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TOPKAPI'S TURKISH TIMEPIECES

by James Horgen

Figure 1. Entrance to Topkapi Palace called Bab-us-Selam (Gate of Salutation).

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In 1923, when the last of the Ottoman Sultans left Istanbul for exile and the new Republican regime decreed that the dynasty's sumptuous palaces along the Bosporus should become museums, officials undertook a housecleaning that uncovered rooms and closets stuffed with collections of art and royal paraphernalia, much of it long-forgotten gifts from emperors, kings, and dignitaries who had once sought the favor of the mighty Ottoman court.

In the vast Topkapi Palace, they discovered a little-known legacy of Turkey's Ottoman past. Sorting through a collection of more than 100 splendid clocks and watches, most in perfect condition, they found among such gifts from Europe as nineteenth century English and French floor clocks, a small collection of timepieces, dating from the sixteenth century, which bore craftsmen's names inscribed in Ottoman script. These were clocks and watches which had been made in the Ottoman empire, and in both the technical precision of their works and the lavish embellishment of their cases they were stunning examples of the clockmaker's art.

The Ottomans are usually thought of as soldiers rather than technicians, and even much of the "Ottoman" art and architecture created during their 400-year reign was the work of various urban minority groups, who themselves borrowed heavily from the legacy of Byzantium. How did it happen, then, that Ottoman craftsmen turned to the intricate and demanding art of clockmaking?

Religion was probably the main reason. As Muslims, Turks were obliged to pray five times daily, and since the time of the Prophet in the seventh century, Islamic religious leaders had been concerned with devising ways of determining these prayer times. Since timepieces were unknown in Arabia during the Prophet's lifetime, the desert Arabs worked out a rough method of determining prayer times by observing the varying phases of the sun. The first prayer, they decided, should be performed when a man could "discern his neighbor on the horizon," the second at noontime "when the sun was just beginning to decline," the third in mid-afternoon, the fourth in the evening "when one could still perceive the place his arrows fell," and the fifth "after some of the night had passed." Since the muezzin of each mosque decided whether he could "see his arrows" or not, prayer times were often irregular.

This method was used with slight changes until the Muslim armies moved out of the Arabian Peninsula into Palestine and Syria, where they first came into contact with sundials and waterclocks. Sundials, known since Greek times, were frequently used in conjunction with a simple waterclock, a bowl with rings marked around the inside that were revealed as water flowed out of the bowl at a steady rate through a hole in its bot-

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Figure 2. Ornate standing clock in the Harem chambers.

Figure 3. Gilt and tortoise-shell clock.

tom. As the "day" was reckoned from sunset (*Aramco World,* March–April 1969), the hours indicating midday and midnight continually varied with the seasons, and to remedy this, Muslim scholars devised almanacs to determine the precise hours of prayer according to the degree of longitude of each area. Most mosques used this system until well into the sixteenth century when mechanical clocks came into use, although there was a clock in the main minaret of the mosque in Damascus as early as the thirteenth century.

The Ottomans were not the first Muslims to conceive of a mechanical timepiece; for the earliest descriptions of both theory and technique, they are indebted to earlier Arab scientists (*Aramco World,* May–June, 1976), who were first to describe the use of astrolabes to measure the altitude of the sun in order to determine the time for prayer and determine the direction of Mecca. Notable among them were the mathematician al-Khwarizmi and the astronomer al-Qashrami. In Abbasid Baghdad, the bibliographer Ibn al-Nadim was one of the first authors to write on the subject of time, giving details of mechanical clocks, sundials and waterclocks. The encyclopedist al-Jahiz, writing in the ninth century, boasted: "Our monarchs and scholars use astrolabes during the day and waterclocks during the night to ascertain the hour and have certain other instruments for measuring the shadows of the sun. . . ."

