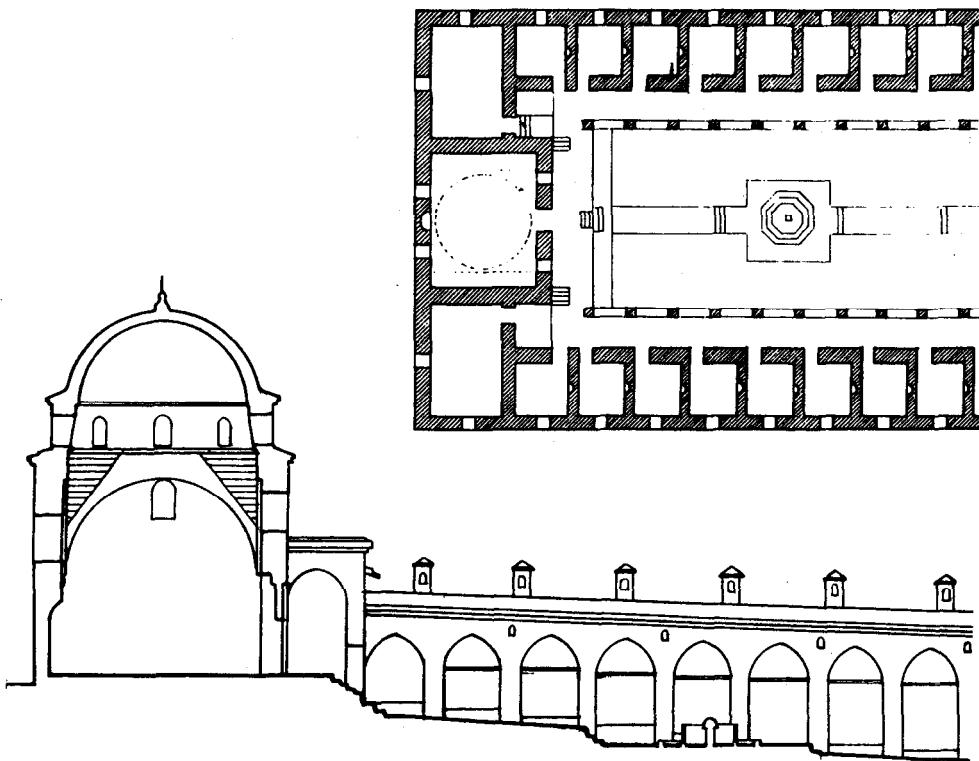


# Dendrochronologically Dated Ottoman Monuments

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## INTRODUCTION

Dendrochronology or tree-ring dating has been carried out by the author in former Ottoman lands since 1973. The method is, at its simplest, to compare the alternately small and large annual growth-rings from trees from a given climate region—in this case as far west as Bosnia and as far east as Erzurum—and to match them so that a unique year-by-year growth profile may be developed. By means of this a precise date determination, accurate even to the year in which the wood was cut, is possible. See Kuniholm (1995) for a fuller discussion of the method; and then see Kuniholm and Striker (1983; 1987) and Kuniholm (1996) for earlier date-lists of Ottoman, post-Byzantine, and Byzantine buildings, including brief notices of dates for a dozen more dated Ottoman buildings, principally in Greece, and additional notices of sampled but not yet dated buildings which are not repeated here.

What follows is a compilation, in reverse chronological order, of over fifty dated buildings or sites (more if one counts their constituent parts) from the nineteenth century back to the twelfth (Figure 4.1). Some are major monuments (imperial mosques, sarays, şifayes) clearly deserving of more comprehensive treatment than can be provided here; others (türbes, mescits, obscure medreses, and private houses) are little-known, perhaps even unheard of except to specialists; but all help to form part of the tree-ring sequence which begins with the rings of trees still standing in Turkish forests and extends in an unbroken chain to A.D.360 for oak, A.D.743 for pine, and A.D.1037 for juniper. All these buildings are part of Ottoman history, no matter

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*A Historical Archaeology of the Ottoman Empire: Breaking New Ground*, edited by Uzi Baram and Lynda Carroll. Kluwer Academic / Plenum Publishers, New York, 2000.

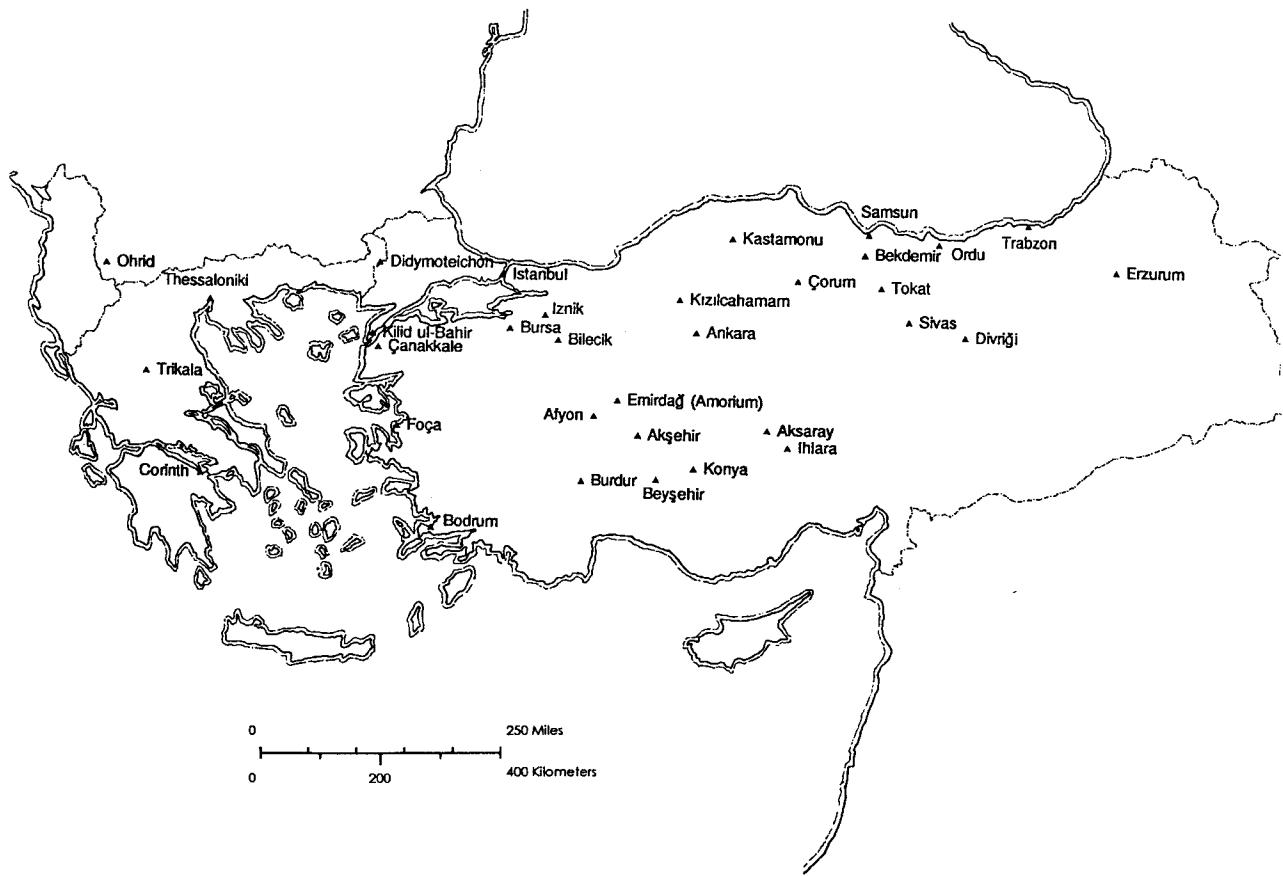


Figure 4.1. Anatolia, showing locations of sites mentioned in the text.

how big or how small they may be. Indeed, some of the lesser monuments have the most important tree-rings in this long chain and therefore merit inclusion in this tabulation for that reason alone. Omission of one or two of them might break the single chain of connected tree-rings into undated parts. Obscure monuments are deliberately given fuller treatment than monuments that are well-known. In other words, the length of any discussion below is not at all governed by the architectural or historical importance or the beauty of the monument. In this list I use the word 'Ottoman' in the broadest possible sense to include monuments which are more properly Beylik or Seljuk but which are part of the same architectural tradition. For a compendium of plans, photographs, and other documentation see the five volumes by Ayverdi (1982, 1989a-d), three by Ayverdi *et al.* (1980, 1981a & b), and one by Yüksel (1983). For a set of drawings and photographs under a single cover see Yetkin (1965). For medreses see Kuran (1969).

*Note 1:* Some of these monuments are dated by inscription or are mentioned in the texts; others are not. In some cases the dendrochronological evidence is the only means for securing a date. It is instructive to compare the similarities and dissimilarities between the two types of evidence when both are available. Generally, Ottoman building practice was to use wood as soon as it was cut (Kuniholm and Striker, 1987, 387-391). The exceptions to this rule stand out for that very reason.

