1300-1700* (İstanbul: Kitap Yayınevi, 2002), p. 12-23.; In the Abbasid era, water clocks were developed and sent as gifts to other countries. For instance, Caliph Harun Reşid sent a water clock in 807 AD to France. In this period in Europe, these types of clock were unknown. In ninth century, at the Damascus, there was a water clock which had twelve windows that showed the twelve hours at the Ümeyye Cami, and chimed hourly. In the East, in especially China and India in the same period, water clocks continued to be improved. These technological developments passed to the West.

After the seventeenth century, mechanical clock production became widespread in the Ottoman Empire. However, in Europe at this time, mechanical clocks were being manufactured in factories and exported to other countries, especially to the East.

As mentioned, European ambassadors who traveled to the Ottoman Empire in the sixteenth century gave mechanical clocks and clockmakers as gifts to the Sultan. The clockmakers repaired the clocks in the palace and returned to Europe with the ambassadors.[262] At this point, Qaisar says that "in this race for things exotic, local rulers (pashas) and provincial governors too evinced occasional keenness for possession. Otto Kurz remarks in his admirable monograph that 'while clocks and watches were a common sight in the Turkish capital, the situation was entirely different in the province.' At any rate, even in the capital, these articles were owned by the elite."[263] The clock was evaluated as an ornament or house decoration in the Empire. It was not used only to determining time; it was an instrument to decorate their house.

The interest in mechanical clocks led to the emergence of a clock-making center in Galata. Clocks produced in this district were called *Galatakari saat*. Later, they became known as *Istabulkari*, although most them were still produced in Galata.[264] Clockmakers were Muslim, non-Muslim, and Levantine, working in the palace and outside the palace.

The forerunner of the pocket clock was known as *koyun saati* (bosom clock) because they were kept in the bosom. It was called an *akreb koyun* (hour hand bosom) clock if it showed only the hour and minutes, and an *aylı-günlü* if it had history

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[262] Muammer Dizer, "İslamda ve Osmanlılarda Saat", p. 11.
[263] A. Jan Qaisar, "Response of Turkey and Other Asian Countries to European Clocks and Wathes During 16th and 17th Centuries: A Comparative Study", *I. International Congress on the History of Turkish-Islamic Science and Technology İTÜ 14-18 September 1981*(İstanbul: İstanbul Teknik Üniversitesi Yayınları, 1981), p. 10.
[264] Özdemir, Osmanlı'dan Günümüze Saatler, p. 83.

indications.[265] Ottoman clock makers numbered their clocks.[266] For example, the number fifty meant the clock was the fiftieth produced by a certain clockmakers.

Ottoman clockmakers began to produce original models in the seventeenth century. Figures shaped like a shield were called *kalkan duvar saatleri*. These became the characteristic style of the seventeenth century. They also manufactured *koyun saatleri*, *asma saatler* (hanging clocks), and *çekmece formlu müzikli saatler* (clocks which had music like small ornamented chests).[267] Among the clockmakers in the seventeenth century were Bulugat, Şahiz, Mustafa Aksarayi, and Şeyh Dede.[268]

In this period, clocks continued to be brought by European embassies to the Court but without the clockmakers. This was compensated by the development of a colony of watchmakers from Geneva at Galata. The reasons for this can be classified in three categories; complete watches were imported for the Turkish market, watches were assembled with imported parts, and on rare occasions, these articles were made at Galata itself.[269]

Ülkümen claims that there were one-hundred sixty clockmakers in Istanbul in the seventeenth century. He also says that Isac Rousseau, who was father of Jan Jack Rousseau, was a palace clockmaker.[270]

The acceptance and spread in the Empire of mechanical clocks is interpreted by Qaisar as follows,

> Another factor that might have hastened the process of exposure and the consequent positive response was the geographical proximity of Turkey to, and her direct political relations with, European countries. From sociological point of view, regular contact with an alien culture group over a long period was likely to

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[265] Ibid., p. 117.
[266] Ibid., p. 119.
[267] Ibid., p. 122.
[268] Dizer, "İslamda ve Osmanlılarda Saat", p.11;for more names look at A. Süheyl Ünver, "Türk İnce El Sanatları Üzerine", *Türk Tarih Kurumu Yıllık Konferansları I, Atatürk Konferansları* (Ankara: Türk Tarih Kurumu Basımevi, 1964) pp. 130-134.
[269] Qaisar, p. 11.
[270] Perran Ülkümen, "Saatçiliğimiz", *Türk Etnografya Dergisi* 4 (1962), p. 18.

> be helpful in shedding off xenophobia, if any. Here we should consider one important aspect of the exposure-response syndrome, that is, the degree and nature of 'local receptivity or compatibility.' We may ask: was there any 'utilitarian compulsion' for Turks to respond favorably towards European clocks and watches? Even in Europe as Arnold Pacey has shown, the first weight-driven clocks were made more 'for reasons of the intellect and imagination' than for practical utility: it was case of 'interest in mechanical things for their own sake.'[271]

The mechanical clock was not an instrument to show the time, it was an ornament not only in the Ottoman but also the other countries. People used clocks to manage the social life; and as decorative elements in dressing.

Mechanical clocks caused new relations between the Ottomans and Europeans. Some Ottomans liked these productions and some of them became interested in the European lifestyle through these types of technological tools.

In the eighteenth century, some clockmakers were Saatçi Edirneli İbrahim Zihni, Osman, Abdurrahman, Sayid Mustafa, and Mintelamizi Derviş Yahya. Even in the eighteenth century, the clocks were considered more for ornament, like furniture in rooms, than for use in pockets.

In comparing the demand for clock from the Eastern countries until the eighteenth century, an interesting difference between the Ottomans and Japanese on the one hand, and the Persians, Indians, and Chinese on the other emerges in spite of the fact that all of them used non-western hour systems based on natural circle. The Persians did not like European systems and clocks. In the India, the Indians did not demand clocks and the Europeans did not ever contemplate selling clocks on a wide scale in India; consequently, these were neither imported nor produced in India as in Galata. In the China, no large scale import is known, nor a regular production for sale can be established in China when we compare the Ottoman. The Japanese demanded

[271] Ibid., p. 11.

mechanical clocks and produced them with Europeans in Japan.[272] Qaisar writes that "the foregoing selective enquiry in the context of exposure-response syndrome reveals that, comparatively speaking, Turkey took the lead in positive response to European clocks and watches, followed closely by Japan and China. Persia shows diffusion at an extremely low level, practically bordering on rejection; while India's response was entirely negative. But in the case of Persia and India, negative response did not arise out of any built-in resistance to non-traditional articles of technology, nor was it a result of xenophobia or ingrained conservatism. At any rate, even in Turkey there was no question of widespread diffusion."[273] When we compare the Ottomans and the other Eastern people, we can say that the Ottomans liked technological tools; the religious people had used the clocks to determine the time in their own principles, others had used them to determine the times. Both liked the mechanical clocks in daily life.

During the reign of Selim III, *iskelet saat* (skeleton clocks) began to be produced. Selim III was a *mevlevi* (dervish, who are follows the teachings of Celaleddin Rumi), so *mevlevi* clockmakers produced some *iskelet* clocks as gifts to him. Most of their pieces were made to look like *mevlevi kavuğu* (*mevlevi* quilted cap around which the sash of a turban is wrapped). The *iskelet* clocks maintained their popularity during the period of Mahmud II. Esseyyid El-hac Durri, Ahmed Gülşeyniyü'l-Mevlevi, Ahmet Eflaki Dede and his son Hüseyin Haki were *mevlevi* clockmakers producing in the mid-nineteenth century. [274] Other clockmakers at that

[272] Ibid., pp. 12-15.
[273] Ibid., p. 15.
[274] Özdemir, *Osmanlı'dan Günümüze Saatler*, p. 123.

time were Mehmet Şükrü, Mintelamizi Ahmed Dede, Essayit Süleyman Leziz, and El-hac Seyyid Mustafa Refik.[275]

In 1851, according to palace records, Ahmet Eflaki Dede went to Paris to learn new techniques in clock making. In 1863, an exhibition was arranged under title of *Sergi-yi Umumi-yi Osmani* featuring the works of Dede and other Istanbul clockmakers.[276]

In Anatolia in the nineteenth century, local clockmakers, who were most often *muvakkits*, produced wall clocks for mosques and *muvakkithane* in Izmir, Kastamonu, Manisa, Bursa, Kütahya, Amasya, Çanakkale, Trabzon, and Bandırma. These clocks often no sing as to who made them.[277]

In the Abdülhamid era, Ottoman society interest in mechanical clock increased with the appearance of trains. For example, Naşit Bey, the brother of Namık Kemal, became an authority on clocks. He informed the Zenit factory that its clocks had some extra pieces. The factory replied that it would correct this fault, and sent Naşit Bey a letter of commendation.[278]

One of the most important figures in clock making was Mustafa Şem'i (Pek). He was a well-known clockmaker not only in the Abdülhamid II era, but also in the Republican era. Born in Istanbul about 1870, he gained his reputation from public square clocks, tower clocks, and clocks in front of buildings. In 1910, Abdülhamid II ordered six clocks from him. One was sent to the German Emperor Wilhelm, who sent a title of privilege and a fourth graded medal to Şem'i on 13 May 1911.[279]

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[275] Dizer, "İslamda ve Osmanlılarda Saat," p. 11. For more names see Süheyl Ünver. "Türk İnce El Sanatları Üzerine," pp. 130-4.
[276] Özdemir, *Osmanlı'dan Günümüze Saatler*, p. 127.
[277] Ibid., p. 139.
[278] Nurettin Rüştü Büngül. *Eski Eserler Ansiklopedisi*, vol. 2, Tercüman 1001 Temel Eser, topic of saat quoted by Özdemir, *Osmanlı'dan Günümüze Saatler*, p.131.
[279] Mustafa Şem'i. "Kuleler ve Mebani için Büyük Saatler," it was published by him as a brochure about 1934-1935, quoted by Özdemir, *Osmanlı'dan Günümüze Saatler*, p. 133.

Şem'i manufactured two clocks to be installed the *Harbiye Nezareti* (Ministry of Military), which is Istanbul University today. In 1926, he repaired four clocks in the Edirne clock tower. In 1929, he produced a new clock for *Saray Bahçesi* in Izmir. In 1933, he produced a clock for the *Haydarpaşa Garı* (Haydarpaşa train station). His work also appeared in the *Ankara Ticaret Lisesi* (Ankara Commerce High School), *Balıkesir Erkek Ögretmen Okulu* (Balıkesir Teacher High School for Boys), *Nişantaşı İngiliz Lisesi* (Nişantaşı British High School), and *Robert Koleji* (Robert College). Beyond these, he manufactured public square clocks and wall clocks for factories and institutions.[280]

From the beginning of the eighteenth century, in Izmir, a group of clockmakers manufactured mechanical clocks under the mark of "*SMYRNE.*" In this group composed of non-Muslim Ottomans and Levantines, were names such as Michel Scuto, P. Seferiadis, Serefraz, Astlick, Simon S. Simonien, G.M. Anghelidakis, and A. Papanicoli.[281]

Ottoman clockmakers produced their clocks as works of art. Each clock was produced in a different style and had special features; they were handmade, not produced in factories. Therefore, they did not compete against western clockmakers. [282] Ülkümen claims that "our clocks are not showier than the European clocks. Our clock-making techniques are based on our home and life style. For this reason, our clockmakers produced these clocks that were not copied from European clocks."[283]

European clock factories opened agents in Istanbul to sell their products. On the dial of each clock appeared the agency name and "Constantinople." These clocks

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[280] Ibid., p. 133.
[281] İsmail Öztürk. "Smyrne Yazılı Saatlere Üç Örnek," *İzmir Dergisi* 5-6, pp. 40-42 quoted by Özdemir; *Osmanlı'dan Günümüze Saatler*, p. 138-9.
[282] An interview with Recep Gürgen who was apprentice of Wolfgang Meyer quoted by Özdemir, p. 142.
[283] Ülkümen, p. 19.

were sent from Istanbul to the Balkans, Russia, Iran, Syria, Caucasia, and the Middle East. The most successful representatives and merchants were Cezveciyan, Papazyan, Hayizmeyan, Tolayan, and Keşişyan.[284]

Pierre Le Roy, who was a well-known clockmaker in France, exported a large number of clocks to the Ottoman Empire under brand of "*Le Roy et Fils.*"[285]

Factory manufactured clock imports from western countries negatively affected Ottoman clockmakers, because of their low prices. Özdemir writes that,

> The number of clocks imported from Britain was 78,000. In 1897, clocks were more significant imports than other goods that were imported from foreign countries. The total price of import clocks was 7,000,000 *kuruş*. The total price of medicine that was imported from foreign country was 22,700,000. As for the total price of paper, it was 20,700,000." ... "it is clear that there were not significant a few hundred clocks which produced by hand in Istanbul Bursa, Konya, Kütahya, Bandırma, Kastamonu, Izmir. Clocks produced in the Empire were each unique and produced with artistic value. Each clock had a new style. This work needed more time. Moreover, the tools used in making clocks were expensive.[286]

Today, Ottoman clocks can be seen at in Topkapı Palace, Dolmabahçe Palace, Beylerbeyi Palace, Küçüksu Kasrı, mosques, and *vakıf's* (foundations).

