

AEGEAN DENDROCHRONOLOGY PROJECT

DECEMBER 1991 ANNUAL REPORT

1991 was a good year for tying together loose ends. You will remember that last year we announced the joining together of the Iron Age and Bronze Age chronologies into a single 1503 year sequence wiggle-matched in place by a series of radiocarbon determinations, beginning in 2259 B.C. \pm 37 and ending in 757 B.C. \pm 37. To this, now, we can add the following:

The Tatarli Tumulus

This Phrygian tomb near Dinar in the Province of Afyon, Turkey, has been known for about 25 years. In 1983 we drilled ten cores from the timbers collected in the basement of the Afyon Museum, but because of the way the wood was cracked (up to twelve fragments per core) and the minuscule nature of some of the rings (.02 mm. or smaller) we had never been able to put together a satisfactory chronology. We were certain that we had missing rings in our tentative 159 year chronology, and it matched with nothing else in the world. This last summer we sawed 30 sections from these timbers and built a 259 year chronology for the juniper and 237 years for the cedar timbers, both ending with the waney edge immediately under the bark. Not only do the two chronologies match with one another but they also match the juniper ring-sequence from the Midas Mound Tumulus at Gordion. (The overlap is small, but see the next paragraph.) The end-date for the Tatarli Tumulus wood is 531 B.C. \pm 37. This is of interest because the painted scenes of phalanxes, sphinxes, griffins, and birds on the squared inner faces of the gable-end logs are strongly reminiscent of late 6th century Attic Black Figure vase painting (see below). The 1503-year master chronology is thereby extended to 1728 years.

The Ziggurat Of Nabonidus At Ur

Two logs in the British Museum, allegedly from the Ziggurat, possibly reused, and definitely with many rings eroded from the exterior, had been measured in 1982. They, too, did not fit anything else we had in our data bank. Now we see that they fit neatly at the end of the Gordion ring-sequence and the beginning of the Tatarli ring-sequence at 714 B.C. \pm 37, overlapping the lot by 108 years and confirming the correctness of the fit. The date of the last preserved ring is a century and a half earlier than the conventional dates for Nabonidus, and our suspicions about both the wood's reuse and dessication are confirmed.

Votive Objects in the Samian Heraion

Now that we have a continuous chronology for the seventh century B.C., it seemed worthwhile to have another look at archaic wooden votive objects from the Sanctuary of Hera on the island of Samos measured in 1982 and 1983. These were found in a deposit in Sector O-12 and consist of statuettes of ladies in *peplos* dresses, of boards, boxes, and an odd relief of a human figure carved crudely into a thick board. Five of them with a 121 year long ring-series can be crossdated with the Tatarli rings, and their last preserved ring is 634 B.C. \pm 37. This accords well with the German excavators' estimate of late 7th century B.C. for their deposition. We plan to measure more of these next year to see whether this date can be refined.

The Burned Gateway at Tille Höyük

This structure, now under the waters of the Euphrates, excavated by the British Institute of Archaeology at Ankara, and placed archaeologically at the end of the Bronze Age/ beginning of the Iron Age, yielded a 218 year sequence of oak. Notwithstanding the Tille wood was a different species from the Gordion junipers, the crossdating was excellent with a last preserved ring for the construction at 1140 B.C. \pm 37 (no bark, however, but an indication of sapwood). A second grouping of end-dates 70 years earlier at 1210 B.C. \pm 37 suggests an earlier building phase. Geoffrey Summers's monograph on Tille is in a final stage of preparation and should appear in a year or so with our contribution about the dendrochronological dates appended.

The Roman Shipwreck at Comacchio (Ferrara)

Not yet a part of our long master tree-ring sequence, but surely no more than about a half-dozen years away is a 513 year long chronology of boxwood from the Comacchio wreck. As far as we know, this is the first time anybody has tried to build a dendrochronological sequence for *Buxus*. This ship went down carrying a mixed cargo of boxwood logs (including the bark) and over three tons of lead ingots stamped with the name AGRIPPA. The spectacular exhibition catalogue *Fortuna Maris* (in Italian) prepared by Dr. Fede Berti is available from the Ferrara Museum.

Fifteen chapters of *Fortuna Maris* cover the techniques of ship-building (particularly interesting because this is a sewn ship), the rigging and cordage, the pottery, a group of lead *naiskoi*, stamped amphoras, lamps, leather garments, bronze vases, balance beams, wooden utensils, and fishing implements: some 313 catalogued items in all. Additional specialist chapters cover materials analyses of the clay in the cargo and several classes of organic material. Our dendrochronological results will be a supplement to the catalogue. Even before we started cross-dating, the assemblage of material plus the inscriptions suggest a bark date no later than 12 B.C., the date of Agrippa's death, and possibly only a few years earlier. The Comacchio ring-sequence should begin about 524 B.C. or slightly earlier, only 6 years or fewer after the Tatarli ring-sequence ends.