*Note 2:* The following terms are used to explain the quality of the date:

- v There is some subjective reason for believing that the last preserved ring is within a few rings of the terminal ring (= last ring formed before the tree was cut down).
- vv There is no way of estimating how far the last preserved ring is from the original terminal ring.
- + The specimen's last preserved ring can be counted but not measured (e.g., a partial ring is preserved).
- ++ Several outer rings can be counted but not measured.
- B Bark is present (therefore the terminal ring is present).
- WK Waney Edge ('English' English, no satisfactory 'American' English equivalent) = Waldkante (German) = the ring immediately under the bark.
- BG Beetle Galleries (terminal ring probably present).
- c Outermost ring is continuous around the full circumference of the sample.
- r Outermost ring is continuous for a good portion of the circumference.

The symbols B, WK, BG, and c indicate terminal rings and therefore cutting dates in decreasing order of confidence, unless a + or ++ is also present.

*Note 3:* Average sapwood in Aegean oaks has been calculated to be 26 ± 9 years. The importance of this observation is that despite the absence of bark on the exterior of a trimmed sample it is nevertheless possible to arrive at a reasonably close estimate for the felling date. For details on how this sapwood calculation was performed see Kuniholm and Striker (1987, 387–391).

*Note 4:* Monuments #5, 18, 20, 24, 28–30, 33, and 35 were investigated between 1982 and 1987 in a collaboration with C. L. Striker. We trust that he will have some useful architectural comment to add some day, but he is not responsible for the dates given below.

## DISCUSSION OF STRUCTURES AND THEIR DATES

### 1. Small Late Wooden Mosques above Trabzon Various Nineteenth-Century Dates

Of a number of small, late Ottoman mosques near Trabzon visited in 1991, seven can be dendrochronologically dated, all in the nineteenth century. They are little, box-like wooden buildings, sometimes provided with a porch (*revak*), sometimes not. The wood is usually chestnut (not an optimum species for dendrochronology) or fir. Dates of the last-preserved rings are as follows:

- |  |                        |
|--|------------------------|
| a. Trabzon, Boztepe, Ahi Evren Dede Camii                  | 1855++vv<br>(chestnut) |
|  | 1854+vv (fir)          |
| b. Çaykara, Dernek, Güney Mahallesi Camii                  | 1880+vv<br>(chestnut)  |
| c. Çaykara, Dernek, Kondu Mahallesi<br>Merkez Camii, porch | 1894+vv<br>(chestnut)  |

Comment on the Merkez Camii: The inscription to right of the door reads H.1224 (A.D.1809/1810). On the basis of the one datable sample, it appears that the porch has nothing to do with the part of the building to which the 1809 inscription refers.

d. Of, Bölümlü, Mithatpaşa Camii	1874+vv (chestnut)
e. Sürmene, Karacakaya Camii	1863+vv (beech)
f. Of, Uzungöl, Filak Mahallesi Camii	1897+vv (fir)

**Comment on Filak Mahallesi Camii:** The inscription reads H.1228 (A.D.1813–1814), so the dated wood samples must be repairs.

g. Of, Sugeldi Köyü Camii 1843+vv  
(chestnut)

For a recent discussion of this set of buildings with map, bibliography, and some plans see Karpuz (1990).

## **2. Samsun, Bekdemir Camii (Two Phases) 1585ff. and 1876B**

The small village of Bekdemir is 10kms east of Kavak, about 45kms south of Samsun at an altitude of 575m. above the Black Sea. Next to the village square (*meydan*) is a small, unpretentious wooden mosque which holds about 45 people comfortably. The mosque is an almost square box, made of large adzed, undecorated (with two exceptions), oak planks (*pelit* in the local idiom), averaging 5cm. thick and ranging from 20cm. to 44cm. high. The average height of a plank is 38cm., although the planks nearer the ground are generally larger than the planks nearer the roof. The first and second story are separated by two extra-wide horizontal planks decorated with a moulding and a row of palmettes carved in relief, painted green and yellow. These wider planks also mark the transition from the mosque proper to the gallery (*kadinlar mahfili*). The floorboards and joists of the latter do not project outside the shell of the building. All exterior planks are lap-joined to one another so that the ends project about 25cm. from the corners. We also saw evidence of vertical dowelling. The mosque is divided halfway down both east and west walls by vertical struts. Only the two decorated timbers span the entire building. The rest of the mosque, punctuated as it is by windows and the vertical struts, is made up of rather short (two to three meter) lengths of planking. To the naked eye all the exterior planking seems to be about equally weathered, and the preparation of the woodwork seems identical except for the two ornamented courses. There are no obvious signs that this might represent more than one building phase.

Not much is known about the mosque's date. An inscription over the mihrab dates from about 120 years ago. Nobody in the village knows whether the inscription refers to the date of the decoration.



**Figure 4.2.** Samsun, Kavak, Bekdemirköy, Camii. Boards below the moulding were cut after 1585. Boards above the moulding were cut in 1876. (P. I. Kuniholm, ADP)

(*süslême*) of the mosque, or to the installation of the mihrab and minber, or to the mosque's rebuilding. The timbers of the mosque are said (local folk memory) to have been brought from the former village of Ortaköy near the river below Bekdemir. A 92-year-old informant said his 110-year-old grandmother told him the mosque was in its present form during all of her lifetime.

At the request of the Samsun Vakıflar Bölge Müdürlüğü in less than a day and a half we collected 42 samples. Most planks had 100+ rings; some had 200+; others had 300+. At least two timbers had the bark preserved, and we estimated that we should be able to build a chronology at least 400 years long. We finished with a chronology of 398 years for the first floor and 395 for the second floor. Since the two chronologies overlapped, although just barely, the final total for the mosque is 789 years from 1088 to 1876. Of considerable interest is that both the local folk memory and the tentative inscriptional interpretation of the history of the mosque seem to be correct. The oldest timbers, those nearest the ground and below the ornamental moulding, were cut from trees which were born as early as the 11th century and were felled near the beginning of the 16th century. There are no signs of reuse on any of these timbers, so, if the story of a rebuilt mosque is true, the

form and dimensions must have been the same for both the old and the new building. Above the ornamental palmette moulding which runs across the building about two meters above the porch floor are timbers which were cut in 1876. The bark is present on two of them.

Several questions remain unanswered. If a mosque was well-enough preserved so that it could be moved to Bekdemir and re-erected, why were there just enough timbers for the lower half of the building? Did Building #1 burn at the old location, thereby rendering half the timbers unusable? If so, there are no signs of burning or other damage on any of the older timbers at Bekdemir. If the whole mosque was moved intact to Bekdemir and then fire or some catastrophe occurred, thereby destroying the upper half, there is neither any folk recollection of it nor signs indicating an incendiary reason for the rebuilding. It is also curious that there is no intermixture of old and new timbers. Downstairs is 100% earlier wood, and upstairs is 100% later wood.

The tree-ring chronology from the Bekdemir mosque serves as a cross-check or a time-control on the correct chronological placement of some 65 buildings or chronologies ranging in date from the 12th century to the 20th, and ranging as far afield as 1,300 kilometers or over 800 miles. The monuments include Islamic structures, Orthodox (both Greek and Serbian) churches and monasteries, civil buildings, and military fortifications. Combining Bekdemir with the forest chronology from Zonguldak Yenice, we now have a Black Sea Oak chronology extending back to 1058. Several distant sea-side monuments whose tree-ring profiles closely match Bekdemir may have been built with oak imported from the Black Sea coast. They include İstanbul Hg. Sophia Northwest Buttress, parts of the Thessaloniki Octagonal Tower (Frourio Vardari), Çanakkale Cezayırlı Hasan Paşa Kökü, and İstanbul Karaköy Vapur İskelesi (see below).

The little mosque at Bekdemir is therefore the most important single monument (dendrochronologically speaking) we have visited in 25 years. A non-chronological observation may be made here for the one timber whose pith rings at either end may be dated. The tree from which it came took 22 years to grow 6.90 meters or 22'7".

### 3. Karaköy Vapur İskelesi

1858B

In 1997 at the İstanbul Archaeological Museum we were given 18 oak logs from a spiked-together grid-section extracted from an enormous harbor construction (apparently a revetment of some sort) of utterly unknown date. They appeared when foundations for a bank were dug behind the ferryboat landing in Karaköy in Galata. Another 100 timbers were saved for us in the bank's storage rooms in the event

that the first 18 proved interesting. The inch-thick hand-wrought spikes could have been from any pre-industrial-age period. Indeed, in the absence of any pottery, we were told that the date could be anything from the 6th century to the present, and we all rather hoped the wood might be early Byzantine.

Most of the wood was cut in 1858. The long timbers match the Black Sea forest profile from near Samsun, and the short cross-pieces match the Thrace profile. None are from the Belgrade Forest, Istanbul's chief local supply of oak. So what we imagine is a huge Ottoman harbor-works project (the plans and photographs we have been given by the Istanbul Museum curators show at least 220 timbers), with ships bringing in wood to the capital from both east and west. There they were spiked together, buried in a clay and gravel fill next to what is today the Yolcu Salonu and the bustling harbor of İstanbul, and—by now—quite forgotten. It will be interesting, now that we have a fixed date, to see whether any of the researchers working in the Ottoman archives can find a reference to construction activities in Karaköy in 1858.

#### **4. Aksaray, İhlara, Bezirhane**

**1842v**

In 1997 at the request of the museum director we investigated the so-called Bezirhane, also known as the Yağ Fabrikası, in İhlara, Aksaray, a multi-roomed, subterranean 'factory' dug out of the tuff in the usual Cappadocian fashion. The guard reports that older villagers remember when the oil press was functioning in the late 1920s.