Clock Towers in the Ottoman Empire

In the thirteenth century, the first clock towers were built in Europe. Artistic tower clocks worked according to astronomical data.

The innovation of the clock towers was not only technological, but also a social innovation. This technological development was the prerequisite for the spread of modern hour-reckoning as a new social practice only in a general sense. details on the spread of clock towers is summarized by Rossum from Gustav Bilfinger writes that

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[284] La Turquie-Revue Mensuelle de Salon, de Publicite, year: 1, no. 3 quoted by Özdemir, p. 93.
[285] Wolfgang Meyer. *Topkapı Sarayı Müzesindeki Saatlerin Kataloğu* (İstanbul: 1971), p. 14.
[286] Özdemir, p. 142.

the striking clocks and modern hour reckoning became a necessity for the increasingly complex way of life of the city-dwellers; urban trades and commerce to coordinate their activities. Werner Sombart argues that the acquisition of public clocks by modern princes and progressive city administrations was a sign of the level of mercantile rationality. March Bloch, too, relies on Bilfinger's work when he describes public clocks as financed with founds from the urban bourgeois. Christian Bec has made the merchants into agents of the transformation in consciousness: "The merchants of the fourteenth century, by building the first public clocks, created the regular, laicized hour, the urban hour, the hour of the opening and closing of shops and workshops."[287] Jacques Le Goff develops these and attributes to the merchants a need for more precisely measured time.[288]

All of these writers develop their ideas on development of the clock tower as the center of the mercantile rationality. Rossum, however, claims that "even in regions where such activities are very densely documented they were not the rule. In the vast majority of cases we must assume that the impetus for the acquisition of public clocks came from the communities themselves. The relatively few texts that allow any kind of inference about the nature of communal initiatives confirm what has been variously conjectured: inter-city competition for prestige was a motive of considerable importance behind the drive to get a clock."[289] Competition for prestige meant that a city acquired a public clock because other cities had them.

The proponents of the first thesis claim in general that traders and merchants in the cities had particular interest in public clocks and thus actively promoted them by

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[287] Gerhard Dohrn-Van Rossum, *History of the Hour –Clocks and Modern Temporal Orders-* trans. Thomas Dunlap (Chigago & London: The University of Chicago Press, 1996), pp. 126-7.
[288] Jaques Le Goff, "Labor Time in the 'Crisis' of the Fourteenteh Century: From Medieval Time to Modern Time," *Time, Work, Culture in the Middle Ages* trans. Arthur Goldhammer (Chicago: The University of Chicago Press, 1982), p. 48.
[289] Rossum, p. 140.

bringing about corresponding political decisions or by financing the clocks. They base their thesis on the rationalist ethos of merchants. However, Rossum asserts that,

> While it is true that the group of "innovators" included some of the most important mercantile metropolises in Europe at the time (Milan, Genoa, Florence, Bologna, and Siena), they shared that role with cities that were far less important in mercantile terms, like Orvieto, Zurich, or St. Quentin. Most of all, nowhere did special mercantile interests come into play visible; nowhere can we detect a special financial engagement on the part of the merchants... nowhere do the merchants make their appearance as a separate interest group; nowhere can we detect a special pioneering role of the mercantile cities.[290]

The second thesis does not base on economical or alteration of consciousness; it bases an ornament in the city as a technological innovation.

When was the first clock tower built in the Ottoman Empire? The first clock towers were built in European parts of the country; however, clocks did not become widespread. Most of them were composed by the transformation of minarets or towers.

Kienitz claims that clock towers began to be built in the Ottoman Empire after the reign of Kanuni Sultan Süleyman. He gives as an example the clock tower of Ferhat Paşa Mosque in Banyaluka, built in 1577.[291] However, in the Empire, especially in the eastern cities of the state, there were no clock towers until the eighteenth century. In the nineteenth century, clock towers began to be built throughout the Empire. In Europe, clocks were used in publics' areas and then they were used in houses. In contrast, in the Ottoman Empire, clocks were used in houses first and they were used later in public areas, with westernization.

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[290] Ibid., p. 170-1.

[291] F.K. Kienitz, "Osmanische Uhturme, Ein Stück Kulturgeschichte aus Alten Türkishchen Stadten," *Mittelungen, Deutsch-Turkische Gesllschaft E.V.*, Heft 54 (Bonn 1963), pp. 2-5, qouted by Hakkı Acun, *Anadolu Saat Kuleleri* (Ankara: Atatürk Kültür, Dil ve Tarih Yüksek Kurumu Atatürk Kültür Merkezi Yayını, 1994), p. 5.

The clock towers were built in the European parts of the Ottoman provinces in Albania, Elbasan (1670), Berat (seventeenth century), Kavaje (1817), Peçin or Maçin (1834), and Tiran (1793-94); in Bulgaria, Sistova (1760), and Yanbolu (1819-20); in Romania, Budin (tower is at top of the Fethiye Camii minaret); in Greece, Gümülcine (1884-85), Narda (seventeenth century), Yanya (1827), and Yenice Vardarı (1753-1754); in Yugoslavia, Banyaluka (1577), Foça Mehmet Kukaviç Paşa (1637), Gradaçaç (seventeenth century), Mostar (1664) Nevesinye (1664), Saray-Bosna (at the turn of the eighteenth century), Travnik (second half of the eighteenth century), and Mehmet Kukaviç Paşa (1817-18); in Macedonia, Gostivar (1740-41), Manastır (about 18th century), and Negotine (1810).[292] From these dates, we can say that the clock towers were built in the European part of the Empire from the seventeenth century to nineteenth centuries. Moreover, the number of clock towers increased in the nineteenth century with beginning of the modernization period.

When we look at the clock towers at the Anatolian cities of the same period, we can say that most of them were constructed in the nineteenth century.

In the period of the Mahmud II (1807-1839), three clock towers[293] built in Anatolia that were Istanbul-Deniz Hastanesi (1827), Balıkesir (1827), and Burdur (1830) and five clock towers in European parts of the Empire were built. Istanbul, Balıkesir, Burdur, Yanya, Kavaje, Peçin, Negotine, and Yanbolu did not have the same trade conditions. These public clocks can be evaluated as the beginning of the modern city mentality in the Empire.

In the period of the Abdülmecid (1839-1861), three clock towers[294] were built in Anatolia in Sivas (1840), Istanbul-Tophane (1848-49), and Mersin (it was begun to build in 1853 and completed in 1898). There is not enough information about clock

[292] Acun, pp. 46-52
[293] Ibid., pp. 7-45.
[294] Ibid., pp. 7-45.

towers in the European parts of the Empire. Tophane and Mersin were ports in this period and Sivas was a trade center in Anatolia; however, there is no information about these clock towers were built in these cities.

In the period of the Abdülaziz (1861-1876), six clock towers[295] were built in Anatolia, in Bursa (about the period of Abdülaziz), Amasya (1865), Merzifon (1866), Niğde (1866), Konya (1872), and Zile (1875). These cities were in central Anatolia. Most likely these were built in competition for city prestige or there were no *muvakkithane* in these cities, except for in Amasya.

In the period of the Abdülhamid (1876-1908), thirty-six clock towers[296] were built in Anatolia in Erzurum (1881, there was a clock in this tower in 1842), Adana (1882), Bolu-Gerede (1882), Ankara (1884), Kastamonu (1884-5), Muğla (1885), Edirne (1886), Istanbul-Sirkeci (1890), Çorum-Sungurlu (1891), Erzincan (1891-2), Istanbul-Yıldız Sarayı (1892-93), Istanbul-Dolmabahçe (1894), Çorum-Mecitözü (1894), Mersin-Tarsus (1895), Çorum (1896), Istanbul-Şişli Efdal (1897-98), Çanakkale (1897-98), Samsun-Ladik (1889), Amasya-Gümüşhacıköy (1900), Ankara-Sivrihisar (1900), Izmir (1901), Diyarbakır (1901), Yozgat-Hamidiye (1901), Tokat (1901-2), Elazığ-Maden (1901-2), Izmit (1902-3), Istanbul-Haydarpaşa Lisesi (1903), Bursa (1904), Kayseri (1906), Samsun-Vezirköprü (1906-8), Bilecik (1907), Yozgat (1908), Antalya (about the period of Abdülhamid II), İzmir-Bergama (about the period of Abdülhamid II), Çankırı (about the period of Abdülhamid II), and Kütahya (about the period of Abdülhamid II).

Clock towers were built in the port cities of Adana, Istanbul (Sirkeci, Yıldız Sarayı, Dolmabahçe, and Şişli Efdal), Mersin-Tarsus, Çanakkale, Izmir, and Izmit. The other twenty-seven clock towers were built in the central Anatolia. At this point,

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[295] Ibid., pp. 7-45.
[296] Ibid., pp. 7-45.

we can say that most clock towers that were built at the period of the Abdülhamid II were constructed as a city decoration that could cause the modernization of urban life as in most of the cities, as mentioned above, there were no factory workers like in the European experiences. Most of the Anatolian cities that had a public clock had no factories or other types of modern working establishments in this period.

In the Republican era, nine clock towers were built, in Bayburt (29 October 1924), Göynük (about 1920s), Iskenderun (1925), Urfa (1927-1945), Sinop, Siirt (1974-5), Çorum-Alaca (1980s), Amasya-Yerköy (1985-6), Karabük (1987), and Kırıkkale (1991). There seems to have been no special relationship to construction of these clocks. They were built for the decoration of the cities.[297]

Why were clock towers built later in the Ottoman Empire than in Europe?

Dizer's answer to this question is the *ezani* hour system, by which clocks were set every day according to the sun. Clocks which were in mosques and houses could be set every day; however, setting those in clock towers was hard work.[298] This interpretation contains truth; however, almost all of the clock towers in the Ottoman Empire showed the clock according to *ezani* hour system. Some of them, at the beginning of the twentieth century, showed the time according to *alafranga* hour system.

Acun's answer is that the clocks in towers had accuracy problems, up to two and a half hours. Accuracy problems could cause on fix *namaz* times, because the period between *akşam namazı* and *yatsı namazı* is at least one or two hours in day according to regions.[299] The first clock towers had showed the time with accuracy problem, however, these machines were developed and their accuracy problems were

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[297] For the map of clock toers in Anatolia (is quoted from Acun, *Anadolu Saat Kuleleri*, p. 64.) look at Appendix, p. 159.
[298] Dizer, "İslamda ve Osmanlılarda Saat," p. 14.; Özdemir, p. 165.
[299] Acun, *Anadolu Saat Kuleleri*, p. 55.

solved in Europe in the same period. Clock machine caused to be made without accuracy problems in the seventeenth century. Nevertheless, the clock towers became widespread at the second part of the nineteenth century.

Acun's second answer is the tradition of *muvakkithane*, which determined and announced the time to the people. These places had clocks and people could see the clocks outside the *muvakkithane*. The *muvakkithane* already fulfilled the task of the clock tower.[300] This interpretation is true because, the clock towers was/is a public clock to show time to the people. The *muvakkithanes* had already taken care of this problem in the Empire.

The spread of clock towers can be analyzed as a process of urban modernization. Modernization, in this context, has to be understood as an abandonment of traditional ways of life. The building of the clock towers can be compared with the introduction of telegraph and railway in the Ottoman. These technological tools modernized the Ottoman cities. Why were the clock towers built when there were many *muvakkithanes* in the Ottoman cities? When the clock towers were built in many parts of the Empire, there was at least one *muvakkithane* in each city. This question can be answered only with the new urbanization mentalit, which sought to build cities that were similar to European cities.

