

Aegean Dendrochronology Project December 1990 Progress Report

"The chronology of every country in ancient Western Asia bristles with problems."

---*W.C. Hayes, Cambridge Ancient History I.1, (1970)*

"...one should at last be able to settle a further problem that has bedevilled the historical chronologies over the past 40 years, namely, the existence of three main versions, high, middle, and low chronologies, in both Egypt and Mesopotamia. Between the two extremes, the middle chronology is now the favourite, but as it represents a compromise, it is not necessarily therefore correct. The chaos caused by six historical chronologies, and three radiocarbon ones (uncorrected with 5568 half life, uncorrected with 5570 half life and the corrected one, which should henceforth be solely used), has made a synthesis of Near Eastern (*grosso modo*, including Egypt, Middle East, and Indus valley) cultural development almost impossible, or, at best, so fraught with chronological hurdles as to be virtually useless."

---*J. Mellaart Antiquity (1979)*

"However, much of the period of time [with which Kuniholm is] concerned contains well-detailed ceramic chronologies for most questions. Thus the recent end of the tree-ring chronology is of little interest for anthropological archaeology."

---*anonymous NSF Reviewer (1988)*

"Ha! Ha! and, again, Ha!"

---*Peter I. Kuniholm (unpublished) (1990)*

What we have been trying to do about this:

The work of the Aegean Dendrochronology Project has been and continues to be the building of long tree-ring chronologies for the Eastern half of the Mediterranean with the aim of helping to bring some kind of rational order to Aegean and Near Eastern chronology from the Neolithic to the Present. See the summary bargraph of our achievements as of October 1990 on the next page. Since these chronologies are self-standing (i.e., independent of king-lists, generations of potters, etc.), beginning with the tree-rings of the living forests of Turkey, Greece, Yugoslavia, Lebanon, Italy, and Cyprus, extending the sequences back through the rings of timbers collected from medieval monuments, and then continuing as far as the evidence will take us (Chalcolithic, so far, with Neolithic in sight), we feel free from some of the frustrations evident in the first two quotations above and of which the author of the third seems unaware. That is to say, we do not have to take a high, middle or low stance when we begin, and indeed we like to think that we are in a better position to shed light on some of the thornier chronological issues than many of our colleagues.

The event of our year:

In August and September 1989 personnel from the Ankara Museum conducted a rescue excavation in three tumuli at Kizlarkaya, a few kilometers north of Gordion. In one of them, a simple rectangle of juniper slabs formed the grave chamber. Since up to a century of sapwood is missing, our best guess is that the tomb dates from the mid-8th century B.C. But since 911 (!) annual rings are preserved in these slabs, the resulting graph not only crossdates with the long Gordion master chronology but also with the 677 year long Middle Bronze Age chronology published last year in *Studies in Honor of Tahsin Özgüç* which most Patrons received last summer.

Now have a look at a drastically scaled-down version (reduced from 150 inches) on page 4 of the long graph cited in note 4 on the bargraph. At a glance one can see a continuous 1503-year dendrochronological sequence (shown here in two lines) which runs from the mid-23rd century B.C. to

the mid-8th century B.C. (The histogram underneath shows how many rings were included in the graph, some 35,000 in all.) Numbers and comments in the table below show the building years of six major monuments, some which are associated with well-known personages from the Assyrian King List. Other years are associated with pottery and other objects of well-known and studied types or classes. Since the linking of the Bronze Age and Iron Age sequences of this long chronology is only weeks old, we have not had a chance to do more than speculate on the implications for the various other chronologies cited by Mellaart above. At the worst we now have a tenth chronology with which to muddy the waters even further. At the best we may have the beginning of an independent solution for this seemingly intractable problem.

The point is that this 1503-year dendrochronological sequence, lacking for the present a link to the long absolute chronologies of the 2nd millennium A.D. and pinned in place by 18 radiocarbon dates for specifically selected rings, may move up or down a little but not much. The technique by which it was placed is known as wiggle-matching, and a drawing by Bernd Kromer, Heidelberg, of the Gordion radiocarbon dates as they fit the calibrated master radiocarbon curve is also shown below. These results will be submitted for publication later this winter. Thus, for example, if the reader wishes to move ring 730 up a few years to accommodate the high chronology then everything else on the graph must move up an equal number of years. The same applies for moving it down. Our goal is to get to the point where we can move the graph no longer and can get down to the serious business of studying the archaeology and history of the Aegean and the Near East with a time control that has hitherto been lacking.

The Bronze Age/Iron Age chronology, of course, is only one aspect of our effort. Of almost equal interest to many of our friends are the long Medieval/Modern chronologies which include the entire second millennium A.D. and wood from over 100 medieval monuments. What the work of the last dozen years has enabled us to do is to build a wood 'library' by which a number of archaeological, historical, or art-historical problems may be solved and to which other scholars may readily refer. This resource is unique for the Aegean and the Near East.

SUMMER 1990:

Last summer we did our usual 9400 mile trip through the Aegean and Balkans, bringing back some 400 samples from 53 sites. Riding shotgun the whole way were Hope Kuniholm (this year's Lab Boss) and Joan Ramage. Providing an extra pair of hand eastbound was Karen Rubinson and westbound Eleanor Kuniholm.