Two parallel, horizontal logs anchored to the rock form the support for a wooden crosspiece which is threaded to receive a vertical threaded tree-trunk, approximately 0.35 m. in diameter, which is turned by a cross-bar near the bottom (virtually a capstan arrangement) so that the bottom end of the wooden screw presses into a cut stone basin. Sections of old screws lying about the cavern attest to the fact that these hand-cut timbers must have snapped fairly regularly during use.

As an experiment to see whether the remaining wood pieces could be dendrochronologically dated, a sample was collected as a test from one of three horizontal members supporting the linseed oil press. The last existing ring was 1842, but clearly the operation could have gone on for centuries with replacement parts being inserted as needed.

#### **5. İstanbul, Altunizade Köşkü**

**1834B**

The Altunizade Köşkü, a handsome villa of the nineteenth century and thought to date from the 1830's, stands just beyond the exit of the



**Figure 4.3.** Foça, Kaleburnu, slipway for boats (?). Last-preserved rings range in date from 1516 to 1807. (P. I. Kuniholm, ADP)

central *iwan*, the juniper door lintel has a last-preserved ring of 1820. In the same room, a stretcher in the west wall, also of juniper, has a last ring from 1815. Both timbers, therefore, appear to belong to the 1824 repairs. Other timbers in the medrese, not yet dated, may be from an earlier time in the life of this building (Kuran, 1969, 92ff., including plan, elevation, and references for the 1271 foundation date).

## 8. Foça, Kaleburnu Castle

**1516vv to 1807vv**

Kaleburnu Castle on the peninsula south of Foça is thought variously to be as early as Genoese or as late as Late Ottoman (Professor Ömer Özügit, the excavator of Phokaia, personal communication). At the tip of the point on the west, the rock of the promontory was trimmed



**Figure 4.4.** Foça, Kaleburnu. The Turkish Navy helps Laura Steele collect a dendrochronological sample. Last-preserved rings range in date from 1516–1807. (P. I. Kuniholm, ADP)

down to make an almost vertical face north-south. Along and against this face is a north-south wall about two meters thick with a series of blind arches which end at the jagged, untrimmed rock. Projecting west from all of this are two east-west walls, about four meters thick which extend west about ten meters before angling toward each other. The extreme west part of the construction is now gone, but a hexagonal or pentagonal plan seems reasonable. Almost at water-level are a series of irregularly sized and irregularly spaced arches (three and a half preserved on the north and two and a half preserved on the south) of irregular width (approx. 2 to 4.5 meters wide) and about 4 meters high. They could have been gun-ports, which does not make much sense since the guns would have been at sea-level and could not have been trained with much latitude. A much better position for siting the guns would have been the top of the promontory. The arches make more sense as slipways through which small boats could have been dragged or winched as at some of the Mt. Athos monasteries. The floor of this area is made of large flat stone slabs, many of which appear to have come from the classical constructions of Phokaia. About a third of the floor on the east is preserved, the rest having been taken away by stone robbers.

We have now a series of fifteen timbers with a variety of end-dates ranging from 1516 to 1807. Many of the gun-embrasures and/or boat-slips appear to have been added piecemeal over a period of centuries from the sixteenth century onward. If this had been the first medieval structure we had visited for dendrochronological sampling, we would have been very puzzled indeed.

### 9. Çanakkale, Cezayırlı Hasan Paşa Köşkü

Spring  
1783B

For a recent, well-illustrated, and well-documented discussion of this square, turreted tower on the Trojan plain see Ayda Arel (1993). Her conclusions (pp. 183 and 186) illustrate the problem of trying to fit the absolute dendrochronological date of the felling (spring of 1783 with



Figure 4.5. Çanakkale Cezayırlı Hasan Paşa Köşkü, exterior. (P. I. Kuniholm, ADP)



**Figure 4.6.** Çanakkale Cezayirli Hasan Paşa Köşkü, interior. All the stretchers were cut in Spring 1783. (P. I. Kuniholm, ADP)

the bark still preserved) of the oak timbers, which form the second and third story string-courses that serve as chain-beams around the interior, with the accounts of a traveler (Lechevalier in 1785 who observed that the Grand Admiral was having his kiosk repaired). We cannot move the cutting date earlier than 1783 as Arel proposes we do, but the Grand Admiral's carpenters could very possibly have been using wood in 1785 that had been cut only two years previously.

#### **10. İznik, Şeyh Kutbeddin Mosque & Türbe      1382vv, 1470vv, 1710++vv, etc.**

West of the Yeşil Cami and immediately south of the Nilüfer İmaretı (Otto-Dorn, 1941, 33–35) is a small türbe and ruins of a

mosque, 8.50 m. square (#6 on her map XVI and see her Taf. 18 and Taf. 19). The structure is square in plan, and perpendicular to it toward the northwest is an adjacent square-planned mausoleum, northeast of which is the minaret. The inscription is lacking, but Kutbeddin is thought to have died in H.821 (A.D.1418). Otto-Dorn therefore says the türbe dates from the early fifteenth century, probably close to 1418. The mosque and minaret are believed to have been a gift of Halil Çandarlı Zade (d.1453), but Otto-Dorn does not go beyond saying that they (the mosque and minaret) are later than 1418, noting the differing masonry styles between türbe and mosque/minaret. See Ötüken, Durukan, Acun, and Pekak (1986, #108–#109, 250–253) for another description of the building and a discussion of the building's 15th century founding and history. There seems to be agreement that the mosque was built the same year that Mehmed Muhyiddin Kutbeddin died. There is disagreement on whether the mosque and mausoleum were built simultaneously or consecutively. The eighteenth-century repairs noted below are not relevant to this argument.

In the türbe, south window lintel, the last-preserved ring is 1382vv, but as many as approximately 20 rings may be missing from the exterior. This is the one timber that appears to be certifiably primary.

In the north-south wall, a fallen oak timber from the header and stretcher system has a last-preserved ring of 1470+vv but no bark. The wall has a joint with the türbe and was suspected to be a later modification even before we started measuring.

In the north-south wall about 15 m. south of the türbe, aligned with its east side is a north-south oak stretcher. Several rings appear to have suffered from frost damage (A.D.1655, 1656, and 1672). The last existing ring is 1710++vv. We suspect, but cannot yet prove, that there are other late (eighteenth-century) timbers in the ruined walls of the türbe.

What we have, in summary, is one or more interventions (to the türbe itself), or additions (the porch and adjacent rooms), as late as the 18th century to a building that was already three centuries old.

## 11. Çorum, Eski Yapar, Hüseyin Dede Türbesi 1781v

Above the Bronze Age archaeological excavation site of Eski Yapar, investigated by the Museum of Anatolian Civilizations in Ankara and its then director Raci Temizer, stood the small türbe of one Hüseyin Dede. In 1982, prior to the türbe's removal to adjacent ground to facilitate the work of the excavators, we cored several of its pine posts. The cutting date was either in or very shortly after 1781. I do not believe

the türbe is published and have been unable to find out anything about Hüseyin Dede.

## 12. Sivas, Divriği, Ulu Cami, Hünkâr Mahfili 1240v, 1665v, 1766WK

This construction is a real curiosity. In a corner of the Divriği Camii and Darüşşifası, a majestic building famous for its ornate stonework (Önge, Ateş, and Bayram, 1978), is an improbably crude wooden platform, or *mahfil*, about four meters high, bearing little or no relation to the intricately carved stonework around it (see photographs in Önge, *et al.*, pp. 153–154). Modern restoration of the roof at Divriği was in progress when we arrived—with quantities of new (machine-cut) and old (hand-adzed) timbers heaped on every side—which should have warned us of the possible dangers in interpretation of reused wood from other centuries. Of the five datable timbers in the *mahfil*, two are from the thirteenth century (1240 or shortly after the time of the building's construction); two are from 1665; and one is from 1766. Several timbers show cuttings which serve no current purpose, indicating prior use. Our best interpretation is that the so-called Hünkâr Mahfili is a



Figure 4.7. Divriği, Ulu Cami, current roof repairs. (P. I. Kuniholm, ADP)



**Figure 4.8.** Sivas, Divriği, Ulu Cami, current roof repairs. Some of the tumbled timbers show signs of 20th century machine-cutting. Others are adzed beams from the 13th century. (P. I. Kuniholm, ADP)

construction of the eighteenth century or later, incorporating timbers from the thirteenth, seventeenth, and eighteenth centuries. The mahfil at Divriği is a rare instance of a single construction where the wooden members date from a span of over five centuries. If only the two pieces from the thirteenth century had been sampled, an entirely erroneous conclusion about the date of the mahfil might have been reached.

### 13. Konya, Mevlana Müzesi, Semahane

1571B and  
1732+v

Four samples from under the northwest pier (*fil ayağı*) of the dance floor were collected during 1997 renovations by the Konya

Museum staff. The samples are thought by the excavator Mr. Naci Bakırıcı to be from the sixteenth century from a grid system underneath the pier. There are records of renovations in 1816 under II. Mahmut, and later in 1954 and 1983.

A half section of pine from on top of the grid, possibly (according to Mr. Bakırçı) from renovations of 1816 (II. Mahmut) or from even later ones, has a last ring of 1732, and we estimate that few, if any, rings are missing. Three oak sections from lower down in the grid with 286 rings preserved had so many fire scars—and therefore erratic ring-growth—that they were extraordinarily difficult to date. They were cut in the spring of 1571.