With the public clock, the government sought to introduce a new time consciousness to the people. Train travel required a new time schedule and mentality in the Empire. And new economic development needed more synchronized trade relationships, especially in port cities and trade centers. We can evaluated the spreading of the clock towers in the period of Abdülhamid II at the time of the spread

[300] Ibid., p. 55.

of the modern working, education, and life style, that the construction of the modern state organization and relationships to the provinces.

Clock towers spread throughout the Empire during the reign of Abdülhamid II. By imperial command, the number of clock towers was increased. In 1901, Abdülhamid II sent a command to the governors of the provinces to build clock towers.[301] In celebration of twenty-fiftieth and thirtieth anniversaries of the ascent to the throne of Abdülhamid II, towers were built in every part of the Empire.

The building of clock towers in Anatolia was done by local governors. Philanthropists also supported their construction.

The clocks which, everywhere, were erected opposite church bell towers in Europe, represented a great revolution of the communal movement in the time domain The clock tower was erected to spread secular time conceptions and secular ideas as in Europe.[302] It can be said that the clock towers were built as an alternative area to the *mosque* in the period of Abdülhamid II. When we compare the number of clock tower and the *mosque* that were built in the reign of Abdülhamid II, the number of clock tower was greater. The clock towers were an alternative city square to develop a new city plan. The old cities had been built around the mosques. With the spreading of the clock tower, the new city center became around of the clock towers. These caused a new relationships centered around the clock. The public clock was viewed as an indicator of modernity.

Clock towers also came to symbolize Abdülhamid II. In Izmir, in 1908, after the proclamation of second constitution, students who attended the school opposite the

[301] Enver Behnan Şapolyo, "Saat Kulelerimiz," *Önasya* 44 (1969), pp. 10-1.
[302] Le Goff, p. 36.

Izmir clock tower put a rope around it and they tried to pull it down in protest of the Hamidian regime.[303]

Common features of the clock towers of the era were chimes that rang on the hour, mechanism that were set once in fifteen days or a month, and towers with one or more dials.[304] They worked according to the *ezani* hour system and their dials had Arabic numerals. In the Republican era, in 1928, clocks began to work according to the *vasati* hour system and their dials were changed to Roman numerals. Moreover, in some clock towers, the Arabic numerals also were shifted to one side of tower, and these on the other side were changed to Roman numerals.[305]

The clock towers were built near official buildings, like the local municipality, to spread the western type of time conception. Thus, official establishments and other services began to work according to the *alafranga* hour system after 1910.

The public clocks, private clocks and new time systems caused a more synchronized society. The schedule government offices and train travel required new time discipline based on the *alafranga* system. The *ezani* system was used in daily life; however, people modernized their mentalities in relation to new machines or organizations.

The spread of clock towers can be interpreted to mean the introduction of modern working system to officials, students, and the citizens who came to the official building to solve their problems or take care of work. Clock towers taught clocks and western types of clocks to the common people.

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[303] Yasar Aksoy. *Bir Kent Bir Insan-Izmirin Son Yüzyılı, S. Ferit Eczabaşı'nın Yaşamı ve Anıları* (İstanbul: Dr. Nejat F. Eczacıbaşı Vakfı Yayınları, 1986), p. 88.
[304] Acun, p. 6.
[305] Ibid., p. 6.

CHAPTER V

THE CONCEPT OF TIME IN THE OTTOMAN EMPIRE

In Islamic societies, prayer times and religious days are determined by the movement of the sun and moon, according to the Koran and the *hadis*. The daily five prayer times are designated by the sun and every day begins from evening. Moreover, religious months are determined by the movement of the moon, with every month beginning from the new moon. This time conception is related to the natural circle, like those of many other religious societies, such as the Jews and the early Christians. Unlike the other religions, however, in Islam, it is necessary to determine evening, *yatsı* (a time about two hours after sunset), morning, noon, and afternoon times. This necessity led to the development of accurate time measurement systems in Islamic society. In Christianity, there are some daily rites which are announced by ringing church bells, but attending these prayers is not an obligation to every Christian, unlike in Islam where every believer must pray five times a day.

The *ezani* or *gurubi* hours were called *alaturka* in the late period of the Ottoman Empire. In this system, the day begins from sunset and people wake up before sun rise. After the *sabah namaz* (morning prayer) they begin their day, working until roughly noon, when there is another prayer time. Once again, the day ends at sun set. This hour system is called *akşam bağlantılı* (connected to evening).

In the Ottoman Empire, gnomons were used to determine the daily hours. People used *öğle* (noon), *ikindi* (afternoon), *akşam* (evening), *yatsı* (a time about two hours after sunset), and *sabah* (morning) designations to understand the time. These conceptions, however, were not accurate, just approximations. People who lived in rural areas did not need to know the exact time for their daily habits. They learnt the time from the *ezan* (call to prayer) and they did their work according to that. This type of time is natural time; people had lived according to natural events and everyone knew its signs on nature.

In the thirteenth century, the first mechanical clocks did not have dials, they announced the hour with gongs. In the fourteenth century, dials were set into clocks in Europe, although in this period the clocks showed only hours, and at least one hour incorrectly. With some development, the Europeans began to produce more accurate clocks. With the development of industry and transportation vehicles, the importance of minutes and seconds emerged. The second became important with the invention of the chronometer. Clocks began to be seen in homes to determine time accurately, especially in the West.

In the Ottoman Empire, mechanical clocks were not widespread until the late nineteenth century. In this era, mechanical tools, for instance railways, became important instruments in daily life and changed the time conception not only in the West but everywhere else as well.

The railways symbolized modernity in the nineteenth century. The railroad shortened both distance and time and it transformed the geography. In 1850, Lardner wrote in his book *Railway Economy* that the "annihilation of space and time was the early-nineteenth century characterization of the effect of railroad travel. The concept was based on the speed that the new means of transport was able to achieve. A given

spatial distance, traditionally covered in a fixed amount of travel time, could suddenly be dealt with in a fraction of that time."[306]

The development of the railways in the Empire began after the 1850s. The improvement of railways was achieved with foreign enterprises, which constructed the railway according to the needs of trade in the Empire in that period. Toprak, describing the development of the railway in the Empire writes, "in terms of cause and effect, railways represented an effect for most of the industrialized countries, whereas they may be perceived as a cause for the developing countries; and as such were a factor both representing and lending the momentum to development and transformation. In the Ottoman Turkish experience, the railway was not an outcome of modernization, but a vehicle by which it came about. The country acquired a railway without an industrial revolution, and the railway played a fundamental role in the country's metamorphosis."[307] In the Empire, there was no industrial infrastructure. The modernization came to the Empire with industrial machines. The mechanic clock was the first industrial machine in the ordinary people lives. Nevertheless, the people used it according to their natural needs; that is, they could set their clock according to the *ezani* hour system. They accepted the clock in their culture. However, the train came with its' own rules. It destroyed the traditional living style. The Ottomans were not able produce to maintain their traditional life style with the train.

Commercial concerns were a primary motivation for the construction of the first Ottoman railways, and the railways played a major part in the rapid rise of the Ottoman trade volume in the second half of the nineteenth century. Thanks to the

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[306] D. Lardner. *Railway Economy* (London, 1850) p. 35 qouted by Wolfgang Schivelbusch. *Railway Journey -The Industrialization of Time and Space in the 19th Century-* (Chigago: University of California Press, 1986), p. 32.
[307] Zafer Toprak. "Railways, the States and Modernity," *Demiryol -Tren Çagı-* (İstanbul: Yapı Kredi Kültür Sanat Yayıncılık, 2003), p. 11.

railways, Ottoman Turkey became integrated with the world economy and an extension of world markets.[308] This development caused new types of relationships between World-Empire, among provinces, and people. The people began to recognize punctuality and schedule in daily life.

With the railroads, the time and the distance were changed according to new time standards. Schivelbusch describes the changing of the time conception after the construction of the railroads:

> The regions lost their temporal identity in an entirely concrete sense: the railroads deprived them of their local time. As long as they remained isolated from each other, they had their individual times: London time ran four minutes ahead of time in Reading, seven minutes and thirty seconds ahead of Cirencester time, and fourteen minutes ahead of Bridgwater time... the trains forced the differing local times to confront each other. Under traditional circumstances, a supra-regional schedule would be impossible: times of departure and arrival are valid only for the place whose local time is being used. For the next station, with its own time, that previous time is no longer valid. Regular traffic needs standardized time; this is analogous to the way in which the machine ensemble constituted by rail and carriage undermined individual traffic and brought about the transportation monopoly.[309]

The traffic between the places produced synchronization among the people and places. Temporal references became blurred and standard time units became the main dimension of life. Modern temporal coordination relies heavily on the use of the time table, and it is important to note that the railroads were primarily responsible for spreading the use modern institutions.

In the Ottoman Empire, as stated, the traditional time conception maintained its validity until the development of mechanical transportation techniques. The train was not a transportation machine, it represented a different life-style and its own life-style put order to time. Toprak writes that

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[308] Ibid., p. 12.
[309] Schivelbusch, p. 43.

> The railways changed the Ottoman way of life, and train stations all over the country became symbols of their age. The railways also transformed Ottoman concepts of time and places. The traditional division of the daylight hours into sections by the five times of prayer was not appropriate for railway timetables. The need for punctuality in train departures and arrivals made it necessary to introduce European time wherever the railway reached, dividing the day into twenty-four hours of equal length, irrespective of seasonal changes in the length of daylight and darkness.[310]

The abolition of the local time-reckoning practices and introduction of supralocal standards of time mark a most significant point for man's relation to time, namely, the transition from a naturally based manner of time-reckoning to a socially based one. The second one is produced in the mind and every person who lives in the same society learns this social standard time to maintain his activities. In the Empire, with the technological tools, the time-reckoning was changed from a natural to an artificial one. Nevertheless, these two systems mixed with each other in the same community in the transition period that contiuned until 1924.

Toprak also writes about the dual system of time that, "the duality of parallel institutions and customs, Islamic on the one hand and those of Europe on the other, now affected even time on account of the railways... so *ezani* versus *zevali* time coexisted. Now minutes became as important as hours, since trains left and arrived on the minute. This was crucial because trains in both directions were using the same single line."[311] The duality in education, justice and other aspect of life was maintained with time. The duality in time produced a synchronization problem in society; however, people could use two or more time standards in their relationships. Three calendars and two hour systems were used in the same society. People used all of them according to their needs; moreover, they were able to solve their problem of arrangement in chaos.

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[310] Toprak, p. 13.
[311] Ibid., p. 13.

The time conception began to contain two dimensions: the first one was *ezani* (*alaturka*) the other one was *vasati* (*alafranga*). Indeed, this phenomenon was experienced throughout the world in any place that had railways. The local or temporal time became the mean time and the clocks began to be set according to the station at Greenwich. The precise standardization of time measurement dates from the foundation of the Royal observatory in 1675. Like the later standard time, the original Greenwich Time was created to meet the needs of expanding traffic, i.e., shipping, in the seventeenth century. Vessels carried Greenwich Time with them on their chronometers, as it was necessary for orientation and navigation. However, it was not used as a generalized norm for the division of the day: Greenwich Time was still restricted to the walls of the cabinet that contained the chronometer during the voyage.[312]

The standardization of time in Europe continued until the beginning of the twentieth century. The United States, accepted standardized time officially in 1918. This acceptance period is described by Schivelbusch:

> Yet railroad time was not accepted as anything but schedule time until late in the century. As the rail network grew denser, incorporating more and more regions, the retention of local times became untenable: in 1880, railroad time became the general standard time in England. In Germany, official recognition came in 1893. As early as 1884, an international conference on time standards, held in Washington DC, divided the world into time zones.[313]

The unification of time and its affect on daily life were thus achieved during one century. The *ezani* hour system was a kind of temporal reference like in other part of the world. In the Empire, the railroad companies used their own time-table to their journey; there was no synchronicity in the Empire. In the Republican era, in 1924, the

[312] Schivelbusch, pp. 43-4.
[313] Ibid., p. 44.

parliament accepted one time system that was valid for every part of the Anatolia with the acceptance of the world time zones.