Long-term followers of the Aegean Dendrochronology Project's fortunes will remember that the five hundred years on either side of the Year 1 are noteworthy for the skimpiness of available dendrochronological material. Now the B.C. side of the graph is largely taken care of. That the 513 year Comacchio ring-sequence is going to be useful is attested by the fact that already crossdating with other sites has been achieved. Ring-series which match Comacchio's include boxwood from the Pakleni shipwreck (YU) and cedar from the Darende Tumulus (Malatya, TR) mentioned in previous reports. We expect to be able to add more in the very near future.

Work-in-Progress

The lab is in full swing as of December 1991 with the following among the highlights: Rachael Perkins, assisted by Jennifer Huret and Sue Brewster, is working on the well over 215++ new samples from the 7th century B.C.(?) Urartian palace of Ayanis/Agarti on the east shore of Lake Van. Two more boxes of charcoal which arrived just this past week will keep them busy for some while. We have Urartian wood from Adilcevaz/Kefkalesi, & Ccedilavustepe, and Bastam with which to compare it, and of course we will look for a fit with the Gordion/Tatarli chronology. Rachael is working on Ayanis for her Undergraduate Honors thesis. Preliminary suspicion is that this may turn out to be one of Rusa II's palaces and therefore from the 7th century. Stay tuned.

John Huber, assisted by Sasa Durman (our Visiting Scholar from Zagreb University), is working on the Monumental Mudbrick Structure and the so-called "Byz-Fort" from Sardis as well as the Phrygian levels at Kaman/Kalehöyük/ Kirsehir. John is working on Sardis and Kaman for his Undergraduate Honors thesis. The Sardis and Kalehöyük wood is almost all oak. Would that the Sardis MMS had not burned so thoroughly and violently! Working with its scraps of charcoal requires the patience of Job.

Carol Griggs, having dealt with the difficult wood from Comacchio, is working again on the oak pilings from Sisak (Roman Siscia, Celtic Segestica). As of Thanksgiving eve she had been able to extend the Sisak sequence to 363 years. These are pinned in their approximate chronological place by a coin of Tiberius inside the iron shoe that was nailed to the point of one piling.

Hope Kuniholm, in addition to administering to the daily needs of the lab, has just finished a 198 year EBA juniper sequence from Konya-Karahöyük. Prof. Sedat Alp, the excavator, says it is from his Level 6/7 or the middle of the third millennium B.C., approximately contemporary with the Alaca Höyük royal graves. She is about to begin work on the Troy II charcoal excavated from Megarons IIA and IIC at Troy last summer by Prof. Manfred Korfmann.

Miles McCredie has set up a Local Area Network to connect our four measuring stations, the computers on which most of the crossdating and calculating are done, and the one in my office with the Cornell mainframe computer and the outside world. He is also rewriting a lot of our software.

Newcomers Tony Pasca, Mac North, and Alex Gendell are ready to begin work on Early Bronze Age and Eneolithic wood collected from Sozopol in Bulgaria last summer by Sasa Durman.

And then a couple of weeks ago I was able to crossdate the innermost rings of the Dashur Boat (in the Carnegie Museum in Pittsburgh) with a sequence from the coffin of Ipi-ha-Ishutef, an army clerk of Dynasties IX/X (in the Oriental Institute of the University of Chicago). This is the first time that we have been able to achieve intersite crossdating of cedarwood found in Egypt (but undoubtedly imported from Lebanon).

We have a full-house of eleven newcomers and five oldtimers scheduled for next semester's lab work and we hope to get through the following list of new samples before the summer, even though it is about double the usual number of samples we have been collecting annually.