## **14. Erzurum, Çifte Minareli Medrese, Repairs 1306vv, 1717vv**

We have one squared juniper lintel beam from the upper story, northeast corner room, north-south lintel between this room and the room immediately to the west. The context is clearly not original, and the last ring is 1717vv.

An east-west pine plank (southern of two) forms a door lintel at the head of the northwest stairs to the second story. The doorway is to the second room from the northwest corner, also probably not an original context. The last ring is 1306vv, or almost half a century after the supposed primary construction (inscription 1271). See drawing in Kuran (1969, 119, Fig. 65; also Rogers, 1965, 63–85, particularly the appendix in the latter in which the arguments about its date are set forth).

## 15. İznik, Çandarlı Kara Ali Türbesi, Wall (an Afterthought?) 1718++vv

This is a small türbe (opposite today's fire-station) on the north side of the main street leading from the Sea-Gate to the Lefke Gate (#11 on K. Otto-Dorn's 1941 map XVI [where it is called the Halil Paşa Türbesi], and see her text pp. 86–88). The inscription reads H.857 (A.D.1453) according to Otto-Dorn who inadvertently records A.D.1435. Ötüken *et al.*, (1986, #91, p. 218) cite this as 'yaklaşık H.834/A.D.1430'. Somebody needs to go back and check the arithmetic.

Six oak headers and stretchers at various heights from 1.64 m. to 2.86 m. above grade, forming a framing in the mudbrick (*kerpiç*) wall surrounding the tombs, have a last-preserved ring at 1718vv. The surrounding wall could be either a pious afterthought or a replacement.

for some kind of wall that presumably was erected in the fifteenth century (Ötüken, Durukan, Acun, and Pekak, 1986, #91, 218–219).

## **16. Burdur, Koca Oda, Various Phases      1654B, 1712vv (repair?)**

The Koca Oda, also known as the Baki Bey Konağı or the Çelikbaş Konağı, is a handsome ‘Anadolu Evi’ recently restored by the Burdur Municipality and the Vakıflar. The house has pine porch joists, north side of building, supporting an *eyvan* above. All are likely to be primary. They are not dated as of March 1998.

In the ground floor ‘Konferans Salonu,’ three large north-south juniper joists (est. diam. 0.37m.) support 38 east-west floor joists. Beam #2 from the south has a terminal ring at 1654B. The easternmost joist has a last ring from 1712vv (a repair?).

The pine samples from this site do not crossdate well with each other or externally with any of our forest master chronologies. It is thus impossible to determine whether the joists and posts they were taken from were cut at the time of building, were reused wood, or were repairs put in at various later dates. These samples are a puzzle, and we need more pine samples from the immediate area to solve it.

## **17. Kızılcahamam, Hıdırlar Camii      1704v**

In the winter of 1996–1997, colleagues in the Vakıflar (*Abide Şubesи*) sent us photocopies of wood from an inscriptionless mosque in Hıdırlar Village near Kızılcahamam north of Ankara. Photocopies are problematical because one cannot sand them to improve their appearance before measuring. However, the architects in the Department of Monuments had done a fine job of polishing the wood before putting the timbers on the copy machine, and we were able measure the photocopies directly and from them to report a date of 1704 for both a foundation beam and an upstairs window lintel. In the summer of 1997, we were given the wood and measured it just to be on the safe side. The date is still 1704.

## **18. Ohrid, Sv. Sofija, Ottoman Modifications to the Naos      1673B**

This three-aisled eleventh-century Byzantine church, visited in 1987, yielded 30 tie-beams from the naos which are clear evidence of Ottoman use of the building (‘Fethiye Camii’ in Ayverdi EIII:3, 1981,

136). The mihrab and minber are still preserved, and the pointed arches were a signal, even before we started drilling, that we were dealing with Ottoman modifications. The 1673 cutting date is only four years after a severe earthquake damaged much of the Dalmatian coast according to the Director of the Zavod za Zaštitu Spomeniku Kulturu in Priština.

### 19. Bilecik, Vezirhan (Köprülü Mehmet Paşa) 1657B

This kervansaray on one of the old silk roads, largely destroyed by fire in H.1331 (A.D.1912/1913), was a foundation of Köprülü Mehmet Paşa. The building is divided in halves with the remains of cubicles along both the long sides, each equipped with fireplaces, chimneys, and storage niches, and each large enough to accommodate a party of travelers and their animals. The framing timbers in the window niches of the south end of the building were cut in 1657. I am told by colleagues (but have not seen the text myself) that Kâtip Çelebi in the *Cihannuma* gives the date as H.1070 (A.D.1659/1660), a year or two after he died(?!). This apparent discrepancy will have to remain a curiosity until I can track down the reference.



**Figure 4.9.** Bilecik, Vezirhan (Köprülü Mehmet Paşa), exterior, from the old caravan road. (P. I. Kuniholm, ADP)



**Figure 4.10.** Bilecik, Vezirhan (Köprülü Mehmet Paşa), central courtyard, with timbers cut in 1657. The function of the timber above and to the left of the doorway is inexplicable. (P. I. Kuniholm, ADP)



**Figure 4.11.** Bilecik, Vezirhan (Köprülü Mehmet Paşa), south end, with timbers cut in 1657. Each bay has a chimney, a slit window, and a storage niche for food and valuables. The bandstand is modern. (P. I. Kuniholm, ADP)

**20. Thessaloniki, Frourio Vardari  
(Octagonal Tower)****Spring 1597B**

On the west side of the harbor in Thessaloniki is a three-story octagonal tower which is the analogue to the Leukos Pyrgos defending the harbor on the east. From this monument a set of chain-beams was collected. They run horizontally around the inside of the octagon and are cut both to fit one another as well as to be held in place by enormous iron spikes driven vertically into the masonry of the walls. The last existing ring just under the bark has springwood cells from late April or early May, 1597. There is a good possibility that some of the wood in the tower is imported from the Black Sea coast. There is also unpublished documentation for the building which has reportedly been found by Machiel Kiel in the Ottoman archives in Istanbul.

**21. Yassıada (Bodrum), Ottoman Shipwreck** **1572vv**

This shipwreck just off Bodrum, excavated by Cemal Pulak, has a sixteenth-century 4-real silver coin from Seville (Philip II, 1566–1589) to help date it (Pulak 1984–1985:10–15). The cargo has its best parallels in the North Aegean and Black Sea. Similarly, our best dendrochronological fits for the best-preserved oak timber are from northern sites (see also Pulak 1983, 1984).

**22. Burdur, Taş Oda** **1342vv, 1479vv, 1546vv,  
1566WK, 1569vv**

From this handsome konak or ‘Anadolu Evi’ in downtown Burdur, not far from the Koca Oda (above), and also recently restored by the Burdur Municipality and the Vakıflar, a 464-year juniper chronology was developed which provided more dendrochronological than architectural information because it pushed our absolutely-dated ring-sequence back to 1103. A check with the Burdur Kültür Müdürlüğü and the Vakıflar for information on historical sources, if any, for this building and the Koca Oda has not yet turned up anything useful.

Pine and juniper cores were drilled from the three squared beams of the door lintel in the north-south wall at the north end of building, the original exit to the west (but which now opens into a blank wall). The context suggests that it is not necessarily from the primary phase of building. The last existing ring is 1569.

From the ground floor, in the old stable (now the porch) at the north end of the building, a north-south beam projects into the store room. It performs no structural function. Our best guess is that it might have supported a lantern. It is not necessarily from the primary phase. This sawn juniper cross-section was cut in 1566.

Also from the ground floor, in a store room immediately south of the stable/porch, we drilled two juniper cores. The cores with last-preserved rings at 1546 (north end of the room) and 1342 (south end of the room) should be primary. We do not have a ready explanation for the difference in dates except that one of the timbers could have been reused. A juniper section from a squared header in the east wall above and north of the door could be from any time (either primary or a repair). Its last ring is 1479.

### **23. Afyon, Emirdağ, Amorium, Step Trench                  1564vv**

Junipers from a mixed (but late) context in a step-trench on the north side of the acropolis at Amorium have a last preserved ring of 1564. How many rings are missing due to the fire which carbonized them we do not know. The excavator, Dr. Christopher Lightfoot, has found Ottoman material of various kinds in this step-trench (Lightfoot 1994).

### **24. İznik, Elbeyli, [so-called] Mara Camii                  1555+vv**

This roofless ruin, to which we were conducted by archaeologists Bedri Yalman and İşık Soyтурk, stands in the fields near the village of Elbeyli. They say that the building is of unknown date and suspect the name. Ötüken *et al.*, (1986:269) merely call it 'Cami' and note there is a plaque from a soldier of Sultan Abdülhamid's in one wall. The overgrowth of vines and fruit trees made examination difficult and the making of even a sketch plan almost impossible. A set of oak stretchers was collected from the inner walls, and they form a homogeneous group with the last ring in 1555. Sapwood starts in 1538, so not much wood is missing from the exteriors ( $1538 + 26 \pm 9 = 1555-1573$ ).