The duality between the *ezani* and *alafranga* hour systems could not be solved in the Empire. The new technology and a life-style needed new time standard; however, the duality was maintained in every area. Some proposals were prepared to the government to change the hour system. Ahmet Samim wrote, in 1910, that Ahmet Muhtar Paşa had prepared a proposal to establish a center which showed the *alafranga* hours to people to set their clocks to it in 1910.[314] He also wrote that in this period, the Ministry of Finance, the Ministry of Foreign Affairs, the parliament, and some government offices had put *alafranga* clocks in their buildings. However, this was not enough to develop the *alafranga* hour in society. He gives as an example from thirty years earlier, when a gun was fired in Tophane square so that people could set their clocks according to the *vasati* (*alafranga*) hours.[315] Also, a black shell was taken down from the Galata towers at noon (12:00) by the Beyoğlu Municipality so that people could set their clocks.[316] These examples show that the *alafranga* hour system was used on the social level and the government tried to solve the synchronization problem between people who used this hour system. However, the government did not accept the changing of the hour system as it did the calendar issue.

The *alafranga* hours were used in the stock markets and international trade. Moreover, the Levantines used these hours in their daily life. For example, in Istanbul, two hour systems were used in the same city, the *alafranga* was used at Pera and the *ezani* was used at Fatih. Two different hour systems were valid in daily life.

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[314] Ahmet Samim. "Vaktimizi Bilelim," *Sadayi Millet*, no: 111 (21 Mart 1910), p. 1.
[315] Ibid., p. 2.
[316] Wolfgang Meyer, *İstanbul da Güneş Saatleri*, p. 5.

Moreover, when we look at the Beyoğlu Municipality marriage records,[317] the birth dates were written according to different calendar system the *Rumi*, the Julian, and the Gregorian. Besides these, the marriage dates were given with the *Hicri* dates.

In the Ottoman Empire, the *vasati* hour system was adopted during the Balkan Wars.[318] The defeat of the Ottoman Army was related to the lack of the *alaturka* hour system because there was no synchronism in the army according to that hour system.

The novels of the late nineteenth and early twentieth century illustrate the time conception of that era. Ahmet Rasim describes the words used in regards to time in *Muharrir Bu Ya*:

> In my childhood, there were three clocks. The first one was a *Piryol* (it came from Perior, a well-known clock making family) clock called *maşalı* (escapement) *mandallı* (with pawl) *dolaplı* (with box). The second one was a *divanhane* and *muvakkithane* clock, and the third one was a clock with covered glass, like a dome, which sang "*Aman aman Bağdatlı / Cilvesi baldan tatlı*" (Oof oof from Baghdad / Her flirtatiousness is sweeter than honey). Cuckoo clocks, which were put in houses, came after these." He writes that the "women in neighborhoods said, 'Well! Has seller of yogurt passed? Well! It is *ikindi* (afternoon)! Mother! Have you performed your *namaz* (ritual worship centered in prayer)?' When the gas seller shouts: 'How awful! It is evening; I am still in the kitchen! How I suffer.'[319]

In this passage, the woman recognized the time according to their daily habits. The daily events became a reality in a circle based on natural events. Social events

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[317] These records are at the Beyoğlu Belediyesi Beyoğlu Araştırmaları Merkezi Kütüphanesi.

[318] Toprak, p. 13.

[319] Ahmet Rasim. *Muharrir Bu Ya,* hazırlayan. Hikmet Dizdaroğlu, (Milli Eğitim Bakanlığı Yayınları: İstanbul, 1990), p. 326. *"Benim Çocukluğumda saat adına bir Piryol ile maşalımı, madallı mı, dolaplı mı ne derler, o saatlerle divanhane ve muvakkithane saatleri, bir de kurulunca: "Aman aman Bağdatlı / Cilvesi baldan tatlı."*
şarkısını çağıran kubbe şeklinde cam kablı saatler vardı. Evde, şunda, bunda, şurada, burada; guguklu saatler bundan sonradır. Mahallelerde bile kadınlar, yoğurçu geçtimi:
- Ayol ikindi oldu! Anne, namazını kıl!;
Gazcı bağırdı mı:
- Eyvah! Akşamlar oldu, ben hala mutfaktayım!... Nedir bu benim çilem! Derler, okullarda ilmihal hocaları namaz vakitlerini tarif ederken:
- Ağaçların, dümdüz dikili şeylerin gölgeleri diplerine çekilip de bir karış kadar uzamaya başladı mı öğle , upuzun oldu mu ikindi vaktidir. Akşam namazının vakti, karşıdan gelen Müslüman mı, Hıristiyan mı frak olunur olunmaz olduğu zamandır. Yatsı' nın sabaha kadar müsadesi vardır. diye açıklarlardı.

were related with natural events and people set up their work according to themselves, not artificial ones. Natural time could determine the life in the city.

Rasim describes the time of prayers as "when the shadow a bar gets longer very few, it is *öğle* (noon); when the shadow a bar gets very long, it is *ikindi* (afternoon); when the sun sets, it is *akşam* (evening); *yatsı* is the time from evening to morning."[320] In traditional society, every person could determine the time from the natural events. According to Mumford, the transition to abstract, measured hours and minutes, is a process of alienation from nature.[321] The new conception of time lost its organic dimension. The ordinary Muslim people learned to determine the prayer times from *ilmihal* books (book explaining the principles of Islam). From this transition people lost their contact with nature and natural events.

Rasim explains the words the Ottomans used about time. From these descriptions it is clear that there were no accurate terms and that people understood time according to the prayer times or daily events that occurred at the same time every day. Then, he describes how an Ottoman determined the time without a clock. This bar usage was widespread throughout the rural areas. Moreover, each Ottoman mosque had at least one gnomon to determine the time.[322] The gnomons were at most mosques; however, with the spread of the mechanical clock, people determined the time according to their own principles. Probably, they were used to only some control with mechanical clocks.

The concept of the perception of time changes according to the culture. This difference can be seen in working life. In the West, people have a very accurate time conception in comparison to those in the East after achieving the standard time system in their countries. These differences in time conceptions influence the daily

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[320] Ibid., p. 326.
[321] Lewis Mumford. *Technics and Civilization* (New York: 1934), p. 20 qouted by Rossum, p. 11.
[322] Meyer, *İstanbul da Güneş Saatleri*, pp. 35-93; Nusret Çam, *Osmanlı Güneş Saatleri*, pp. 9-21.

work life. In the Ottoman Empire, in the *ezani* hour system, people worked from the sun rise to sunset. Thus, in summer, people worked thirteen or sixteen hours in a day. Nevertheless, the workers who came from European countries worked only eight hours a day; they earned more money than the Ottomans and had one leisure day per week. For this reason, some Ottoman workers went on strike.[323] In the Europe, the workers maintained the eight hour working day. In the same period, in the Ottoman, workers worked at least thirteen hours a day. After some strikes in 1908, the working hours were decreased in some fields.

The duality between the two hour systems can be seen in the novels of the era. Ahmet Mithat Efendi used *alafranga* hours in his novels, although he criticized the usage of *alafranga* hours by the people who lived in Pera. In his novel *Ahmet Metin ve Şirzad,* Ahmet Metin set his clock according to the *alafranga* hour. He wrote that, "in livelihood, the *alafranga* hour is not like the *alaturka* hour that varies and is not unchangeable. He sets his clock according to the *alafranga* hour, according to which the chronometer clock of the ship was set to determine the longitude. For this reason, the livelihood was set according to it."[324] He liked *alafranga* hours; however, he did not accept its use it in daily life. Although it supplied the synchronicity, it pertained to the western life-style.

When Ahmet Mithat Efendi visited a clock shop in Switzerland, he saw a clock that showed one sixtieth of a second. He realized that the Ottoman Muslims did not consider minutes important while the Swiss considered one sixtieth of a second. He wrote, "we do not consider minutes important. It is not important whether our

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[323] Mesut Gülmez. "Tanzimat'tan Sonra işçi Örgütlenmesi ve Çalışma Koşulları (1839-1919)" *Tanzimat'tan Cumhuriyet'e Türkiye Ansiklopedisi III* (İstanbul: İletişim Yayınları, 1985), pp. 792-802.

[324] Ahmet Mithat Efendi. *Ahmet Metin ve Şirzad –yahud- Roman içinde Roman* (İstanbul, 1329), p. 126. qouted by Orhan Okay. *Batı Medeniyeti Karşısında Ahmet Mithat Efendi*, p. 110. *"Maişet hususunda alafranga saatler alaturkalar gibi muhtelif olmayıp layetegayyer olduğundan maişetini o saatlere tatbik etmişti ki zaten tul derecelerini tayin etmek için geminin kronometro saati hep alafranga istimal olunmak lazım gelmekle maişetin de bu saatlere tatbiki lazım gelmişti."*

attempts are done after or later. We understand that people who are interested in astronomy and calculation consider one sixtieth of a second important with the clock which was shown by Monsieur Bahman; however, I do not know if our navy considers it important."[325]

He wrote in *Peder Olmak Sanatı* that, "the style of this society is the statement that time is money. They work six days a week, in which their work is more than our one month's work and our lazy do not finish. One of their weeks equals our three or probably six months. When Sunday comes, nobody works in England. It is even banned by law."[326]

At the end of the nineteenth century, only the sellers of vegetables and fruits worked overtime, at night, during the transportation period. At this time in Europe, there were improvements in industry and they developed a new style of working. On this subject, Ahmet Mithad Efendi wrote in *Müşahedat* that people worked at night in Europe and he supported working overtime at night.[327]

At this time, there was no conception of holiday or a day off in the Empire. He criticized working life and he tried to explain what could be done to develop working life in the Empire. He argued that leisure times was important for working life in order to ensure a more productive person who worked six days a week. These people produced more than those who did not have holidays.[328]

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[325] Ahmet Mithat Efendi. *Avrupa da Bir Cevelan* (İstanbul, 1307), p. 828 quoted by Okay, p. 110. *"Malum a, biz dakikalara bile ehemmiyet vermeyiz. Herhangi teşebbüsümüz olursa olsun bir dakika tekaddüm ve teehhür bizce pek de mucib-i ehemmiyet olmaz. Bazı bahriyunumuzun saniyeye kadar aksam-ı zamana ehemmiyet verip vermediklerini bilemez isek de hesabat ve tedkikat-ı hey iye ile iştigal edenlerin bir saniyenin altmış cüzünden bir cüzü olan saliseye ehemmiyet verdiklerini şu Mösyö Bahman ın bize gösterdiği saliseli saatlerden anladık."*

[326] Ahmet Mithat Efendi. *Peder Olmak Sanatı* (İstanbul, 1317), p. 136 quoted by Okay; p. 110. *"Bu milletin tırazı vakit nakittir, cümlesi olup bir haftayı teşkil eden yedi günün altısında o kadar çalışırlar ki bizim en çalışkanlarımız için measinin bu derecesi bir ayda, hele tenperver olanlarımız için üç ve belki altı ayda bile müyesser olamaz. Pazar günü geldi mi İngiltere de hiçbir kimse çalışmaz. Hatta kanunen dahi memnudur."*

[327] Ahmet Mithat Efendi. *Müşahedat* (İstanbul, 1308), p. 47 quoted by Okay, p. 115-6.

[328] Ahmet Mithat Efendi. *Obur* (İstanbul, 1302), p. 47 quoted by Okay, p. 116.

In the Ottoman Empire, the *ezani* hour system was changed around 1910; that is, after the proclamation of the second constitution. This change was described by Falih Rıfkı (Atay) in an article in *Eski Saat* in 1918. He saw the changing of the hour system as a revolution in the Ottoman period. He wrote, "when I read the newspaper, I saw an article with the text "*Artık Alafranga Saat Kullanılacakmış*" (from now on *alafranga* hour will be used). This innovation affected me like looking at brilliant things."[329] He also described how people reacted to this change. He told of his school life in which the old time was announced by the *hademe* (person who does cleaning and runs errands in a school) and the new was announced by the teacher, who was a supporter of the constitution.[330]

"When I was a child, the days were not like machines. We did not become aware of *öğle* (noon) until *öğle ezanı*. Every hour had its own meaning in the afternoon... There were different hours and breaks in the morning, at noon, and in the afternoon. The hours had *makam* (a concept of melodic creation that determines tonal relations, tessitura, starting tone, reciting tone, and the finalis), like the *ezans*, which were announced with different *makam* according to the *namaz* times."[331] Every time had its own meaning in traditional societies. In artificial times, all time is the same unit and it is divided into parts according to people's needs. On the contrary, in the natural time, people give different meanings to every time passage. Time is not a matter of spending or wasting, it is organic unit to live in harmony.