Aegean Dendrochronology Project 1991 Collecting Statistics

Bulgaria

SZF	Sozopol, Early Bronze Age	15
SOZ	Sozopol, Eneolithic	15

Turkey

LIM	Limyra, Byzantine and Late Roman	2
YOT	Yassiada, Ottoman Shipwreck	2
TAT	Afyon, Dinar, Tatarli Tumulus. Juniper. Phrygian	30
KAH	Kirsehir, Kaman, Kalehöyük. Oak. 16 contexts. Phrygian, etc.	230
CAK	Samsun, Kavak, Çakalli Mevkii. Oak. Forest	16
KAV	Samsun, Kavak. Oak. Forest	4
KZL	Samsun, Bafra, Kizilirmak River. Oak. Unknown date	1
AED	Trabzon, Boztepe, Ahi Evren Dede Camii. Late Ottoman	11
SEM	Semsiyetepe. EBA?	6
KMI	Miletos, Kalabaktepe.	1
KRK	Trabzon, Sürmene, Karacakaya Camii. Late Ottoman	4
SUG	Trabzon, Of, Sugeldi. Late Ottoman	3
OFB	Trabzon, Of, Bölümlü, Mithatpasa. Late Ottoman	17
OFG/CDG	Trabzon, Çaykara, Dernek, Güney Mahallesi. Late Ottoman	2
DPK/CDK	Trabzon, Çaykara, Dernek, Kondu Mahallesi. Late Ottoman	2
UZF	Trabzon, Çaykara, Uzungöl, Filak Mahallesi. Late Ottoman	12
AYA	Van, Ayanis/Agarti. 19 bags of conifer. Urartian	215
KUL	Kayseri, Kültepe, Karum Ib (1 for ident. only). MBA	2
CMR	Nigde, Çamardı. EBA?	2
ACM	Aksaray, Acemhöyük, Middle Bronze Age	23
KBK	Konya, Karahöyük, Trench X. MBA.	3
KBK	Konya, Karahöyük, Trench C. EBA?	1
HOC	Aksehir, Nasreddin Hoca Türbesi. Oak. 13th cent. ff.	6
SAG	Burdur, Sagalassos. Late Antique	45+
HOY	Burdur, Bucak, Höyücek. Late Neolithic	3
ORT	Çorum, Ortaköy. Hittite	12
EMT	Kütahya, Emet, Egrigözlü. Pinus nigra. Forest	13
MMS	Sardis, Monumental Mudbrick Structure. Oak. Lydian	116
BFO	Sardis, Byzantine Fort (Sardis East Byz. Fort)	4
TRO	Troia. 21 Behalturn. Mostly Troy II	112

WWI	Çanakkale, World War I mine-net float?	1
STJ	Izmir, Selçuk, Ayasuluk (St. Jean). EBA	2
ASH	Aksaray, Asikli Höyük. Aceramic Neolithic. (expected)	
Yugoslavia		
ZDR	Bosnia, Grahovo Zdralovac. Oak. prehistoric?	4
ZAD	Croatia, Zadar, Relja, Liburnian period 5th/6th cent. B.C.	6
VIR	Croatia, Virovitica, 13th/14th/15th/16th century? Bridge	12
VIR	Croatia, Virovitica, 13th/14th/15th/16th century? Well	4
VIR	Croatia, Virovitica, 13th/14th/15th/16th century? Revetment	10
KLA	Croatia, Zagreb, Klarisa Monastery	22
KAB	Croatia, Dubrovnik, Palaça Kaboga	2
PLO	Croatia, Istria, Plomin	1
KAT	Croatia, Zagreb, Crkva Sv. Katarine	2
POR	Croatia, Poreç, Cathedral (1452?), choir bench	1
TOTAL:		997++

Summer 1991 in Retrospect

Usually I close this newsletter with an accounting of a few of the more ludicrous things which happened during the summer. This year there is no need for an addendum, for the most ludicrous event occurred at the beginning of the season when I took a swan dive off the bottom step of a Verona hotel, dislocating left ankle and fracturing left leg. Several patrons who received their annual summer postcards could not figure out who "PIK" is or was. Well, I am he. Basic physical fact learned: marble is harder than bone. Hope (Kuniholm), bless her soul, volunteered to carry on with the driving while I returned to Ithaca for surgery. She was accompanied for the entire summer by Rachael Perkins, already mentioned, and by Anne Blauvelt for the first half of the summer until she had to rush off to teach English in Japan. John Huber joined them in Bodrum for the second half of the summer, and Seçil Tabli joined us in Ankara for the two weeks when we went after the buildings in the mountains above Trabzon. When I rejoined the group in Ankara two weeks after The Fall, I wasn't much use at all to anybody aside from my usual High Moral Presence. The substantial listing of the samples collected in 1991 is a testimony to their combined perseverances. If, however, anybody on this mailing list ever needs a semi-pro wheelchair-pusher, I can recommend Rachael without reservation. If you need a bus-driver, I can recommend Hope. For mountain driving, try Anne. For a stand-up after-dinner comic, try Seçil. And for new insights into Greek inscriptions, ask John.