### **25. Aksaray, Çanlı Kilise, Coffin Lid                  1532vv**

At Çanlı Kilise near Aksaray an old cedar door was reused as a coffin-lid at some unspecified time between the eleventh century and the twentieth centuries and buried in the narthex. Recently tomb-

robbers in search of treasure disturbed the grave, flinging the coffin-lid aside. Since the wood was in fine shape, we borrowed a piece of it from the Aksaray Museum in 1997, and the last-preserved ring is 1532. One has to allow for the passage of some years in which it was used as a door, after which it became a coffin lid. Then there was the burial. Now the dated door/lid is on display in the Aksaray Museum for the edification of the public.

## 26. Ordu, Ünye, İkizce, Eski Cami 1522vv and earlier

The Old Mosque at İkizce is an oaken box, surrounded on three sides by a wide porch, altogether humble in appearance. We noted at the time of collection that a number of timbers were reused, some probably more than once, and we were prepared for a discrepancy in end dates. A 52-year-old informant said that his 112-year-old grandmother had told him the mosque was in its present form in her time. (The longevity of Black Sea grandmothers seems to be remarkable.) No sapwood was present on any of the samples. The end-dates for the mosque timbers are spread out over 127 years as follows: 1522, 1495,



**Figure 4.12.** Ordu, Ünye, İkizce, Eski Cami, exterior. Timbers have last preserved rings dating from 1395 to 1522. (P. I. Kuniholm, ADP)



**Figure 4.13.** Ordu, Ünye, İkizce, Eske Cami, detail of northeast corner. Reused timbers with end dates spread out over 127 years from 1395 to 1522. (P. I. Kuniholm, ADP)

1487, 1478, 1462, 1454, 1453, 1437, 1427, 1416, 1395 (almost as bewildering as Foça, Kaleburnu, above). With a full sapwood allowance a mid-16th century or slightly later date is reasonable. The mosque is indeed *Eski*, and Grandmother was right.

## 27. Corinth, Acrocorinth, Unnamed Mosque 1508vv

In 1995 a whirlwind visit to Medieval Acrocorinth with its excavators Richard Rothaus and Tim Gregory yielded a bag of samples, some of which are definitely Ottoman and therefore relevant to this chapter. From oak stretchers within the walls of an unnamed and hitherto undated mosque we have 1508vv. The fundamental publication is Carpenter and Bon (1932) where their estimate for the date of the mosque is simply 'Post-Venetian.' Perhaps the researchers in the Ottoman Archives can point us toward a name for it.

## 28. Çanakkale, Kilid ul-Bahir Kalesi 1462B

In the center of a huge trilobe fortification at the narrows of the Dardanelles is a seven-story triangular keep (Ayverdi IV, 1974:

790–804), the oaken joists of which have in large part been cut away, leaving the stumps immured where they are pinned into the masonry. A set of samples was chainsawed from the two lower registers. All were cut in 1462, the same year cited by Ayverdi (IV, 1974:790) who says Kapudan-i Deryâ Ya'kub Bey caused it to be built in H.866–867.

**29. Trikala, Kurşun Camii****1453vv (many rings lost to rot)**

The Kurşun Camii, also known as Hg. Konstandinos, is Sinan's westernmost building and is dated 1550 by inscription. From the west porch we collected a number of badly rotted stretchers and for years tried in vain to fit them in with oak ring-sequences collected nearby from the monasteries at Meteora or the Metropolitan Church at Kalambaka. By contrast, the fits with wood from Serres are splendid. Even though the ring-sequence from the Kurşun Camii is short, I am confident that we have a last-preserved ring at 1453. A good question is why Sinan's carpenters felt the need to bring wood all the way to Trikala from Thrace.

**30. Didymoteichon, I. Mehmet Camii      1419v (primary)  
and 1439B (repair)**

This imperial mosque in Didymoteichon (Dimetoka), known locally as the Vayazit Dzami because the name Beyazit appears in the inscription, was built in H.824 (A.D.1420/1421) by Sultan Mehmet I. From niches in the west wall of the building we collected timbers with a last-preserved ring of 1419 and therefore primary. The pyramidal lead roof, clearly not the original which collapsed (Ayverdi II, 1972, Figs. 219 and 225 for a reconstruction of the original two-domed layout), is supported on enormous oak beams (some as large as 0.97 m. × 0.67 m.), all of which were cut in 1439 and are not to be confused with the 17th-century veneer of planking which hides them from the viewer below (plans and sections in Ayverdi II, 1972:136ff.).

**31. Akşehir, Nasreddin Hoca Türbesi      1438vv and ????**

In Akşehir six oak tie-beams surrounding the mausoleum (*türbe*) of Nasreddin Hoca and connecting six plain columns, which support a conical cap to the türbe, form an inner hexagonal peristyle around the tomb of the Hoca (Çetinor 1987). In the opinion of the Akşehir Museum

Director, Mr. Ali Meriç, the tie-beams are from an intermediate repair or renovation after a destruction of the tomb some time between the Hoca's death in the late thirteenth century (1284?) and 1905 when a drastic restoration was made to the türbe—including the addition of a marble veneer which removed much of the charm still visible in nineteenth-century photographs—and from which the türbe takes much of its present shape. An inscription on one side of the türbe reads H.1324 (A.D.1906.)

When the flooring around the catafalque was pulled up during the 1905 renovations, two unexpected additional tombs appeared: one of a daughter of Sultan II. Mehmet the Conqueror from the midfifteenth century or slightly later, and one other. These have been restored and are in place to the south and east of the Hoca's tomb inside the inner peristyle. Neither the shafts of the columns, which are simple cylinders, nor the caps, which are undecorated tetrahedrons, are diagnostic of any architectural style or period. The columns could be as old as Roman, and at least one had a previous use in which a door or window was inserted in a long vertical cut running the length of the column. The inner peristyle does, however, look older than the rest of the adornment, and there is a graffito on one column, says Mr. Meriç, dated A.D.1394.

No sapwood is present on any timber. The trees show an extraordinary amount of stress (average ring-width is around 30/100 to 40/100 mm.), and no two pieces crossdate with one another, even though all but one have over 100 annual rings preserved, and all ought to be part of the same constructional program. Since the columns are only 1.81 m. apart, measuring from center to center, it is reasonable to suppose that two or more of these rather short tie-beams could have come from the same tree, but given the lack of resemblance from core to core this seems highly unlikely. Given an almost perfect dendrochronological situation, i.e., six oak timbers with well over 100 rings each, it is irritating that only one piece can be crossdated—and that at 1438vv (plus an allowance for missing sapwood on the exterior)—with any components of the Aegean oak master chronology which runs from A.D.360 to present. The midfifteenth-century date might mean that the türbe was refurbished at the time of the death of Sultan Mehmet's daughter. As usual, the Hoca has had the last laugh.

### 32. Afyon, Demirtaşpaşazade Umur Bey Camii 1434vv

Four column sections, all *Pinus* sp., with stalactite caps, said to be from the Demirtaşpaşazade Umur Bey Camii located in what is

now the Youth Park [near the Alaca Hamam?] and which burned down in 1934, are to be found in the courtyard of the Archaeological Museum in Afyon. The inscriptional dates are three—two stone *vakfiyeler* and a *kadi sicili* in Bursa—so that one may choose H.843 (A.D.1440) or H.859 (A.D.1454) or H.865 (A.D.1461) (Ayverdi III, 1973, 211ff., and see his plan on p. 212). Two full cross-sections were sawn from these columns (Ayverdi III, p. 17, Fig. 29, and p. 18, Fig. 30, for photographs). The remaining two samples were not collected because of large, complacent rings and rot. Some shaping has removed a number of rings which accounts for the discrepancy of 6 to 27 years between the last preserved ring on AFD-4 and the inscriptional date(s).

### 33. Bursa, Yeşil Cami

1413v

This imperial monument was completed in 1419–1420 (Ayverdi II, 1972, 46–94; Kuran, 1968, 114–119; Restle, 1976, 459–466; Gabriel, 1958; Yetkin, 1965, 225ff., and for comment on the inscription: Mayer, 1956, 75).

Oak samples were cored from tie-beams in two bays immediately flanking the entrance bay where they support spolia columns with



**Figure 4.14.** Bursa, Yeşil Camii, alcove next to the front door. The beams have a last-preserved ring from 1413. (P. I. Kuniholm, ADP)

Corinthian capitals. Although the last preserved ring is 1413vv, sapwood begins as early as 1398, and our usual allowance for sapwood of 26 years  $\pm$  9 makes the estimated dendrochronological date of A.D.1415–1433 fit in well with the inscriptional construction date of H.822 (A.D.1419/1420).

### 34. Bursa, I. Yıldırım Beyazıt Darüşşifası 1400B

This hospital/asylum built and endowed by Sultan Iıldırım Beyazıt was ruined in the earthquake of 1855, was later used for a powder magazine, and is now undergoing an unhappy restoration. The ensemble covers an area of 30 × 53 meters. Along the façades of the courtyard on three sides is a portico giving access to rooms about 3 × 4 meters each, each provided with a chimney, presumably for the patients and inmates. On the south and north larger spaces were presumably for dining, cooking, and for the work of the medical staff. Toilets were installed in the northeast corner (running water a century



**Figure 4.15.** Bursa, I. Yıldırım Beyazıt Darüşşifası, with timbers cut in 1400. Cubicles for the patients are ranged left and right. The foundations of the interior arcade carried pipes for running water. (P. I. Kuniholm, ADP)



Figure 4.16. Bursa, I. Yıldırım Beyazıt Darüşşifası, detail of south end with timbers cut in 1400. (P. I. Kuniholm, ADP)

before Columbus!). These latrines were supplied with water by an underground canal which passed under the eastern wing of the construction.