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[329] Falih Rıfkı (Atay). "Eski Saat," *Eski Saat* (İstanbul: Akşam Matbaası, 1933), p. 18.
[330] Ibid., pp. 19-20.
[331] Ibid., pp. 21-2. "*Ben çocukken günler böyle makinemsi değildi. Öğle ezanına kadar zaman denen şeyi hissetmezdik. Öğleden sonra her saatin kendine has bir hayatı vardı. Bunlar, birer birer, gittikçe daha yoğunlaşarak, dinlenmeğe ve uyumağa gidiyormuş gibi, geçerdi. Sabah, öğle ve ikindi saatlerinin havaları ve teneffüsleri bile başka idi. Ezanlar gibi, sanki saatler de makamlanmıştı: Sabah salaları, fecrin nemli, serin saatinde, ümit ve heves vererek çağırırdı. Öğleyin, tepeden inen güneş, zamanı silmiş gibidir; onun ezanında bir ahretsizlik, bir katılık ve maddelik vardı. İkindi günün gevşiyen bir saatindedir. Ondan sonra akşam var; iş adamlarının dönüşü, rahat, minder ve entari var. Saati, batı rengi kadar çabuk, uçar gibi geçen, akşam ezanını müezzinler ir şeyden kaçıyor gibi hızlı ve ürkek sesle okurlardı. Çocukken akşam ezanını tenhalık mahallelerde dinlememiş olanlar, bunun ruha verdiği sinmişliği anlayamazlar.*"

As an example, he wrote that he went to school according to *ezani* hour. He described how "we were invited at half past three on winter mornings and at one or half past one on summer mornings."[332] The *muvakkithane* is described as an old fashioned religious symbol.[333] In 1910s, the *muvakkithane* were evaluated as old symbols. It is interesting that the *muvakkits* used modern clocks and techniques in this time. However, they represented as a duality in time. In the *muvakkithane*, two times were calculated and they were shown at their windows. However, the main profession of *muvakkit* was calculating religious times. For this reason, they are evaluated as an old fashioned.

Ahmet Haşim evaluated the changing of the hour system in the Turkey in an article titled "*Müslüman Saati*" in 1921. He writes that, "the most effective and secret invasion which changed Istanbul and bewildered its inhabitants was the arrival of foreign hours to our lives... in the old times, we had our hours and days, like our own way of living, thinking, manner of dressing, and our own discrimination that was caused from religion, race, and tradition."[334] He evaluated the time systems from a cultural stand point after the abolition of the *ezani* hours in practice. He maintained that this hour system had supplied thinking and the way of living. However, after the arrival of the *alafranga* hour system, their lives had been destroyed.

Haşim wrote that the *alafranga* hour system, which began at 24:00 and has 24 equal hours, was worse than the *ezani* hour system, which had twelve hours, and according to which living was very easy. These days were happy for Muslims; they measured honorable days by the *ezani*.[335] He said that, "although the *ezani* hour was

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[332] Ibid., p. 22. "*Şu ses, kış sabahları saat üç buçuğun ve yaz sabahları saat bir veya bir buçuğun sesi hala kulağımda uğuldar: -Haydi mektep!*"
[333] Ibid., p. 23.
[334] Ahmet Haşim. "Müslüman Saati," *Dergah* 1, no. 3, (16 Mayıs 1337/1921) is quoted from *Cogito* 22 (Bahar 2000), p. 223.
[335] Ibid., p. 223.

wrong and primitive according to astronomic calculations, this hour was the sacred hour in our memories. The acceptance of *zevali* hours in practice and conduct and the return of the *ezani* to the mosques, tombs, and *muvakkithanes* caused the *ezani* hours to become the *eski saat* (old hour), which negatively affected the way of life... The old hours were at the death of our father, the marriage of our mother, our birthday, the movement of *kervans* (caravans), and our armies entering into enemy cities."[336] He argued that this new system was not suitable to their live. It came from a different culture and these hours were painful for cultures in which salvers are worked more. Although he accepted the negative dimension of the *ezani* hour system, he wanted old system to live the old way again.

Ahmet Haşim maintained his claims about the changing of the day concept of among Muslims. He explored what the times in the day meant and claimed that Muslims were forgetting their natural day conception and had begun to accept the new day conception, which was foreign to their culture. He ended his statements by saying, "today, a clock in a Muslim house shows the night hours as daytime and daytime hours as night, like it shows a different world's hour. We get lost in time as if we were lost in the desert."[337] The new time conception was uniform, homogenous, it was purely quantitative. The old time was organic, had different meanings, and it was natural and sensible. The new system was alienated from our world, according to Haşim.

Despite this protest, Ahmet Hamdi Tanpınar noted the Ottoman's great interest in mechanical clocks. He wrote about the transformation period from the *Tanzimat* (administrative reforms in Ottoman Empire began in 1839) to the Republic in his book, *Saatleri Ayarlama Enstitüsü*. "Indeed, the major customers of European

[336] Ibid., p. 223.
[337] Ibid., p. 223.

clockmakers are Muslims, most of whom are Ottoman people who are the most devout Muslims. They use the clock in the daily five prayer times, *iftar* (breaking a fast) in Ramadan, *sahur* (meal taken just before dawn during the Ramadan fast), and every worship. The clock is a key to finding God and was adequate for the ancients."[338] He maintained that "there were frequently *muvakkithanes*." Also, he described the behavior of people in front of the *muvakkithane*.

Tanpınar in *Beş Şehir* explained how in old Istanbul, time had been experienced as an *alay* (crowd participating in an outdoor meeting).[339] He also wrote that in the old life, the calendar was celestial.[340] Abdullah Şinasi Hisar, in his book *Boğaziçi Yalıları*, wrote that old people followed the time and they showed interest in clocks as sacred things that showed the prayer times.[341] Two of them evaluated the old time as a sacred item. They were only interested in its social reminiscence dimension. The old time conception becomes a missing item that remained the old times according to these writers.

[338] Ahmet Hamdi Tanpınar. *Saatleri Ayarlama Enstitüsü* (İstanbul: Dergah Yayınları, 1979), p. 23.
[339] Ahmet Hamdi Tanpınar. *Beş Şehir* (İstanbul: Yapı Kredi Kültür Sanat Yayıncılık, 2002), p. 158.
[340] Ibid., p.163.
[341] Abdülhak Şinasi Hisar. *Boğaziçi Yalıları* (İstanbul: Varlık Yayınları, 1954), p. 73.

CHAPTER VI

CONCLUSION

This thesis, which investigated the time measurement systems and its social meaning in daily life, problematized the modernization and secularization of time conception from the Ottoman Empire to the Republic of Turkey. In this context, secularization engendered the destruction of religious practice in daily life; secularization was the destructive movement that did not construct new models for daily life. Modernization means, in this thesis context, the demolition of the traditional way of living. Both of these terms had destructive dimension to Ottoman society. The Turkish modernization experience can be analyzed according to time perception. The time perception and its life structures were based on the natural circle and on religious meanings. After technological tools entered daily life, they brought new rules to daily life. At this point, the changing of time was not a symbological modernization effect, like the hat reform, it was inner reform for daily practice. The life practice and mentality of the people were changed with time modernization.

The reform movements in the Ottoman Empire were begun from the Selim III era. The modernization efforts in this period come with their culture. The western technologies introduced a western style of life to the people of the Empire. This was a pragmatic relationship, because most the Ottomans, in the early modernization period, wanted to have only western technology; however, the western techniques came with its lifestyle and it shook the traditional way of living. The study of process

the changing of time conception and its process in Turkey enables us to understand the secularization and its effect on society, both on the Muslim and non-Muslims.

The ancient societies, like many agricultural societies later, had lived according to natural time. They began their work at sunrise and finished at sunset. Moreover, time had religious and supernatural meanings, which was calculated by the priests. The development of trade and mechanization of production provided a new style of life that was based a secular foundation. After the renaissance and reformation in Europe, the relationship between the individual, society, and nature altered and was adapted to the emerging new world order.

The people began to move away from religion and religion-based ways of living; however, time continued to be measured by clerics and to be experienced within a religious framework. The reformation of the calendar in Europe and developments in mechanical clock production techniques supplied the unification of time conception in the West. The Gregorian calendar was accepted over a period of three hundred years in Europe. Most European countries accepted the Gregorian calendar only at the beginning of the twentieth century. The standardizing of time was achieved in the same period in Europe, as in the Empire.

In the Ottoman Empire, the office of the *müneccimbaşı* prepared calendars for the Sultan and the officials, using astronomical measurement techniques; however, they determined the *eşref saati* (the time deemed suitable for doing something), which was a supernatural time conception, using astrology.

The *Hicri* calendar was an official calendar and the Muslim people lived according to it. The main specialty of this calendar was that it was measurable by everyone with no tools. For this reason, it was embraced by the ordinary Muslim people. However, at the fiscal level, taxes were collected according to the solar cycle

and the government paid its expenditures according to the lunar year. This inharmonious situation led the government to use the *Rumi* calendar, which was based on the solar cycle. In the early period, the treasury calculated its budget according to the solar cycle; however, it did not use any official calendar. At the beginning of the eighteenth century, the *Rumi* calendar was developed and it was used at the fiscal level. The *Rumi* calendar began to be used at the social level, especially among westernized intellectuals, after the 1860s. Because of the omission of the *sıvış* year, the *Rumi* calendar was calculated over one year and this fault increased in an orderly fashion.

The calendar discussions in the late period did not supply a suitable calendar to the Empire. In spite of the proposals by intellectuals interested in the calendar systems of many proposals to the Palace, in the later period, the parliament, the government, rejected them and the confusion rapidly increased as the number of modern institutions continued to grow.

In the late period, the Ottoman officials rejected the Gregorian calendar because it was based on Christianity. It is argued here that if we consider the acceptance period of the Gregorian calendar in the Western countries, we see that the acceptance in Catholic countries took three hundred years. Perhaps in this period of time, the Ottoman Empire could have produced its own solar calendar based on Islamic roots, as was suggested by Ahmet Muhar Paşa, Ahmet Şakir Paşa, and others.

In 1917, the *takvim-i garbi* (a kind of Gregorian calendar) was accepted by the parliament; however, it was implemented only partially. For instance, the years were numbered according to the *Hicri* calendar. Indeed, this application was a revolution in the Empire, because the western calendar system had been adapted already by countries like Russia and Greece. However, the new calendar system was not carried

out at every level. It was used mostly to record birth dates, the dates of buildings, and some registrations. Furthermore, the *Hicri* calendar was maintained as an official calendar until the Republican era. Nevertheless, in practice, in the newspapers and marriage records, three or more calendars were used. The Ottoman government only accepted this situation as a reform. The abolition of the *Hicri* calendar from the official level was a kind of secularization. Although the *Hicri* calendar was maintained by the social level, it removed from the official level.

In the Republican period, the Gregorian calendar was adapted in 1926. This was and is regarded as a revolution any development. This argument contains some truth; however, this reform altered only the numbering of the year which became suitable to the universal level. With this reform, the *Rumi* calendar was abolished and the *Hicri* calendar was maintained to determine the special religious times. The new system removed the dichotomy.

We can analyze the idea of the founders of the Republic by assessing the calendar reform. After the French Revolution, the Revolutionaries introduced a new calendar that was started from the Revolution. They also tried to remove the religious effects on the calendar. This calendar did not succeed. The ordinary people kept using their folk calendar and their religious calendar. After the foundation of the Turkish Republic, the Kemalists did not feel the need to produce a calendar that was based on the roots of the new regime. Berkes writes that, "to reach the stage achieved by the civilized nations! That became the motif of the new ideology. The reforms to be undertaken would imply nothing but a total revolution-the appropriation of Western civilization... Wherever Mustafa Kemal toured he emphasized the idea, "the war is

over with us victorious, but our real struggle for independence is to begin only now- this is the struggle to achieve Western civilization."[342]

He presented a speech by Mustafa Kemal as an example that

> Surviving in the world of modern civilization depends upon changing ourselves. This is the law of any progress in the social, economic and scientific spheres of life. Changing the rules of life in accordance with the times is an absolute necessity. In an age when inventions and the wonders of science are bringing change after change in the conditions of life, nations cannot maintain their existence by age-old rotten mentalities and by tradition-worshipping... Superstitions and nonsense have to be thrown out of our heads.[343]

The calendar is evaluated as a dimension of civilization. This approach can be seen in other states that proclaimed of independence in this period, such as China and Albania.

