

Aegean Dendrochronology Project: December 2007 Progress Report

Thanks to your support, the Aegean (and Near Eastern) Dendrochronology Project at the Malcolm and Carolyn Wiener Laboratory for Aegean and Near Eastern Dendrochronology has had an active and exciting year. It is a pleasure to report both highlights of the year's work and new initiatives. And, as the first snow flurries appear at Cornell, it is great to look back on the photos of summer work.

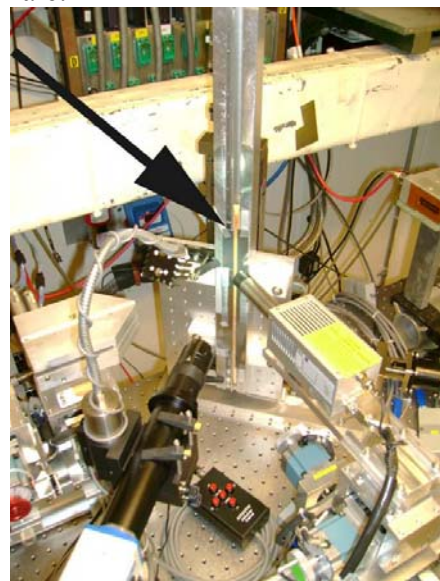
New People, New Projects

We have a new website. Thanks to the many skills of new Informatics postdoc, Dr. Peter Brewer, we now have a redesigned and much expanded website (<http://dendro.cornell.edu/>). Here you will find information about the lab, including our projects, our procedures, a bibliography, and profiles on lab members, as well as 'how to' information for sending us your samples (thank you). The new website hints at a much more major IT revolution currently underway at the lab focused on building a state-of-the-art database system and completely re-engineered Corina tree-ring analysis software package (thanks to Peter Brewer with Lucas Madar and Kit Sturgeon). We hope this will all go 'live' in the first half of 2008.

We were delighted to welcome back our former Fulbright Fellow Dr. Tomasz Wazny as a Research Associate. Tomasz is an experienced and highly regarded dendrochronologist (he created a major oak chronology in Poland among many other accomplishments). Tomasz will work especially on our on-going efforts to bridge the 'Roman Gap' in our dendro sequences, as well to link material from southeast Europe with both northern Greece and Turkey. We hope that oak finds from Bulgaria and Romania will help us in our efforts to take our chronologies back to and through the Roman period in absolute terms. Tomasz and Dr. Carol Griggs contributed to this

work with a trip from Poland through Romania and Bulgaria to Turkey this September, collecting samples and making contacts.

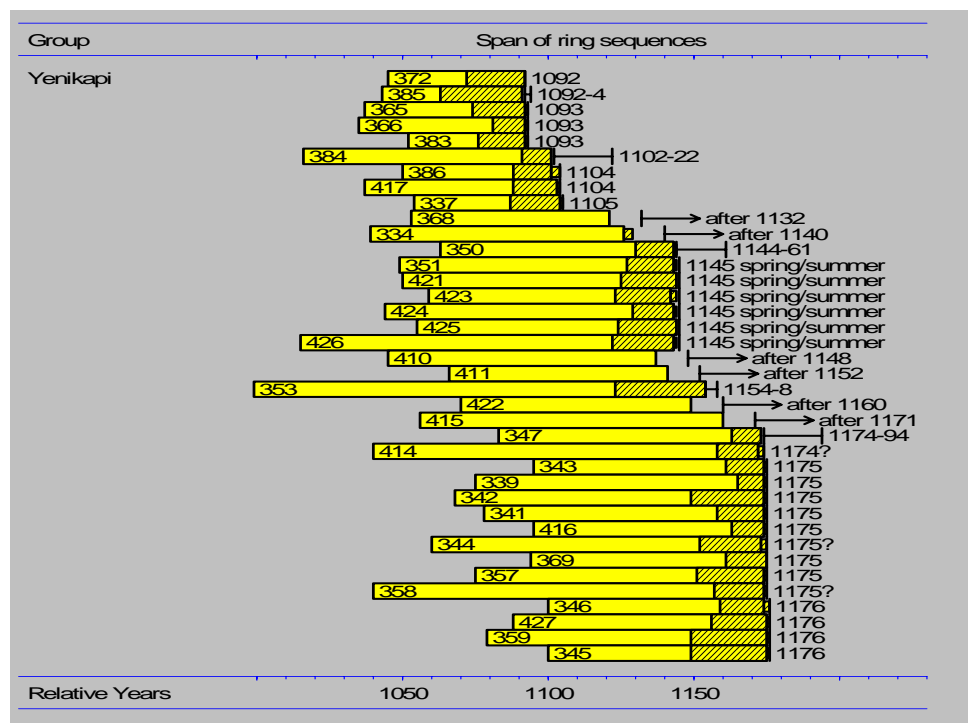
In the summer we also welcomed Dr. Charlotte Pearson. Charlotte did graduate work with Sturt in the UK and is an expert in dendrochemistry and geoarchaeology. She is working on a major new dendrochemistry project in the lab, in particular looking to exploit the potential of the Cornell High Energy Synchrotron Source (CHESS) – this facility allows for the non-destructive analysis of the composition and structure of samples via the use of highly focused high-intensity X-rays. This work looks to develop, advance, and solidify previous efforts to recognize the impacts of major volcanic eruptions from tree-rings. Like all high-tech physics it involves late nights and weekends during 'beam-time'. We have had great collaboration and help at CHESS. We thank its director, Prof. Sol Gruner, and especially Dr. Darren Dale.