According to the unpublished foundation document or *vakfiye* of H.802 (A.D.1399/1400), three doctors and two pharmacists were attached to the establishment. The text fixes their daily pay as well as the salary of the service personnel including a cook, a baker, and a dozen *şerbetçi* (literally sherbet-sellers, but probably male nurses). It indicates as well how the sick were to be fed and notes how the building is to be maintained and provided with the necessary revenues or donations for operation. See Ünsal (1959, 40 and Figs. 15–17) where he writes, 'The earliest medrese at Bursa is that of Yıldırım (1394): its Şifaiye is also the first Ottoman mental hospital.' (His source for this date is unclear to me.)

Further comment is in Godfrey Goodwin (1971, 47–51, and his refs. 78–82). See Fig. 42 for a plan of the complex. See also Albert Gabriel (1958, 76–77, Fig. 32). Pages 76–77 provide a combination recapitulation of the foundation document's text and a description of a long-lost bucolic Bursa (and see Gabriel's photographs). For readers

wishing further discussion on the *vakfiye*, see Ayverdi I (1966, 454) and Kuran (1968, 17–18).

Although Gabriel gives the building date as ‘between 1391 and 1395,’ the oak timbers in this hospital were cut in 1400, the same year as the date of the *vakfiye*. Although, no doubt, later repairs were made to the monument, none can be attested dendrochronologically. Interestingly, the dendrochronological profile for this building is so similar to that of the Yeşil Cami, also a foundation of Yıldırım Beyazit, that I believe the trees must have been cut from the same part of the same forest.

### **35. Bursa, I. Murat Hüdavendigâr Camii      1385v**

In the gallery over the porch of this imperial mosque, tie-beams were drilled from five arched bays from east to west along the north facade and their responds to the north exterior wall of the mosque. Ayverdi (I, 1966, 232) discusses some of the complexities of interpreting the *vakfiye*. The mosque’s building was authorized as early as A.D.1364/1365 upon the occasion of the circumcision of Sultan Murat’s son, but work was not completed until 1385. The wood of the gallery tie-beams and elsewhere in the second story was not cut until 1385, suggesting that work on this mosque really did not begin until 1385.

### **36. Kastamonu, Kasabaköy, Mahmut Bey Camii      1366v**

Shortly before our visit to Kasabaköy in 1990, the floor of this wooden mosque with ornate all-wooden interior decoration was taken up and replaced. We did not wish to interfere with any of the decorated parts of the monument, so our sampling was confined to the floor substructure. Under the planking were large parallel pine logs lying directly on the soil and adzed on only the top side where they were in contact with the boards. The imam had saved a couple of these timbers and planks from which he kindly permitted us to take sections. He also read out the inscription as H.768 (A.D.1366/1367) which is the same as our dendrochronological date (see also Bilici 1988:89 and n. 36). This handsome building (not in Ayverdi) was recently illustrated by Faruk Pekin (July 1997) and there given, without explanation, a date of 1374.

### **37. Tokat, Gök Medrese      1303vv**

An oak tie-beam collected from the inner arcade of the Gök Medrese, now the Archaeological Museum, has a last-preserved ring

at 1303. Kuran (1969:96ff.) suggests a date slightly later than Gabriel's proposed 'near 1275.'

### 38. Afyon, Ulu Cami

1273v

Three column sections with stalactite caps, said to be from the Ulu Cami and replaced during earlier activities of the Vakiflar Anıtlar Şubesi, are to be found in the courtyard of the Archaeological Museum in Afyon. One was too rotten to try cutting, but two full cross-sections were sawn from the others. All are *Pinus* sp. AFY-2 has a terminal ring in 1273. The inscriptional date of the mosque (actually, on the minber) is H.671 (A.D.1272/73) according to Ünsal (1959:16). The building is thought to have been rebuilt in 1341. See also Sabih Erken (1983:94–100). The remaining section, AFY-1, is too erratic to be dated, and looks good neither anywhere near 1273 nor 1341 (photographs of these caps in Ayverdi III:17, Fig. 29, and III:18, Fig. 30).

### 39. Afyon, Çay, Yusuf bin Yakub Medresesi

1268B

The modern sign on the front door of the medrese, today a functioning mosque (although also called locally the Taş Medrese), says A.D.1258. Aptullah Kuran (1969:57–59) gives the date as H.677 (A.D.1278). He does not provide documentation for the inscription or its reading. The dendrochronological date of A.D.1268 or H.667 (see below) suggests that a 6 in the decades column might have been read as a 7. Our file photographs of the inscription do not help because a tree is in the way, and the photograph in Ötüken *et al.*, (1983:159) is not much better.

The building is reminiscent of the İnce Minareli Medrese and Karatay Medrese in Konya, among others, both in general form and in the tile decoration, only a portion of which remains. Fourteen bays surround the central domed hall, originally provided with a reflecting pool. The *iwan* on the southeast is equipped with a prayer niche, leaving no doubt as to its original intended purpose. Small cubicles on northeast and southwest were probably student rooms. As Kuran's plan shows, six of the partition walls have been removed, thereby giving the visitor the illusion that the central hall, now the prayer hall, was always flanked by two barrel-vaulted aisles.

We examined 14 bays running around the interior of the entire building as well as an additional space to the northwest, a



**Figure 4.17.** Afyon, Çay, Yusuf bin Yakub Medresesi, portal. Neither the date nor the name on the modern sign is to be believed. The dendrochronological date is 1268. (P. I. Kuniholm, ADP)

two-windowed room with elegant stone lintels, possibly the *hoca's* room in the middle ages as well as now (also called the 'guest-room' or *misafir odası*), at the top of a flight of steps to the base of the minaret.

Of the fourteen openings to the central hall eleven have oak lintel systems preserved. Each lintel had an average of five beams, most of them adzed flat on top and bottom, thereby enabling us to drill along radii where few, if any, rings were missing. In only one bay has the lintel been completely removed. The *iwan* and the entrance hall were never thus equipped, although there is a lintel beam above the front

door to the entrance hall. A final lintel is over the door at the head of the stairs. A total of 51 surviving lintel beams were counted, and increment cores were taken from 46. The lintels are all at a height of about two meters above the floor and form a chain around most of the central hall. They must have been integral to the original construction of the building. All were cut in 1268 or have last-preserved rings just before 1268.

A summary of the epigraphical history of the building seems to be as follows:

1. The earliest western visitors noted the lack of a date on the inscription above the medrese's door.
2. They did notice a date of 1278 on the kervansaray or han across the street.
3. Somewhere along the line the inscriptional date for the han appears to have gotten copied into somebody's notebook as the date for the medrese.
4. This has been dutifully repeated by everybody ever since except by the current staff of the medrese who have put 1258 on a plywood sign next to the front door and renamed the building the Sultan Alaâddin Camii.

#### **40a. Konya, İnce Minareli Medrese, Primary      1259vv**

Cores taken from the top of the unbonded east-west wall of poorly dressed masonry between medrese proper and minaret, shown in Kur'an's plan as primary, but which at the time of our visit we thought could have been a later insertion, crossdate well with other thirteenth-century junipers with the last preserved ring at 1259. The date of the *vakfiye* is H.679 (A.D.1280), but the medrese is supposed to have been built under the Vezier Fahreddin Ali Sahibata between 1258–1279 (Kuran 1969:54–55).

#### **40b. Konya, İnce Minareli Medrese, Secondary Substructure      1549vv**

Just under the south wall of the medrese is an east-west barrel-vaulted, subterranean chamber about 3 meters below grade. Six vertical shafts on the north side are now exposed about a meter south of the medrese's south wall. The chamber's existence was unsuspected until early in 1994, when it was broken into on the east end of the

vault. Only then were the steps up on the south side discovered and most of the lintel beams discarded and replaced. We sawed an end off the one remaining northernmost juniper lintel beam. The last preserved ring (no sapwood) is 1548 with an unknown number of rings missing from the exterior. The subterranean chamber, then, has nothing to do with the primary construction of the medrese although the north wall does line up with the south wall of the medrese.

#### 41a. Akşehir, Taş Medrese Camii, Kadınlar Mahfili 1251v

Nine oak samples were taken from a chain-beam system running around the interior of the mosque at about waist height, half-way between the gallery and an ornamental tile band at the base of the dome. On each wall two or three stretchers, scarf-joined to each other, are supported by four notched headers at regular intervals which run through the thickness of each wall. The inscription over the front gate to the *medrese* proper says it was repaired in H.648



**Figure 4.18.** Akşehir, Taş Medrese. Tie-beams are from the 1251 repairs to the medrese. (P. I. Kuniholm, ADP)

(A.D.1250/1251). The last preserved oak ring in the *kadınlar mahfili* is also 1251, so it would appear that this part of the mosque is part of the renovations.

**41b. Ground Floor, Door to Minaret, Lintel:** 1251v

This is part of the same construction as the *kadınlar mahfili*.

**41c. Medrese Colonnade and Student Cubicles  
(Unknown Number of Rings Missing)** 1197vv

The sample, a squared juniper tie-beam from the arcade, has a last-preserved ring at 1197, but we are unable to determine how many rings were removed in the process of squaring it. Two fingers' thickness of wood missing from the exterior of the timber would add up to about 50 rings and therefore would enable us to link this to the 1251 renovations, but this is only guesswork on our part.