What the "certain other instruments" were can only be guessed, but they may well have been a primitive form of geared clock. During the reign of the famous Abbasid Caliph, Harun al-Rashid, mention is made of "a clock that strikes at the hours," which he sent with a delegation to the Emperor Charlemagne along with several waterclocks (*Aramco World,* March–April, 1977). These clocks may have been, in the opinion of many European historians, the first in Europe.

By the sixteenth century, the date of the first Turkish clocks, many

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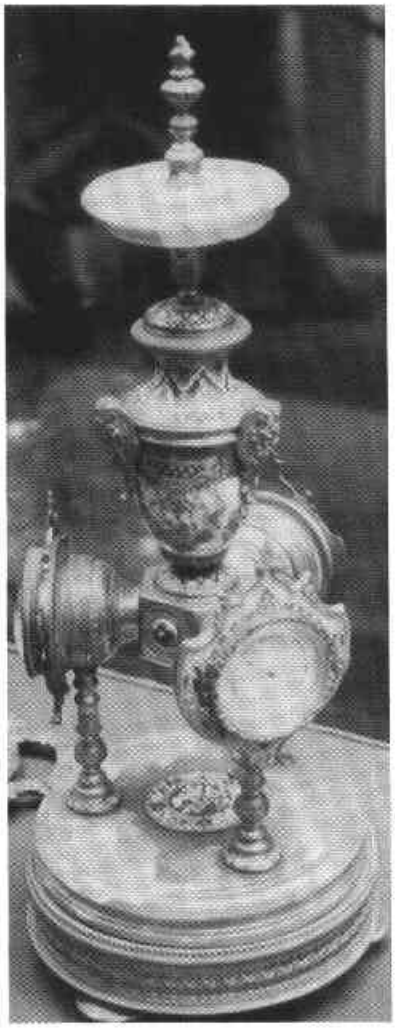

Left, Figure 4. Three-dial table clock, gold, onyx and cloisonne. Right, Figure 5. Tower clock at the Dolmabahce.

books had appeared in Arabic and Persian on the subject of time, with such titles as "How to Determine the Time of Prayer and the Direction of Mecca," and "How to Repair Sundials," suggesting a wide interest in the subject. Two books in particular laid the groundwork for the Turkish clockmakers.

One, by the Arab scientist al-Jazari, called the "Book of Knowledge of Mechanical Contrivances," also known as the "Treatise on Automata," furnished detailed drawings of over 50 mechanical devices, including clocks. The other, by the astronomer Taqi al-Din Muhammad ibn Ma'ruf, published in Istanbul, described the mechanics of astrolabes and observational telescopes as well as weight-driven clocks. These indicated hours and minutes and could determine the time of prayer "without having to observe the heavenly bodies," that is, when indoors or on overcast days.

The detail provided by al-Jazari and Taqi al-Din amounted to a "how-to-do-it" manual for the Ottoman clockmakers, who seem to have been the first among Muslims to actually go ahead and construct an elaborate mechanical timepiece.

As in medieval Europe, where the first geared clocks are believed to have appeared in monasteries to help regulate the daily prayer services, so in Istanbul the first Turkish clocks were made in the *tekkes,* or monasteries, of the so-called "Turkish monks," the Mevlevi Dervishes, better known to Westerners as the "Whirling Dervishes." The Mevlevis were considered the most intellectual of the Dervish orders and were well known for their interest in music and the arts. They acquired an interest in making mechanical clocks, their elders now suggest, to help initiates of the order observe fixed prayer times during long periods of meditation. More reliable than sundials and not requiring as much attention as a waterclock, the clocks also provided a focus for the communal life of the monastery.

As artisans, the Mevlevis prided themselves on producing flutes, embossed swords and other *objets d'art.* Clockmaking required a combination of talents. The purely mechanical aspect drew upon the genius of scholars like Taqi al-Din, who had studied Arabic and Persian scientific writings, while making the outer encasement required the coordinated skills of metalworkers, cabinet makers, and jewelers. Available manuscripts say very little about the actual method of manufacture, but it is apparent that the Mevlevis spent several years on each timepiece, with only the most basic of hand tools. Occasionally, the same artist would make the entire apparatus, from the inner gearwork to the intricately embellished case.