The hutch set-up at CHESS for analyzing one of our wood samples (arrow points to the 5mm diameter wood sample) to be interrogated by X-Rays.

The (current) main floating Late Roman chronology for Yenikapı Marmaray from oak samples – we believe this chronology lies in the 5th to 7th centuries AD. Work trying to tie the dating down via (i) radiocarbon wiggle-matching, and (ii) dendro cross-matching, is in progress. Shading = sapwood. It is interesting to observe that there are four groups of samples – each group having the same end year(s) (many with waney-edge/bark-edge) – at Relative Year (RY) 1092/3, RY1104/5, RY1145 and RY1175/6. The homogeneity of the samples suggests that all the oak used in the construction of the harbor came from the same general area. This forest was probably intensively exploited and managed, since a substantial number of trees show patterns

of growth increase which occur too frequently during their lives to be the result of climate or environmental impacts (like a storm knocking out local competitors or insect attack). The approximately 30-year groupings of end-dates implies periodic rebuilding and extension of the harbor structures.



İstanbul, Yenikapı Marmaray

The ADP had collected samples the previous two years from the important and staggeringly large site of Yenikapı Marmaray in central İstanbul, where excavations continue, led by the İstanbul Archaeological Museum under the direction of Dr. İsmail Karamut and Metin Gökçay. Remains from the Roman through to the Ottoman periods have been uncovered in this work – including a number of spectacular ships. In 2007 we again visited the site and collected over a hundred more samples! (I thank Cemal Pulak and his team for their great hospitality and assistance; and also archaeologist Sırrı Çölmekçi) Importantly, I am delighted that we began an active collaboration with the two dendrochronologists at İstanbul University, Prof. Ünal Akkemik and Dr. Nesibe Köse, with this fieldwork.

Vezneciler

Meanwhile, at the nearby Vezneciler Metro site, a group of oak samples (from those collected in 2006 by Peter Kuniholm, Kathryn McDonnell and Jessica Herlich) has been nicely put together by



The joint Cornell-İstanbul team at Yenikapı Marmaray where we sampled, cut, and collected over a hundred new samples this September. A huge effort in the Lab to study all this material has been led by Jennifer Watkins helped especially by Jessica Herlich, Kelly Latta and Eilis Monahan.

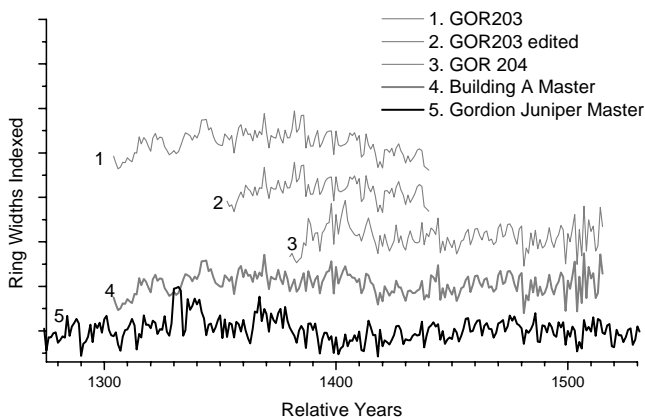
Kelly Latta (initial work as part of her dendro course project) with a date of AD 1782 (bark). These samples come from the horizontal beams found below an Ottoman house at the site.



All that is left of a 1782 Ottoman administrative building at Vezneciler (literally "the Accountants") next to today's Istanbul University is its footprint in the ground. Supporting posts may still be seen in the lower left-hand corner. Now to find out from the Ottoman archives the building's name and function.

Gordion

Last year I mentioned we had started work on some new juniper samples from Gordion from the excavations of Brendan Burke. The samples were found in the foundation of the back wall of Building A (which is part of the Middle Phrygian citadel). Thanks to patient work by Brita Lorentzen, we constructed a good sequence from two of the samples (GOR-203 and 204), which crossdates very nicely with the already-existing Gordion Juniper Master chronology: see below. The date for the last preserved ring is about 991 BC (+4/-7 years using our 2001 *Science* dating).



The Building A elements placed against the Gordion Juniper Master



Brita measuring a Gordion juniper sample in the lab.

Porsuk

This fall, we were also sent fifteen charcoal samples from two sections of the on-going Porsuk excavations (special thanks to Julie Patrier for organizing and sending them). These samples have so far yielded three *terminus post quem* dates: 1652 BC for a pine chronology, 1615 BC for one juniper sample, and 1602 BC for a second juniper sample (from a different part of the excavations). These dates are also with the +4/-7 dating from *Science* in 2001.