OLDEST SITE:

Aceramic Neolithic charcoal from Asikli Höyük (about 9000 B.C.)

MOST FAMOUS SITE:

The cleaning of Heinrich Schliemann's Great Trench at Troy yielded an entire dufflebag of Troy I charcoal collected at the end of August, already measured by Carol Griggs (this year's INSTAP fellow), and appearing on the bargraph in the middle of the third millennium B.C. Ten samples from the Troy chronology are already in Heidelberg for wiggle-matching by Herr Kromer.

LONGEST SEQUENCE:

The Gordion-Kizlarkaya tumulus mentioned above with up to 862 rings apiece, measured by mid-September and by the end of the month filling the gap between the Iron Age and Bronze Age chronologies which had plagued us for years. If every period yielded wood of this quality, our lives would be a lot simpler.

ROMAN:

(always a problem because there is usually so little of it): A salvage excavation by the Malatya Museum personnel of a late 1st century A.D. barrel-vaulted tomb near Darende yielded a dozen boards which ought to cover the transition from AD to BC.

LAB WORK:

We have a full crew this year: 11 new students, 5 old-timers (in addition to Hope and Carol: Miles McCredie our programmer, Esra Köseataç our utility infielder, and Joan Ramage who has just finished typing 1200 envelopes for this mailing.) Since dendrochronology is labor-intensive (the bargraph on page 2 is a synthesis of over 7 million ring-measurements), having veterans available to help coach the new talent has resulted in a great saving of time and effort.

PROSPECTS:

As I said at the beginning of this report, I think we are on the verge of having a free-standing, independent means by which to try to resolve the various predicaments that make the study of Aegean and Near Eastern archaeology the chronological quagmire to which both Hayes and Mellaart were alluding. If we can do that, the whole enterprise will have been well worth the effort.

This graph shows how 17 selected decades cut from Gordion MMT wood and then individually radiocarbon dated at Heidelberg fit against the calibrated radiocarbon curve. Only one is an outlier, and then not by very much. The maximum possible error is 37 years \pm . The heavier line in the middle is the mean, and the two lines above and below represent one standard deviation from the mean. Thus the slight wiggle left or right is theoretically possible.

The entire 1503 year tree-ring chronology is therefore wiggle-matched. It begins in 2259 B.C. ± 37 with the oldest ring at Kültepe's Warsama Sarayi and ends in 757 B.C. ± 37 with the last ring in the Midas Mound Tumulus at Gordion.

Collecting Statistics for Summer 1990

YUGOSLAVIA

Slavonski Pozega	3
Sisak (Celtic), = Segestica	13
Sevnica, Ajdovski Gradec	19
Slovenia, Vrhnika	5
Slovenia, Murska Sobota, Lendava	1
Ljubljanski Grad	1
Dubrovnik, Onofrije Fountain	4
Sisak, Roman Settlement (East)	10

TURKEY

Claros (pre-Orientalizing)	5
iznik, Walls	5
Gordion, Kizlarkaya A Tumulus	5
Gordion Midas Mound Tumulus	1
Amasya, Gümüs, Darphane Camii	8
Kastamonou, Kasabaköy, Mahmut Bey	2
Sinop, Boyabat Castle	5
Sinop, Balatlar Kilise	6
Sinop, City Walls	4
Sinop, Göktepe, Daztepe Mevkisi	9
Sinop, Soyuk, Findiklidüz Mevkii	8
Samsun, Bafra, İkiztepe	1
Kizilirmak Riverbed	1
Samsun, Terme, Merkez Pazar Camii	3

Samsun, Çarsamba, Mezarlik Camii	14
Ordu, Melet Irmagi (Riverbed)	1
Giresun, Shipwreck	2
Trabzon, Torul İ̇sletmesi, various	11
Bayburt, Demirözü Çiftetas, Büyüktepe	1
Erzurum, Çifte Minareli Medrese	2
Elazig, Harput, Ulu Camii	2
Elazig, Mollakendi, IV. Murat Camii	5
Elazig, Keban Dam (Euphrates River)	1
Elazig, Eti Bank Mine explorations	1
Malatya, Arslantepe	2
Malatya, Darende, Yenice Tumulus	12
Adiyaman, Tille Höyük	24
Urfa, Harran Camii	1
Batman, Hasankeyf, Ulu Camii	1
Batman, Hasankeyf, Koç Camii	2
Van, Gevas	3
Van, Ayanis	42
Van, Kale, Süleyman Han Camii (bag)	1
Van, Kale, Kule Girisi	1
Van, Dilkaya	3
Nigde, Çamardi, Göltepe (more soon)	1
Aksaray, Asikli Höyük (more coming)	4
Konya, Karahöyük	13
Konya, Beysehir, Kubadabat Sarayi	14
Çanakkale, Troy I	est.100
Çanakkale, Scamander Riverbed	1
Bursa, Ilipinar (ident.only)	6
<u>SYRIA</u>	
Tell Brak	3
Ugarit (coming)	0
<u>TOTAL</u>	
	367++

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