Ahmet Ağaoğlu writing on civilization, said that

> Every civilization... constitutes a whole. The superiority of a civilization lies in its totality and not in its discrete parts. A civilization can not be fragmentized or sifted. If modern techniques and sciences have developed in Western civilization and not in others, in invites us to realize that there were congenial conditions for this in the totality of that civilization. If Western civilization is victorious over other civilizations, it is not only because of its techniques or sciences, but because of its totality, because of all of its constituent elements, because of all of its virtues and vices. And the totality of Western civilization has defeated not only the particles, but again the totality of Oriental civilizations... the interference of religion in everything in life has caused the decline of Islam, while the secularization of the West has brought the superiority of its civilization. "There are now two roads for us to follow: to accept defeat and annihilation or to accept the same principles which have created contemporary Western civilization." If we want to survive, we have to secularize our view of religion, morality, social relations and law. "This is possible only by accepting openly and unconditionally the mind as well as the behavior of the civilization which we are bound to imitate.[344]

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[342] Niyazi Berkes. *The Development of Secularism in Turkey* (London: Hurst&Company, 1998), pp. 463-4.
[343] Gazi Mustafa Kemal Paşa. *İzmir Yollarında* (Ankara, 1923), pp. 22 quoted by Berkes, p. 464.
[344] Ahmet Ağaoğlu. *Üç Medeniyet* (Ankara: 1928) quoted by Berkes; pp. 464-5.

He perceived the calendar as a part of Western civilization. Also he asserted the Western civilization should be taken with all dimensions because it was undivided.

Ismail Hakkı Baltacıoğlu defined civilization in his book *Batıya Doğru* (Towards the West). He explained the difference between technology and civilization and he claimed that the Turks took the Western technology, but not the Western cultures, which had brought about their way of living.[345] He also said technology produced humanity; therefore it is international, not related with the West.[346]

Peyami Safa divided the "*inkılap hareketleri*" (movements of revolution) into two main parts: the first one was "*milliyetçilikten doğma inkılap hareketleri*" (the revolution movements born from the nationalism) and the other one was "*medeniyetçilikten doğma inkılap hareketleri*" (the revolution movements born from civilization). He also claimed that the calendar was part of the revolution movements born from civilization.[347]

The views of Baltacıoğlu and Safa contain some conservatism in criticizing the concept of civilization. They declared that Turkey could take the western technology, but should not take its culture. If their culture concept contained the way of living, we can perceive in the Ottoman experience of the time issue that the train came with its time standards and altered the time conception and the way of living. In contrast to Baltacıoğlu and Safa, Ağaoğlu perceived a civilization conception which did not contain contradiction.

The *muvakkikhanes* were an important part of Ottoman society. Before the modernization period, the *muvakkits* determined the time and informed the *imams*; they announced the prayer times to the people from the mosques. The relationship between the *muvakkits* and the Muslim people was significant because the prayer

[345] İsmail Hakkı Baltacıoğlu. *Batıya Doğru* (İstanbul: Sebat Basımevi, 1945), pp. 11-5.
[346] Ibid., p.13.
[347] Peyami Safa. *Türk İnkılabına Bakışlar* (İstanbul: Ötüken Yayınları, 1999), pp. 98-102.

times were important in daily worships. The Muslims did not need a clock to determine the time; they regulated their days by the calls to prayer. It can be said, therefore, that the personal mechanical clock was not important to determine the time. This explains why the Ottomans did not produce a personal clock. Ottoman clockmakers produced only great clocks to put in mosques, *muvakkithanes*, and houses.

The interesting thing is that most of the Muslim clockmakers were *mevlevi*, they produced clocks to determine the time given by Allah. This was similar to the European time determiners who were clerics. Moreover, the Muslim clockmakers produced their clocks as works of art. They did not try to develop their production techniques, as their European counterparts did in period. The Ottoman clockmakers did not compete with the Europeans because the latter manufactured their clocks in factories and produced them at less cost.

Determining time in the *muvakkithane* was a sacred and natural task. With the coming of the mechanical clock, the tools they used change, not their working principles. After the development of new time system, the real destruction of old time structures began. In the Ottoman Empire, the time was announced from the mosques. This was communication by sound. Also people could follow the time with natural indications. After the changing of the time system, the time began to understand with by sight. Moreover, the new conception of time could follow with mental relationships that were not related to natural events.

The building of clock towers in the Ottoman period can be analyzed as a part of the secularization process as in Europe in the thirteenth century. Most of the clock towers built throughout the Empire were constructed to commemorate the twentieth and thirtieth anniversaries of the ascent to the throne of Abdulhamid II. The clock

towers affected their environment, offering an alternative places to mosques. They had their own time and marked the new city center. Furthermore, the government tried to inculcate time disciplines and time consciousness both to officials and the people. In that period, most of the official buildings were constructed with a mechanical clock on the facade.

The clock towers were built as a city decoration in the period of Adülhamid II. Most of them were built by philanthropist and as a competition between cities. The main aim of the construction of a clock tower was to teach the time discipline to the ordinary people with this mechanical clock. For example, most clock towers were built in the cities that were did not have train station. Probably, the new time conception did not became widespread throughout the Empire with the train. The clock towers' purpose was to spread the new time conception.

Some intellectual discussions in that period were related to time discipline.[348] Some compared the Ottoman time discipline with that of the western people's time discipline and their mentality about work with that of the Ottoman people. Some claimed that if the Ottomans wanted to reach the level of Western civilization, they should change their time disciplines.

The impact of changing the hour system was greater that that of changing the calendar system, according to the ordinary people. The hour system determined daily life and the way of living. The alteration of the hour system began in the late Ottoman era. The train changed the time system and the trade with foreign countries supported this alteration.

The dichotomy of the time can be seen in the hour system because it affected daily life. It also caused some integration problems in society. After the Balkan Wars,

[348] For more information, look at the action on the views of Ahmet Mithat Efendi and Ahmet Samim the former chapter.

the *alafranga* hour system became widespread at the official level. In spite of this development, the alteration of the hour system officially was achieved in the Republican era. This was a real revolution, which eradicated the dichotomy in time.

In the *alaturka* hour system, workers could be worked sixteen hours a day, from sunrise to sunset in summer. Most of the workers went on strike to protest such working conditions. The new system gave order to working life.[349] Moreover, Ottoman workers worked longer days than foreign workers in a day and earned less money.[350] The dichotomy of hour system caused social inequality in working life. It is interesting that the hour system was changed after the Balkan Wars on the social level and it was abolished in the Republican era; it was not altered with social pressure.

The changing of the hour system supported the secularization of daily life more than the calendar reform because the *Hicri* calendar could be followed and a person could put his/her life in order according to religious days. However, the alteration of the hour system changed the religious daily life practice. The day was divided into different sections, therefore, most of the rural area people continued to set their clocks according to *ezani* hours in practice.[351] The government ordered only the lives of officials and students. Government offices adapted their time conception to the government standards.

The holiday conception was fitted to lives of the ordinary people's lives. In the Ottoman era, there was no concept of a day off from work. After the modernization, some establishments began to be closed one day a week and this practice was ordered with the Republic. The holiday conception was extended to every level to include

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[349] Mesut Gülmez. "Tanzimat'tan Sonra İşçi Örgütlenmesi ve Çalışma Koşulları (1839-1919)," p. 794.
[350] Ibid., p.794.
[351] For example, my granfather has set his clock according to *ezani* hours since 1940s. Today, some merchants open their shops from sunrise and close to sunset in rural areas; such as Mersin.

religious holidays, national holidays, and the New Year holiday. Traditionally, for example, in the Ramadan Festival, people kept working; there was no modern holiday conception. With the Republican era, Muslims began to think that the days of religious festival should be holidays. Apart from this, the national holiday became the symbol of the Republic, and it developed the secular phenomenon in Turkish society.

The alteration of time conception changed the *adab-ı muaşeret* (the rules of good manners). In the old times a guest was perceived as the *tanrı misafiri* (unexpected overnight guest). After the modernization of the time, guests were received only at specific hours.[352] The schedule in daily life began with daily practice; the new time system began to develop its own social rules. The time system shows its modernizing effects on the principles of *adab-ı muaşeret.*

Time conception and its transition period mark an interesting breaking point in the social life from the Empire to the Republican era. Time, sometimes, was realized as a secularization element in society by the power. As mentioned above, the symbology of time and its social meaning was change according to society, which had a different religion or world view. With modernization, time became the common phenomenon on both the social and political levels throughout the world.

One dimension of the globalization of the world was time and it was achieved with the producing common time standards. In conclusion, the aim of thesis is to describe the alteration of the time and its process from the Empire to the Republic. These data can supply more valuable information about Turkish social codes and behaviors in regards to the modernization and secularization movements.

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[352] Nevin Meriç. *Osmanlı'da Gündelik Hayatın Değişimi -adab-ı muaşeret 1894-1927-* (İstanbul: Kaknüs Yayınları, 2000), p. 125.

APPENDIX

The *Hicri* Calendar

The lunar calendar has been used by religions since the early years of Judaism. It has been used to determine religious days and months such as religious festivals and fast days, like *Ramazan* in Islam, Passover in Christianity, and feast days.

The Muslim era is computed from the starting point of the year of the emigration (Hegira); that is, from the year in which Muhammad, the prophet of Islam, migrated from Mecca to Medina, 622 AD. The second caliph, Ömer who, reigned from 634-644, set the first day of the month Muharram as the beginning of the year; that is, July 16, 622, which had already been fixed by the Koran as the first day of the year.

The years of the Muslim calendar are lunar and always consist of twelve lunar months, alternately thirty and twenty-nine days long, beginning with the approximate New Moon. The year has 354 days, but the last month (*Zil hicce*) sometimes has an intercalated day, bringing it up to thirty days and making a total of 355 days for that year. The months do not keep to the same seasons in relation to the sun, because there are no intercalations of months. The months regress through all the seasons every 32 ½ years.[353]

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[353] *The New Encyclopedia Britannica*, V.3, "Calendar", p.600.

The names of the months and the number of days in each are *Muharrem* (30), *Sefer* (29), *Rebi'ül evvel* (30), *Rebi'ül ahir* (29), *Cemaz'ül evvel* (30), *Cemaz'ül ahir* (29), *Receb* (30), *Şaban* (29), *Ramazan* (30), *Şevval* (29), *Zil kade* (30), and *Zil hicce* (29).

Ramadan, the ninth month, is observed throughout the Muslim world as a month of fasting. According to the Koran, Muslims must see the new moon with the naked eye before they can begin their fast. The practice arose that two witnesses should testify to this before a *qadi* (judge), who, if satisfied, communicated the news to the *müftü* (the interpreter of Muslim law), who then ordered the beginning of the fast. It has become usual for Middle Eastern Arab countries to accept, with reservations, the verdict of Cairo. Should the New Moon prove to be invisible, then the month *Şaban*, immediately preceding *Ramazan*, is reckoned as thirty days in length, and the fast begins on the day following the last day of this month. The end of the fast follows the same procedure.[354]

The Julian Calendar

In the mid-1st century BC, Julius Caesar invited Sosigenes, an Alexandrian astronomer, to advise him about the reform of the calendar, and Sosigenes decided that the only practical step was to abandon the lunar calendar altogether. In the Julian calendar, months are arranged on a seasonal basis, and a tropical (solar) year are used, as in the Egyptian calendar, but with its length taken as 365 1/4 days, a value more accurate than the Egyptians 365. It was decided that the

[354] Ibid., p.600.

vernal equinox would fall on March 25; to achieve this, eighty-five days were added to the year forty-six.[355]

To remove the immense discrepancy between calendar date and equinox, it was decided that the year known in modern times as 46 B.C. should have two intercalations. The first was the customary intercalation of the Roman Republican calendar due that year, with the insertion of twenty-three days following February 23. The second intercalation, to bring the calendar in step with the equinoxes, was achieved by inserting two additional months between the end of November and the beginning of December. This insertion amounted to an addition of sixty-seven days, making a total intercalation for the year of ninety days, and causing the beginning of March, 45 B.C. in the Roman Republican calendar, to fall on what is still called January 1 of the Julian calendar.[356]

Previous errors having been corrected, the next step was to prevent their recurrence. Here Sosigenes recommendation of about a tropical year was adopted and any pretence to a lunar calendar rejected. The figure of 365.25 days was accepted for the tropical year, and to achieve this by a simple civil reckoning, Caesar directed that a calendar year of 365 days be adopted and that an extra day be intercalated between February 23 and 24 every fourth year. Since February ordinarily had 28 days, February 23 was the sixth day before the Kalendae, or beginning of March, and known as the *sexto-kalendae;* the intercalary day, when it appeared, came the day after, and was therefore called the *bis-sexto-kalendae.* This practice led to the term *bissextile* being used to refer to such a leap year. The term "leap year" was a later development, probably derived from the Old Norse *hlaupa* (to leap) and used because, in a bissextile year, any fixed festival after

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[355] *The Encyclopedia Americana, International Edition.* (New York: 1968), V.5, p.184.
[356] *The New Encyclopedia Britannica,* (New York: 1979), V.3, p.601.