The outer design frequently took the shape of the Mevlevi headdress. This consisted of a felt hat like a tall, overturned plant pot, encircled at the base with a turban; it served as a symbol of the order and usually appeared as a sign on top of the *tekke* or on the Dervishes' gravestones.

An extraordinary example of encrusted jewel work and embellishment is the round wall clock signed by Shahiz, made about 1650. Covered with filigree work with inlaid rubies, emeralds and diamonds, the face is in the form of a wreath in blue enamel with white numbers, and the back—which, of course, was rarely seen—is also richly engraved with leaves and fleurons. A pocket watch, made by Meshur Sheyh Dede in 1702, shows, as well as hours and minutes, Gregorian and Arabic calendars and the signs of the zodiac.

A clock made by Mehmet Sükrü in 1853, thought to be the only one of

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its kind, has a double escapement mechanism which permits it to operate unaffected by extremes in temperature. Another, made by Ahmed Dede about 1865, has a combination escapement and pendulum mechanism which is also insensitive to variations in temperature and is accurate to less than one second per 24 hours.

Many of these timepieces, now on display at the Topkapi Palace, were presented to the Sultan by the Mevlevis as a sign of their loyalty. A sixteenth century illuminated manuscript shows a procession of different artisans before Sultan Murad III, and an account of their visit in a royal diary mentions among those who presented themselves to the Sultan, the "magic" Mevlevi clockmakers. As the assembled audience watched in amazement, the diary tells us, they entered the hall with an oversize model of a clock gearwork mounted on a wagon. A hammer automatically struck the gearwheel, turning a second wheel which, the chronicler observes, "could perform the work of a dozen persons." The Sultan and his audience burst into applause and cheered the clockmakers as they pulled their display away.

The first non-Turkish clocks appeared in Istanbul early in the sixteenth century, when a delegation sent to Germany by Suleiman the Magnificent to attend the investiture of the Emperor Maximilian, returned with several "clocks of value." An English traveler who visited one of the Sultan's palaces in the early 1700's described "tables of silver and precious woods, along with Persian carpets, Venetian mirrors and a gold English clock with a dome made of diamonds."

Soon the Sultan's various palaces were filled with clocks given by visiting European dignitaries, including floor models which played Turkish melodies, watches with an enameled portrait of the Sultan and dome-shaped table models in baroque style.

European clockmakers later opened branches in Istanbul and by the eighteenth century they were designing for the "Turkish market" models featuring a face with Arabic numerals and somewhat garish "oriental" encasements. These clocks became a common feature in well-to-do houses along the Bosporus.

Figure 6. One of the matched pair in the formal greeting hall of Topkapi Palace.

Ottoman clockmakers also began to imitate the imported models. One of the last known Turkish clocks, made in Istanbul by Ismet Dersadet in 1900, is a large table clock mounted in tortoise shell, bearing the coat of arms of Sultan Abdul Hamid II and patterned closely after a popular series of ninteenth century English clocks.

The small number of Turkish clocks in the Topkapi Palace collection doesn't indicate, as might be assumed, that European competition eventually forced the Turkish clockmakers out of business. In fact the Turkish clocks were, from the beginning, a labor of love by scholar-craftsmen motivated by religion, their interest in art, and devotion to the Sultan. They were never concerned with profits or large-scale production. In fact, before the Republican regime banned all Dervish orders in 1923, the Mevlevis probably actually made few more than the some 30 timepieces known to have survived in the Sultan's palaces and in the houses of their order, a uniquely Turkish contribution to Muslim craftsmanship.

About the Author

James Horgen, formerly with *Aramco*'s Arabian Research Division, writes on Arab history.