**42. Konya, Sahipata Mescidi =  
Konya, Tahir ile Zühre Mescidi** 1233vv

Two fragmented samples collected from the north entrance door to the main room by the ODTÜ Architectural Faculty's restoration team were given to us with an estimated date of 1250±, although their source of information was not specified. The date for the mescid in Kur'an (1969:63) is A.H.678 (A.D.1279).

**43. Beyşehir, Kubadabad Sarayı  
(Sultan Alaeddin Keykubad)** 1231B

Thirteen juniper pilings from the north end of this building, next to the sandy gravel of the shore of Beyşehir Lake, excavated by Professor Dr. Rüçhan Arık (1986), and earlier investigated by Katharina Otto-Dorn and Mehmet Önder (1966, 1967), were all cut in 1231 during the lifetime of Sultan Alaeddin Keykubad (1220–1236) whose summer palace the Kubadabad Sarayı is supposed to have been.

**44. Sivas, Şifaiye Medresesi  
(İzzeddine Keykâvûş)** 1215v

The inscriptional date is H.614 (A.D.1217), so a dendrochronological date of 1215 from the courtyard wall next to the entrance suggests

we have part of the primary construction (Kuran, 1969:67, 99–104, plan p. 103, section p. 109).

**45. Samsun, Çarşamba,  
Yaycılar Camii**

**1204B, 1205B, 1211vv (repair?)**

This is an oak box-like structure, smaller than almost anything on this list except perhaps for some of the small Black Sea mosques in #1 above. I am not aware of any published report on this building. None of the four *imams* (the mosque serves four villages) knows of any record that might shed light on its history. On the east door of the *son cemaat yeri* is written in pencil ‘Miladi [A.D.] 1243’ in Latin script (therefore since the Turkish Revolution) by an unknown writer. There is no *Hicri* or *Rumi* date.

Two of the primary timbers were cut in 1204 and 1205 respectively, thereby preceding the traditional advent of the Turks to the area by one or two years. The 1211vv timber (plus an allowance for missing sapwood) ought to have been cut around 1237 (or a few years later), some 31 years after the Turks arrived. The question is: does this last timber date from a later building phase, or is it a repair, or is the pencilled date for some improbable reason correct?

**46. Afyon, Sincanlı, Boyalıköy Medresesi**

**1206B**

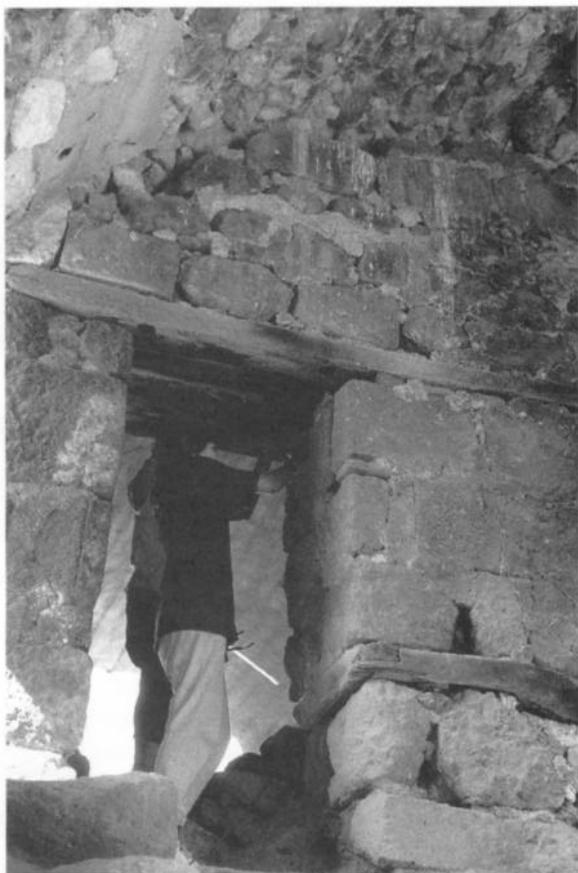
The medrese at Boyalıköy is in Kuran’s ‘Kapalı-Avlu’ class. Estimates of its date range from as early as late eleventh century, to ‘before [or around] 1224’, to very early in the thirteenth century (Kuran, 1969, 44–46; Ötüken *et al.*, 1983, 150–155). A neighboring *türbe* has an inscriptional date of 1210, and it seemed reasonable to suppose that the date of the medrese could be from that approximate time. Because of the assortment of proposed dates we collected cores from all 37 oak timbers in the medrese. The bark date for this building is 1206 or four years before the date of the *türbe*.



**Figure 4.19.** Afyon, Sincanlı, Boyaliköy Medresesi, exterior. The dendrochronological date for the medrese is 1206. The inscriptional date for the türbe in the background is 1210. (P. I. Kuniholm, ADP)



**Figure 4.20.** Afyon, Sincanlı, Boyaliköy Medresesi, interior. The oak tie-beams, wall-stretchers, and door-lintels were cut in 1206. The “beam” in the foreground is a poured concrete replacement. (P. I. Kuniholm, ADP)



**Figure 4.21.** Afyon, Sincanlı, Boyalıköy Medresesi, second-story door lintel. All the oak lintel-beams were cut in 1206. (P. I. Kuniholm, ADP)

**47a. Samsun, Çarşamba, Mezarlık (Gökçeli)  
Camii, Primary Phase**

**1206B**

**47b. Samsun, Çarşamba, Mezarlık (Gökçeli)  
Camii, Revak (Porch)**

**1335v**

The large wooden mosque in the east graveyard at Çarşamba was sampled in 1991 at the request of the Samsun Vakıflar Bölge Müdürü. The fundamental publication which we did not see until several years later is by H. H. Günhan Danışman (1986, 135–144, Plates 87–95, and

see below). All we had upon our arrival was information from Hüseyin Özosma, İmam Hatip, Çarşamba Mezar İçi, 'Bu cami tahmini olarak Rumi 592 [= A.D.1176] tarihinde yapılmıştır.' He did not amplify on the source for his *tahmin*.

The mosque is a barn-sized log cabin or rectangular wooden box of oak (locally known as *pelit*) with the mosque divided from the *son cemaat yeri* by a crosswall with its ends notched into the east-west long walls. On north, east, and west some trimming of the ends has been done, but on the south the ends of the long walls project in random fashion up to a meter beyond the corners. An unusual 'truss' (which seems to have little or no structural function) runs north-south, dividing the mosque in two. The size of the boards in the mosque is impressive, typically 0.55 m. × 0.15 m. × 13.06 m. for all the exterior members of the walls of the mosque and revak. The size of the trees exploited was equally impressive. Since most boards are sawn or split radial sections of large trees, as can be readily seen on the four corners of the mosque and on the cross-wall, the original tree diameter was often over one meter. Oaks like this are almost impossible to find in Turkey today.

The hip roof slopes down on west, north, and east to a porch which runs around three sides of the mosque. The rafters of the porch continue the line of the roof. Several appear to be later additions to the original construction.

From the mosque proper a terminal ring of 1206 is preserved. The wood was cut after the end of the growing season of 1206 and before the beginning of the growing season of 1207 and, on the basis of standard Turkish carpentry practice, presumably used immediately thereafter. We were unable to find other pieces with the full sapwood preserved, so additional sampling would not have taught us much.

All the timbers (rafters) we sampled from the north and west porch were cut in 1335 or at the latest a year or two thereafter. Another look at the mosque in 1992 confirmed that the 1335 porch is simply a repair of an earlier porch construction. Cuttings show clearly where the earlier porch adjoined the mosque walls. Not one of the eight dated porch rafters is early.

Danişman speculates on the date of the mosque and proposes a date in the 1100's on the basis of one tombstone, the reading of which was disputed at the time, and which can no longer be found. (This was possibly the foundation for the İmam Hatip's claim mentioned above.) His interpretation poses a problem since the Turks did not arrive on

the Black Sea coast until 1206 when I. Giyasettin Keyhüsrev opened the trade route from the Anatolian interior. How, in other words, could we have a Turkish mosque in Çarşamba when there were no Turks there? The dendrochronological date of 1206 for the construction of the mosque coincides neatly with this historical event.

**48. Konya, Selçuklu Sarayı (II. Sultan Kılıçarslan)**

**1174v**

In 1994 we collected four headers from the south face of the sub-structure of Sultan Kılıçarslan II's 'kiosk' in Konya. Upper-story



**Figure 4.22.** Konya, Selçuklu Sarayı. Lower portion of the tower. Last preserved ring is 1174. (P. I. Kuniholm, ADP)



**Figure 4.23.** Konya, Selçuklu Sarayı. Another view at the lower portion of the tower. Last preserved ring is 1174. (P. I. Kuniholm, ADP)

timbers just under the modern concrete parasol which protects the structure from the elements were judged to be too unstable for sampling. Since we have last-preserved rings of 1174 and 1173 on two of our three datable pieces, both untrimmed, and 1167 on the third with a few rings missing, we think the construction date must follow closely upon 1174, right in the middle of Sultan Kılıçarslan II's reign (1156–1192; see Aslanapa 1990:299–301 and Figs. 291 and 291a; Kuran 1965:155ff.). The photograph in the latter shows the state of the tower when its upper story was still extant, i.e., when it was twice as tall as it is today.