February leaps forward, falling on the next weekday but on to that of the previous year, not on the next Weekday as it would do in an ordinary year.

The Alexander Calendar

After the death of Alexander the Great, a state was established in Mesopotamia by *Selefkos.* Afterward, these people, who were Christians, lived in Syria under the Ottoman Empire. They were called the *Süryani,* and were Syrian Orthodox. They used a calendar and in the Ottoman *Müneccimbaşı* calendar contained 400 years. The *Müneccimbaşı* calendars called this calendar the *İskender* (Alexander), or Rumi calendar.

The *Kıpti* (Coptic) Calendar

The Coptic's are descendants of ancient Egypt. When the Roman Emperor Diocletianus ascended the throne in 284, the Coptic calendar came into use throughout the Eastern Roman Empire. Each year begins on 29/30 August and has twelve months of thirty days. Each three years, five days are added to the twelfth month; and in the fourth year, six days are added to twelfth month. The names of Coptic calendar months spring from ancient Egypt month names, such as *Tut and Babeh.* Added days are called *Nesi* (adding days to the year) days.[357]

Ahmet Cevdet Paşa in *Takvim ül Edvar*, explains that after 284 BC and the dating of *Selefkos* (Alexander the Great) 595 years, when the Egyptians revolted against the Roman Empire, the Roman Emperor Diocletian began to repress them,

[357] A. Necati Akgür, "Eski Mısır Takvimi ile bundan alınan Kıpti Takvimi -Eski Fars ya da Yezdicürd Takvimi-, *Türk Dünyası Araştırmaları*, No.74, (Ekim, 1991), p.173.

this calendar was constituted by him. This calendar is called the Coptic Calendar. Its New Year s Day is twelve degrees of Virgo.[358]

Ahmet Sakir Paşa, in *Takvim-i Nücumi*, reported that the dating of the Coptic Calendar began on Wednesday, 26 February, 747. Afterwards, *Buhtunnasır* dating was based on this calendar system. In 25 BC, this calendar was adapted to the Roman calendar by the Egyptians and every fourth year proclaimed a leap year. Later, they began to use the Diocletian calendar, which starts its dating on Friday 29 August, 284.[359]

The *Halk* (Folk) Calendar

In the Ottoman Empire, the people used the *Halk* or Folk calendar to mark the seasons and weather. This calendar is a legacy from ancient Greece. The year is divided into two main parts the *Hıdırellez* (festival held on May sixth to celebrate the coming of summer) and the *Kasım* (November) to six months later on to 8 November. In every agricultural society, calendars determine their daily work.

Ulug Bey *zic* offers information about the *Halk* calendar. In the early period, there is little data about *Halk* calendar in the *Müneccimbaşı* calendar, later the data increases.[360]

The significant days in the Folk calendar are *Hıdırellez, Riyah-i Bevarih, Ruz-u Yelda* (the longest day in Persian), *Bad-i Semum* (the simoom), *Eyyami Bahur* (the suffocating hot weather in the summer), *Şeb-i Yelda* (the longest night

[358] Ahmet Cevdet Paşa, *Takvim ül Edvar* (Konstantiniyye: Hicri 1287), p.27.
[359] Ahmet Şakir Paşa, *Takvim-i Nucumi* (Konstantiniyye: Matbaa-ı Ebuzziya, Hicri 1306), pp.57-59.
[360] A. Necati Akgür, "Halk Takvimi", *Türk Dünyası Araştırmaları*, no.86 (Ekim, 1993), p.124.; A. Necati Akgür, "Rumi ve Miladi Takvimler-VII", *Toplumsal Tarih*, no.65, (Mayıs, 1999), pp.54-55.

in the year), *Erbain and Hamsin, Cemreler* (any of three radiations of heat which supposedly fall in succession from the sun into the air, the water, and the earth in February and March), *Berd el-Acuz* (a cold spell in mid-March), *Nevruz* (a new day or the New Year s Day in Persian), *Sitte-i Sevr* (*Boga altılısı*).[361]

The main characteristic of the Folk calendar was that these important days were known by the people who were illiterate. They determined the date and their work throughout the year according to it.

The *Celali* Calendar

In the Seljuk Empire, in the reign of Melikşah, the *Celali* calendar was created by a group of astronomer in which one of the members is known to have been Ömer Hayyam.

The *Celali* calendar began with the vernal equinox in the year 1079 (*Hicri* 471). The *Celali* year was made the strictly astronomical tropic year, according to the measure fixed by the observation then hold to be the most correct one.[362] Because the *Celali* year was tropical and began on the vernal equinox, the commencement of the year was determined every year by calculation. The astronomical beginning was always the exact point of time when the sun (in reality the earth) reached the equinoctial point of the ecliptic, which in astronomy is called conventionally "the first point of Aries". The New Year s Day, however, was always the day on which the equinox occurred. It follows that each time the equinox when happened after noon, that day was a leap day and the year just coming to a close a lap year (of 366 days). Therefore no rule for the periodical

[361] Akgür; "Halk Takvimi", pp.135-142; "Rumi ve Miladi Takvimler-VII", pp.55-57.
[362] S.H.Taqizadeh, "Various Eras and Calendars Used in the Countries of Islam", *Bulletin of the School of Oriental Studies*, No.10, (1939), p.110.

readjustment of the year by the intercalation of a supplementary day was necessary nor was it provided.[363]

Akgür says on the *Celali* calendar that "the *Celali* calendar, which has 128 years alternately is always suitable to the seasons and it comes from a straightened Julian/Rumi calendar; that is, this reform, which occurred before 503 years before the Gregorian reform, caused the first sun calendar suitable to the seasons."[364]

The Ottoman writers defined and described the *Celali* calendar in their books. Ahmet Cevdet Paşa writes, in *Takvim ül-Edvar,* that "the *Celali* calendar was formed to be suitable for astronomical techniques. So, it is a more correct calendar than the calendars that were used in other countries in history."[365] Ahmet Muhtar Paşa says in *Islah ut-Takvim* that "the *Celali* calendar has the most suitable residual method used in history. In this calendar, the New Year's Day does not change and is suitable to the seasons."[366] Ahmet Şakir Paşa in *Sene-i Maliye Hakkında Mutaleat*, wrote that "the *Celali* calendar is suitable for the nature of things and the movements of celestial bodies."[367]

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[363] Ibid., p.113.
[364] A. Necati Akgür, "Rumi ve Miladi Takvimler-X", *Toplumsal Tarih*, No.68, (Ağustos, 1999) p p.52-53. Also, for more information look at "Rumi ve Miladi Takvimler-VIII", *Toplumsal Tarih*, no.66 (Haziran, 1999), pp.57-61.; "Rumi ve Miladi Takvimler-IX", *Toplumsal Tarih*, No.67, (Temmuz, 1999), pp.49-55.
[365] Ahmet Cevdet Paşa, *Takvim ül-Edvar*, p.42..
[366] Ahmet Muhtar Paşa, *Islah ut-Takvim* (Mısır, Hicri 1307), pp.39-40.
[367] Ahmet Şakir Paşa, *Sene-i Maliye Hakkında Mutaleat* (Konstantiniyye: Matbaa-ı Ebuzziya, Hicri 1308), p.15.

The Gregorian (*Miladi*) Calendars

In 1582 Pope Gregory XIII declared a reform of the Julian calendar. By the Julian reckoning, the solar year comprised 365¼ days; the intercalation of a "leap day" every four years was intended to maintain correspondence between the calendar and the seasons. A slight inaccuracy in the measurement (the solar year comprising more precisely 365 days, 5 hours, 48 minutes, 46 seconds) caused the calendar dates of the seasons to regress almost one day per century.[368]

The Gregorian calendar differs from the Julian only in that no century year is a leap year unless it is exactly divisible by 400 (e.g., 1600, 2000). A further refinement, the designation of years evenly divisible by 4,000 as common (not leap) years, will keep the Gregorian calendar accurate to within one day in 20,000 years.[369]

The papal bull appeared in February 1582 announcing the adoption of the calendar. First, in order to bring the vernal equinox back to March 21, the day following the Feast of St. Francis (that is, October 5) was to become October 15, thus omitting ten days. Second, to bring the year closer to the true tropical year, a value of 365.2422 days was accepted. This value differed by 0.0078 days per year from the Julian calendar reckoning, amounting to 0.78 days per century, or 3.12 days every 400 years. It was therefore promulgated that three out of every four centennial years should be common years, that is, not leap years; and this practice led to the rule that no centennial years should be leap years unless exactly divisible by 400. Thus, 1700, 1800 and 1900 were not leap years, as they would

[368] *The New Encyclopedia Britannica*, Vol.5, p. 476.
[369] Ibid., p. 476.

have been in the Julian calendar, but the year 2000 was. The bull also laid down rules for calculating the date of Easter.[370]

The Improvements of Mechanical Clocks in Europe

People have used the sun and the moon to determine time since the first human. Although time measurement tools have changed related to technological developments, these tools have been clocks. The oldest clocks are of gnomon. Later, different types of gnomons were developed to meet new needs. In the night, they used water clocks, or fire clocks to determine time. After the invention of the mechanical clock, most of which worked with water, clockmakers began to develop new techniques. However, these clocks did not show accurate time until the seventeenth century.

The first clock tower which gave the time to all who could see or hear its bells was built in Westminster, England in 1288. In 1292, mechanical clocks were installed in Canterbury Cathedral.[371] These were large iron-framed structures, driven by weights. The function of these first European mechanical clocks was not to indicate the time on a dial, but to drive dials that gave astronomical indications, and to sound the hour. They were located in monasteries and public bell towers.[372] The first public striking clock was erected in Milan, Italy in 1335.[373] The oldest surviving clock in England is that at Salisbury Cathedral, which dates from 1386. A clock was erected at Rouen, France in 1389.[374]

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[370] *The New Encyclopedia Britannica*, "Calendar", Vol.3, p. 602.
[371] *Encyclopedia International*, Vol.4 (USA: 1963), p.502.
[372] *The Encyclopedia Americana*, Vol. 7, p. 89.
[373] *The New Encyclopedia Britannica*, "Clock," Vol. 3, p. 392 and "Clocks Watches and Sundials", Vol. 4, p. 744.
[374] Ibid., Vol. 3, p. 392.

According to contemporary manuscripts, Richard of Wallingford made an elaborate clock with many astronomical indications for St. Alban's Abbey in England in 1330. An equally elaborate clock was made by Giovanni Dondi in Italy. He completed it in 1364, and it survived for nearly two hundred years.[375]

Domestic clocks were scaled-down versions of the public clocks, but without the astronomical indications. They were regulated easily by varying the driving weight. The earliest extant illustration of such a clock is in an illuminated manuscript of 1406 in the National Library France in Paris.[376]

From the mid-fourteenth century, the mechanism of weight-driven clocks underwent surprisingly little alteration in principle, but the construction of both the mechanism and the case became much more refined.[377] Springs were first used instead of weights for the driving power of clocks in the second half of the fifteenth century. They had the disadvantage that their drive was not constant; the pull, or torque was greater when the spring was fully wound than when it was nearly unwound.[378]

About 1500 Peter Henlein, a German locksmith, began to make small clocks driven by a spring. These were the first portable timepieces, representing one of the great strides in horology; from this period to the end of the century, progress was rapid. The deals of this clocks, placed at the top, and the possessing an hour hand only (minute hands did not appear until 1670), was exposed to the air; there was no form of cover, such as a glass, until the first quarter of the seventh century.

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[375] *The Encyclopedia Americana*, Vol. 7, p. 89.
[376] Ibid., Vol. 7, p. 89.
[377] Ibid., Vol. 7, p. 89.
[378] Ibid., Vol. 7, pp. 89-90.

From the end of the sixteenth century, clocks were made in the upright, but still with the balance as controller. They were similar to the domestic weight-driven clocks described above, but were not portable. During the early part of the seventh century, the mechanism was enclosed; the cases were made of brass and a new style emerged called the lantern clock.[379]

Great accuracy in time measurement was first made possible when the pendulum was introduced as a regulator in clocks.[380] Galileo, in 1582, noticed that, as timed by his pulse, a swinging lamp in the cathedral of Pisa seemed to have the same length of swing for large as well as small arcs. This observation was used in reserve by physicians, who timed their patients' pulses small pendulums, or "pulsilogium". Toward the end of his life, Galileo attempted to apply the pendulum to clocks as a timekeeping element. However, he died in 1642, before the clock was constructed.