Lectures Forthcoming

I will be making public presentations on the work of the project as follows:

30 December 1991 Archaeological Institute of America, Annual Meeting in Chicago, panel on Peter James *et al.*'s Centuries of Darkness

8-12 April 1992, Society for American Archaeology Annual Meeting in Pittsburgh, Gordion Symposium

14 April 1992 A.I.A. Travelling Lecturer Series, Worcester, Mass. Society

15 April 1992 A.I.A. Travelling Lecturer Series, Narragansett (Providence) Soc.

16 April 1992 A.I.A. Travelling Lecturer Series, New Haven (Yale Univ.) Society

End of April (To Be Announced): Annual Ithaca Patrons' Night at our house.

Visitors, of course, are welcome at all times in our laboratory in B-48 Goldwin Smith Hall at Cornell.

Grants Received

1991 was also a good year on the financial front, as follows.

The more keen-eyed among you will have noticed a new logo on the letterhead. In return for a long-term funding commitment from the Malcolm H. Wiener Foundation, we have renamed ourselves the Malcolm and Carolyn Wiener Laboratory for Aegean and Near Eastern Dendrochronology. The plaque on the door is so far made of paper, but a harder copy is on order, and we hope to have the Wieners up for a celebration within the year.

The National Science Foundation awarded the project a three-year grant of \$375,000 outright. This does not require matching funds from other sources.

The National Endowment for the Humanities awarded the project a three-year grant of \$200,000 on the usual one-to-one gifts-and-matching basis.

(Both of the above happened just a short time after a visit to our local Chinese restaurant where my fortune cookie read: "Your work interests can capture the highest status or prestige.") ...With omens like that, you can't miss!

And then all of you helped put us over the top on the old (1988-1991) NEH grant, thereby enabling us to get 100% of the NEH matching challenge. The breakdown by donor groups for the past twelve months is as follows:

CATEGORY	GIFTS QUALIFYING FOR NEH MATCH:	
	1 DEC. 1990 -1 DEC. 1991: APPLIED TO NEW NEH GRANT:	THREE-YEAR 1989-1991 TOTAL: OLD (1989-1991) NEH GRANT:
\$25,000+	1	4
\$10,000+		4
\$7,000+		1
\$1,000+	4	13
\$500+	6	12
\$100+	48	101
\$50+	87	158
\$25+	113	276
\$10+	71	129
\$5+	8	10
\$1+	<u>1</u>	<u>0</u>
	TOTAL:	708

Comment

Once again we were able to generate the full amount for the NEH challenge and to do it in a timely-enough fashion so that we were not cliff-hanging at the last minute as in previous years. Indeed, we are almost half a year ahead of schedule.

Although the major gift toward the NEH match came from the Institute for Aegean Prehistory, significant amounts came from loyal Patrons of all color and stripe. The 339 returns from the 1000 letters sent out represents a 33.9% response, slightly higher than our 32% average of previous years. The response rate would have been higher still if the National Endowment for the Humanities had permitted me to count non-cash gifts such as several pans of home-made cookies, chocolate brownies, and a couple of pizzas. Although the latter were much appreciated, they had to be left out of the accounting.

Other Statistics

- 4 Patrons died. We will miss particularly the sage counsels of Professor Wolfgang Müller-Wiener who was an aider and abetter from the beginning.
- 44 of this year's gifts came from New Patrons.
- 144 came from professional archaeologists, classicists, art historians, historians, dendrochronologists, anthropologists, and the like.
- 1 surprising gift came from a Patron who called up one day and said he wanted us to buy something extra that was entirely outside our normal budget. (We bought a video camera that plugs into a microscope so that people who have trouble looking through microscope lenses can watch the action on the screen. It is also great for classroom demonstrations.)
- 1 friend volunteered a Russian translation of "How-to-Collect-Charcoal" and provided it 72 hours later.
- 1 Sasa Durman hauled himself out of a hospital bed on three days' notice and came back with all of our Balkan material.
- 3 Hope (mostly), Rachael, and Anne drove the bus over 8,000 miles with only one clutch lost (the second one wasn't their fault).
- 1 Miles coped with computer gremlins all over the place: *e.g.*, 24-HOUR RUSH! orders that showed up six weeks later, other orders that haven't showed up at all, service people who promised to one thing and then did another. (He's thinking of writing a book about it.)
- 1 Carol ran the lab all summer and got it ready for the September rush.
- 1 Joan Ramage worked in the lab in every spare vacation she has had from Carleton College.

and **MANY** colleagues, excavators, and museum officials went out of their way to provide aid and assistance to the project whether I was on the spot or in the hospital. Permissions came from six general directorates in three countries. Without their help none of this year's good work could have been accomplished. To all, then, our thanks.

With kind regard,

Peter Ian Kuniholm
Associate Professor of the
History of Art and Archaeology

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