#### ACKNOWLEDGMENTS

The Malcolm and Carolyn Wiener Laboratory for Aegean and Near Eastern Dendrochronology is supported by the National Endowment for the Humanities, the National Science Foundation, the Malcolm H. Wiener Foundation, the National Geographic Society, the Samuel H. Kress Foundation, the Wenner-Gren Foundation for Anthropological

Research, and individual Patrons of the Aegean Dendrochronology Project. From 1973 to 1976 this project was supported by the American Research Institute in Turkey, and from 1976 to the present it has been supported by Cornell University. For fundamental permissions we thank the responsible authorities, both civil and religious, in the countries where we have collected specimens. We also thank the excavators of each site who kindly provided both material and discussion of the problems of each excavation.

## REFERENCES

- Arel, A.
- 1993 About the 'Hasan Paşa Tower' at Yerkesiği, on the Plain of Troia. *Studia Troica* 3:173–189.
- Arik, R.
- 1986 Kubadabad 1985 yıl çalışmalar. *Kazı Sonuçları Toplantısı*. Vol 8, No. 2, Anıtlar ve Müzeler Genel Müdürlüğü, Ankara. pp. 303–314
- Aslanapa, O.
- 1990 Anadolu'da Selçuklu Saray ve Köşkleri. *Türk Sanatı*.
- Ayverdi, E. H.
- 1982 *Avrupa'da Osmanlı Mimâri Eserleri: Bulgaristan, Yunanistan, Arnavudluk*. Vol. IV, Books 4–6, İstanbul Fetih Cemiyeti.
  - 1989a *Osmanlı Mi'mârisinin İlk Devri: Ertuğrul, Osman, Orhan Gaaziler, Hüdavendigâr, ve Yıldırım Bayezid*, [H.] 630–805 (1230–1402). Vol. I. İstanbul Mi'mâri Çağının Menşei'i. İstanbul Fetih Cemiyeti, İstanbul Enstitüsü No. 57. Damla Ofset-İstanbul. [First printing 1966].
  - 1989b *Osmanlı Mi'mârisinde: Çelebi ve II. Sultan Murad Devri*, [H.] 806–855 (1403–1451). Vol.II, İstanbul Fetih Cemiyeti, İstanbul Enstitüsü No. 65. Damla Ofset-İstanbul. [First printing 1972].
  - 1989c *Osmanlı Mi'mârisinde: Fâtih Devri* [H.] 855–886 (1451–1481). Vol. III. İstanbul Fetih Cemiyeti, İstanbul Enstitüsü No. 69. Damla Ofset-İstanbul. [First printing 1973]. (Afyon-İstanbul).
  - 1989d *Osmanlı Mi'mârisinde Fâtih Devri* [H.] 855–886 (1451–1481). Vol. IV. İstanbul Fetih Cemiyeti, İstanbul Enstitüsü No. 69. Damla Ofset-İstanbul. [First printing 1974]. (İstanbul-Zile).
- Ayverdi, E. H., A. Yüksel, G. Ertürk, and İ. Numan
- 1980 *Avrupa'da Osmanlı Mimâri Eserleri: Romanya, Macaristan*. Vol. I, Books 1 & 2, İstanbul Fetih Cemiyeti.
  - 1981a *Avrupa'da Osmanlı Mimâri Eserleri: Yugoslavya*. Vol. II, Book 3, İstanbul Fetih Cemiyeti.
  - 1981b *Avrupa'da Osmanlı Mimâri Eserleri: Yugoslavya*. Vol. III, Book 3, İstanbul Fetih Cemiyeti.
- Bilici, Z. K.
- 1988 Kastamonu ve Kasabaköy'deki İki Eseriyle Nakkaş Abdullah Bin Mahmud ve Sanat Tarihimizdeki Yeri. *Vakitlar Dergisi* XX:85–94.
- Carpenter, R. and A. Bon
- 1932 *Corinth III, Part III: The Defenses of Acrocorinth and the Lower Town*. American School of Classical Studies, Cambridge.

- Çetinor, B.
- 1987 Nasrettin Hoca ve Türbesi. *İlgı* 49, İlkbahar:13–17.
- Danışman, H.H.G.
- 1986 Samsun Yöresi Ahşap Mimarisinin Gelenekseli-Bafra, İkiztepe Arkeolojik Verilerinin Işığında Çarşamba, Gökçeli Camının İncelenmesi. *IX. Türk Tarih Kongres*, Ankara. pp. 135–144, Plates 87–95.
- Erken, S.
- 1983 *Türkiye'de Vakıf Abideler ve Eski Eserler I*. Ankara. pp. 94–100.
- Gabriel, A.
- 1958 *Une capitale turque: Brousse*. Paris.
- Goodwin, G.
- 1971 *A History of Ottoman Architecture*. Johns Hopkins Press, Baltimore.
- Karpuz, H.
- 1990 Trabzon'un Çaykara İlçesi Köylerinde Bulunan Bazı Camiler. *Vakıflar Dergisi* XXI: 281–298.
- Kuban, D.
- 1965 *Anadolu—Türk Mimarisinin Kaynak ve Sorunları*. İTÜ Mimarlık Fakültesi, İstanbul.
- Kuniholm, P. I.
- 1995 Dendrochronology, In Science in Archaeology: A Review. *American Journal of Archaeology*. Patrick J. McGovern, et al. 99:1:79–142.
- Kuniholm, P. I. and C. L. Striker
- 1983 Dendrochronological Investigations in the Aegean and Neighboring Regions, 1977–1982. *Journal of Field Archaeology* 10:4:413–420.
- 1987 Dendrochronological Investigations in the Aegean and Neighboring Regions, 1983–1986. *Journal of Field Archaeology* 14:4:385–398.
- Kuniholm, P. I.
- 1996 Long Tree-Ring Chronologies for the Eastern Mediterranean. In *Archaeometry '94: The Proceedings of the 29th International Symposium on Archaeometry*. Ş. Demirci, A. M. Özer, and G. D. Summers, (eds.). TÜBİTAK, Ankara. pp. 401–409.
- Kuran, A.
- 1969 *Anadolu Medreseleri*, I. Cilt. Orta Doğu Teknik Üniversitesi, Mimarlık Fakültesi, Ankara.
- 1968 *The Mosque in Early Ottoman Architecture*. University of Chicago Press, Chicago.
- Lightfoot, C.
- 1994 Amorium Excavations 1993: The Sixth Preliminary Report. *Anatolian Studies* XLIV:105–126, Plates XVII–XXIV.
- Mayer, L. A.
- 1956 *Islamic Architects and Their Works*. Albert Kundig, Geneva.
- Otto-Dorn, K.
- 1941 Das Islamische Iznik. *Ist.Forsch.* 13.
- 1967 Bericht über die Grabungen in Kobadabad. *Archäologischer Anzeiger*. pp. 438–506.
- Otto-Dorn, K. and M.
- 1966 Bericht über die Grabungen in Kobadabad. *Archäologischer Anzeiger*. October, pp. 170–183.
- Önge, Y., İ. Ateş, and S. Bayram
- 1978 *Divriği Ulu Camii ve Darüşşifası*. Vakıflar Genel Müdürlüğü Yayınları, Ankara.
- Ötüken, S.Y., A. Durukan, H. Acun, and S. Pekak
- 1986 *Türkiye'de Vakıf Abideler ve Eski Eserler*. IV, Ankara.

- Pekin, F.
- 1997 Wooden Mosques of the Black Sea Region. *Skylife*. July. Türk Hava Yolları, Istanbul. pp. 45–56.
- Pulak, C.
- 1983 1982 Yassiada Sultani Kazısı. V. *Kazi Sonuçları Toplantısı*. Ankara.
  - 1984a The Sixteenth-Century Ottoman Wreck. *Institute of Nautical Archaeology (INA) Newsletter*, Winter, 10:4:10–15.
  - 1984b Yassiada Sultani Kazısı, 1983 Sezonu. VI. *Kazi Sonuçları Toplantısı*. Ankara.
  - 1984–85 “Sixteenth-century Ottoman Wreck: One of the Three Ships Trapped by Perilous Yassi Ada Coast” *Institute of Nautical Archaeology (INA) Newsletter*, 11(4):10–15.
- Restle, M.
- 1976 *Istanbul, Bursa, Edirne, Iznik: Baudenkmäler und Museen*. P. Reclam, Stuttgart.
- Rogers, J. M.
- 1965 The Çifte Minare Medrese at Erzurum and the Gök Medrese at Sivas. *Anatolian Studies* XV:63–85.
- Ünsal, B.
- 1959 *Turkish Islamic Architecture in Seljuk and Ottoman Times 1071–1923*. Tiranti, London.
- Vakıflar Genel Müdürlüğü
- 1983 *Türkiye'de Vakıf Abideler ve Eski Eserler*. Vol. I (Adana to Artvin), 2nd ed., with additions. Ankara.
- Yetkin, S. K.
- 1965 *İslâm Mimarisi*. Ankara Univ. İslâhiyat Fakültesi. Türk ve İslâm Sanatları Tarihi Enstitüsü, Ankara. No. 61.
- Yüksel, I. A.
- 1983 *Osmanlı Mi'mârsinde: II. Bayezid Yavuz Selim Devri* ([H.] 886–926/1481–1520). Vol. V. İstanbul Fetih Cemiyeti. [completes the series begun by Ekrem Hakkı Ayverdi].