Christian Huygens, working independently in Holland, completed a preliminary model of a pendulum clock in 1656. In the following year, his clockmaker, Salomon da Coster, began making with a spring-driven pendulum in The Hague. Two of these have survived to this day. The escapement was the same, but the pendulum, with its characteristic period, replaced the foliot balance or balance wheel. The employment of pendulums improved the timekeeping of clocks so much they were incorporated in all new clocks incorporated them; many older clocks were reworked to employ one.[381]

Huygens' invention brought about a great increase in the importance and extent of clock making. Clocks, weight driven, with short pendulums, were encased in wood and made to hang on the wall. In 1670 the long, or seconds,

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[379] *The New Encyclopedia Britannica*, Vol. 7, p. 744.
[380] *The Encyclopedia Americana*, Vol. 7, p. 90.
[381] Ibid., p. 90.

pendulum was introduced by William Clement, an English clockmaker. The next step was to enclose the pendulum and weights, and the long case, or grand farther clock, was born.[382] The great virtue of the pendulum as a time measurer lies in the fact that, for small arcs, the time required for a complete swing (period) depends only on the length of the pendulum and is almost independent of the extent of arc.[383]

The escapement of a pendulum clock usually consists of two parts: an escape wheel of special shape geared the clock's main train of wheels, and an oscillating system linked with the pendulum and carrying two projections or pallets that engage alternately with the teeth of the escape wheel.[384]

More accurate clocks were made possible by the deadbeat escapement, introduced by George Graham in England in about 1715. With the deadbeat escapement, the pendulum received an impulse near the center of its swing and was subject to only slight friction for the rest of its swing. A good pendulum clock with a deadbeat escapement is accurate to a few seconds per day. Graham devised his cylinder escapement in about 1720. It had properties similar to the deadbeat for pendulum clock.[385]

This was later superseded by Thomas Mudge's "detached lever" escapement, in which the balance wheel receives an impulse at the center of remains swing and it's entirely free of outside interference for the rest of its swing. It was invented in 1765, but was not in general use until much later. Since

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[382] *The New Encyclopedia Britannica*, Vol. 7, p. 744.
[383] *The New Encyclopedia Britannica*, Vol. 7, p.744.
[384] Ibid., p. 745.
[385] *The Encyclopedia Americana*, Vol. 7, p. 92.

about the mid-nineteenth century, this type of mechanism has been almost universally employed in small clock and watches.[386]

In the nineteenth century, a number of inventors designed escapements in which weighted arms were raised by the escape wheel and than delivered the impulse of the pendulum as they descended to their original position. The first really successful escapement of this kind was invented in 1853 by J.M. Bloxam, a barrister. A much better from, the double three-legged gravity escapement, was invented by Elmund Beckett, later known as Lord Grimthorpe (1816-1905), and used by him for the great clock at Westminster, now generally known as Big Ben, which was installed in 1859. It has since become the standard for all accurate tower clocks.

In the mechanism of the modern clock, the wheelwork or train of the clock is the series of moving machine parts (gears) that transmit motion from a weight or spring to the minute and hour hands. With all but the gravity escapement, it is most important that the energy transmitted by the wheelwork be as constant as possible.[387]

The material from which a clock made is crucial for temperature compensation. a pendulum rod expands or contracts with a rise or fall in temperature according to the material of which it is made. This change of length alters the time of swing. A brass rod for example will produce a losing rate of five seconds per a day for a temperature rise of 10 F (5.5 C).

The problem of temperature source needed was finally solved in 1895 by the French Charles Guillaume, who produced a nickel-steel alloy called invar. Rods of invar effectively remain the same length over a wide temperature range.

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[386] Ibid., p. 90.
[387] *The New Encyclopedia Britannica*, Vol. 7, p. 745.

Methods used to compensate timekeepers controlled by a balance and spring involve the use of two metals fused together for the balance wheel, moving weights inwards or outwards to compensate for the change in stiffness of the balance spring with temperature.[388]

[388] *The Encyclopedia Americana*, Vol. 7, p. 90.

تاريخ عربى دينلان هجرئ قمرى بيك ايكيوز اللى التى سنه‌سندن برو بلاانقطاع دوام ايده‌كلن مالى سنه تاريخنك تنظيم و اصلاحنه دائر نظامنامه‌در

ماده

١ اصلاً رومانك معدل زوليهن تاريخى اولوب امور ماليه و زراعيه‌ز عاميه و تاريخيه‌ده اليوم استعمال ايتديكمز تاريخ مالى هجرت سنهٔ جناب پيغمبرى سنه‌سندن بدأ ايتمك اوزره هجرى سنهٔ شمسيه تاريخيله تبديل ايديله‌جكدر .

٢ اشبو هجرئ شمسى تاريخنك ترجيحى سنه‌سنك ايلك كونى هجرت سنه‌سنك تصادف ايتديكى ٦٢٢ تاريخ ميلاديسنك سنه باشيسى اولان كانون ثانينك برنجى كونندن عد و اعتبار ايديله‌جكدر بناءً بعدما هر سنه شمسيه‌لر مصحح غربى تاريخ ميلاديسنك سنه باشندن باشلايه‌جق و اصول كبيسه‌يده آكا تابع اوله‌جقدر .

٣ تاريخ هجرئ شمسينك اسامئ شهور و اعداد ايامى سنهٔ ماليه‌نك آى و كونلرينك عينى اوله‌رق دوام ايده‌جكى جهتله تاريخ ميلادى ايله تاريخ شمسيمز آره‌سنده‌كى ٦٢١ فصل رقمى هركون ايچون الى الابد لايتغير قاله‌جغندن هر نه وقت ايستنيلور ايسه اك سنهٔ شمسيه‌يه ضم ويا ميلاديدن طرحيله تاريخين قولايجه يكديكرينه تحويل اولنه‌بيلمك سهولتى حائز اوله‌جقدر .

٤ اليوم جارى اولان بيك اوچيوز يكرمى سكز سنهٔ ماليه‌سنك مقابلى بيك ايكى يوز طقسان بر سنهٔ شمسيه‌سى اولمسنه نظراً آره‌ده‌كى ارقام سنين آنجاق بر كره دها كچه‌جكى جهتله بونلردن هر برينك ديكرينه التباسنى منع ايچون بعدما مطبوع اوراق اوزرنده‌كى تاريخلك ياننه سنهٔ شمسيه ايچون «ش» ماليه ايچون «م» قمريه ايچون «ع» حرفلرى يازيله‌جقدر .

٥ تبديلى تقرر ايدن اشبو سنهٔ ماليه‌نك مبدئى اولان ٩ محرم ١٢٥٦ جمعه كونه تصادف ايدن ١٨٤٠ طرز جديد ميلادى مارتنك اون اوچندن بدأ ايله بوم تبديله دكين مالى و هجرئ شمسى و قمرى سنه‌لردن هر برينك ديكرنده مقابل ايامنى كوستره‌جك مخصوص اوچ ستونلى بر تحويل جدولنك ترتيب و طبعيله تسهيل معاملات ايديله‌جكدر .

٦ هجرت سنيهٔ حساب رسالتپناهى سنه‌سندن بدأ ايله اليوم امور دينيه و معاملات رسميه‌ده مستعمل هجرى سنهٔ قمريه تاريخى دخى بالاده كوستريلان هجرئ شمسى تاريخيله معاً موقع استعمالده دوام ايده‌جكدر .

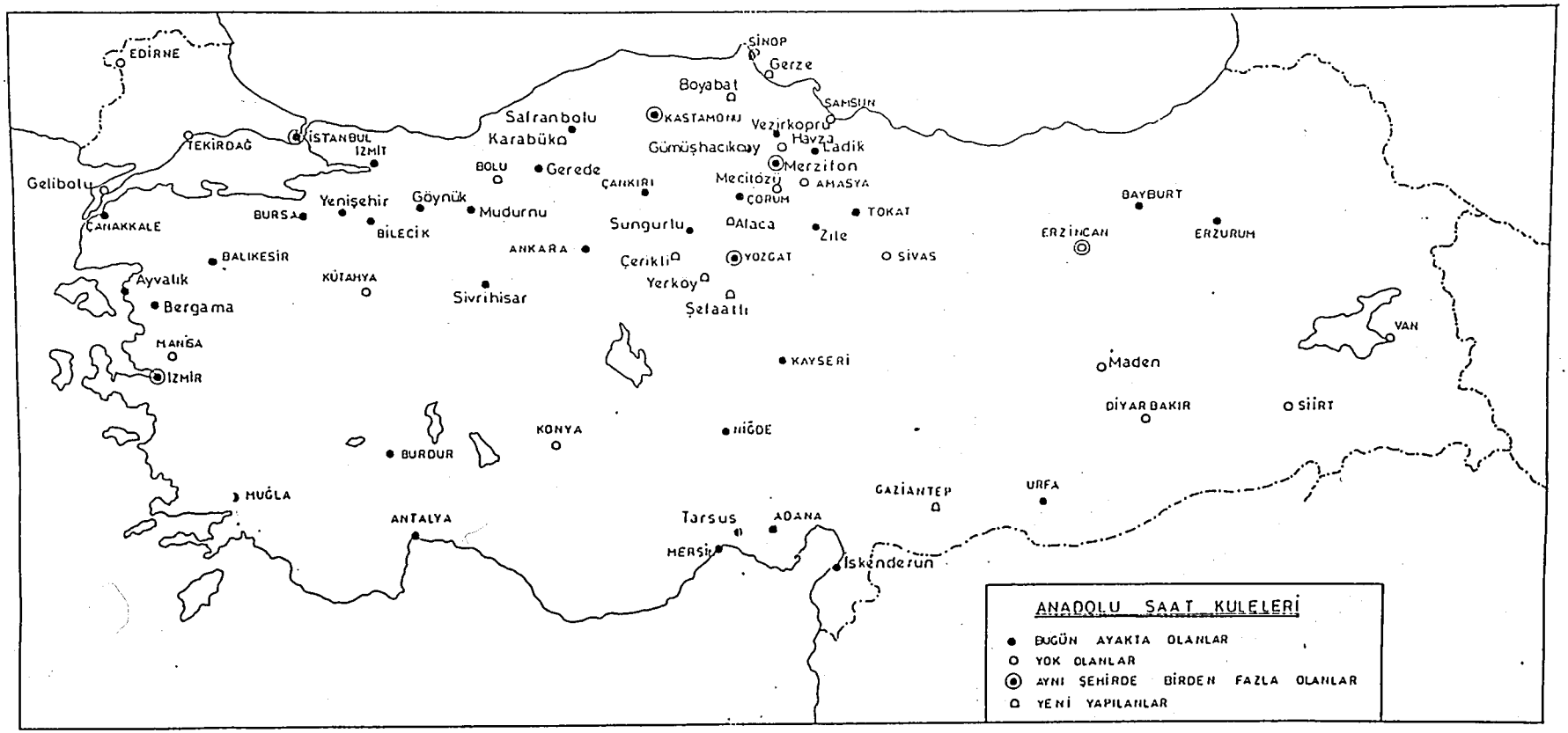
مطبعهٔ عامره

Ahmed Muhtar Paşa'nın «Mâli sene tarihinin tanzim ve islâhına dâir» hazırladığı nizamnâme metnidir. Başında 2 sahifelik gerekçe (mazbatası) vardır.

يكى سنه يه كيرركن

سال گذشته نك محاسبهٔ اعمالنه بر نظر

كنج جمهوريتمز يكى سنه يه محاسبهٔ اعمالنك مطلوب وقازانج خانه سنده بويوك يكونلرى اولديغى حالده استقبلدن وموفقيتدن ايين اولارق آچيق آلنله وديها بويوك بر عزم وايمان ايله كيرمكدهدر


EDİRNE
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İSTANBUL
İZMİT
Gümüşhacıköy
Merzifon
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ANTALYA
Tarsus
ADANA
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İskenderun
ANADOLU SAAT KULELERİ
BUGÜN AYAKTA OLANLAR
YOK OLANLAR
AYNI ŞEHİRDE BİRDEN FAZLA OLANLAR
YENİ YAPILANLAR

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