Crete

In May 2007, four members of the ADP went to Crete to explore the dendrochronological potential of the island. We enjoyed the great hospitality of the Institute for Aegean Prehistory Study Center for East Crete (INSTAP-SCEC), for which we thank its Director, Tom Brogan, Chief Conservator Stefi Chlouveraki, and all the other staff. After a seminar session on dendrochronology, we set off to sample some old houses, including one being renovated by Senior Conservator Michel Roggenbucke. Samples of fir timbers from the abandoned village of Old Kalamafka in east Crete provide a crossdate of AD 1890 (last ring measured – this work formed Kayla Atland's dendro course project for the current fall semester). Interestingly, the fir seems likely to have come from the Adriatic region. The monastery of Kiria Akrotiriani Toplou in the extreme east of the island provided samples from cedar timbers, which crossdate with cedar from southeast Turkey – spotted by the ever vigilant

Peter Kuniholm – with a last preserved ring of AD 1857 (no bark yet). Other (fir) timbers from the monastery have a last-preserved ring of AD 1842 and may also have come from the Adriatic. We look forward to more work at this site.

We then met up with Dr. Jennifer Moody and Prof. Oliver Rackham to visit several remote areas. It was an amazing experience to visit these places with their expert knowledge of Crete and its botany. Most exciting were the White Mountains where we found a cypress with at least 927 rings. Crossdating these trees will be a challenge – the rings are tiny, there are issues of missing rings to resolve, and the samples are difficult, to put it mildly. But we will try.



Oliver Rackham and Jennifer Moody were our wonderful guides to some fabulous places and trees.



Sturt, Brita, Jen, Tomasz and cypress, White Mountains, western Crete.



Stefi Chlouveraki coring a pine.



At the INSTAP-SCEC ready for road trip.

Cyprus

In June we also mounted a serious assault on the forests of Cyprus (and had the only hospital trip of the year from a scorpion sting), sampling several hundred trees, including junipers in the coastal Akamas area in the far west of the island, *Pinus brutia* (red pine) in the Pafos forest, cedar in the famous Cedar Valley area, and juniper and *Pinus nigra* (black pine) in the high Troodos. Already these trees have started to provide us with new long juniper and pine chronologies: oldest *Pinus nigra* tree-ring so far dates from AD 1304; oldest juniper ring AD 1434; and *Pinus brutia* AD 1656 (the last measured by Rachel Kulick who is working on Cypriot dendrochronology in the lab as part of her Hunter R. Rawlings III Cornell Presidential Research Scholars program award). With the much-appreciated assistance of Dr. Maria Parani of the University of Cyprus, we also

started a program to investigate some of the spectacular Byzantine churches of the Cypriot mountains. We hope these may provide important historical wood for dendrochronology, and, in reverse, that dendrochronology may greatly assist in the study of the chronology and history of these beautiful buildings.



The good ones always seem to involve a climb: but it proved to be the oldest Pinus nigra tree known so far on Cyprus.



Jen sampling at Galata, Cyprus.

Alalakh, Liman Tepe, Oymağaç Höyük

Work in Turkey in August included visits to the excavations, directed by Prof. Aslıhan Yener, of the famous Middle to Late Bronze Age site of Alalakh in SE Turkey, and to the extraordinary prehistoric site of Liman Tepe in western Turkey directed by Prof. Hayat Erkanal (many thanks to Dr. Riza Tuncel who hosted my visit). New

samples also arrived from the Free University of Berlin and Bilkent University excavations at the Hittite site at Oymağaç Höyük (thank you especially to Prof. Rainer Czichon).



Sampling with Bike Yazıcıoğlu at Alalakh, Turkey.

Other Samples, Other Projects

Mentioned above are only a few of our current Aegean and Near Eastern projects. We are also working on several projects started last year or earlier. For example, a first effort at dating several sites and temporal horizons in southern Armenia from the Middle Bronze Age to Artaxiad periods from the Vorotan Project's work, combining dendro-radiocarbon wiggle-matching and radiocarbon, is now ready for publication. We also continue to work with samples from Dr. Yaacov Kahanov from Akko and Dor Tantara Lagoon, and samples from a number of other sites.

And, as ever, we are working on finding samples to bridge the gaps between our living trees and our floating chronologies. We are pushing forward as rapidly as possible on the East Mediterranean Radiocarbon Intercomparison Project (EMRCP) in collaboration with Bernd Kromer at Heidelberg; here we hope to have a continuous East Mediterranean (specifically Aegean) radiocarbon calibration record for the Early Iron Age back to the early Middle Bronze Age by mid-2008.

We are very grateful for all the samples we have been able to collect or which have been sent to us. If you are anywhere in the central or east Mediterranean, the Aegean, the Near East, southeast Europe or the Transcaucasia regions,

and have wood from historic, archaeological or palaeoenvironmental contexts, please contact us. (See: <http://dendro.cornell.edu/samples.php>)

Kuniholm Conference Volume and Honors

We have nearly all papers in and editing and laying out work is well underway. Mary Jaye Bruce is adding LaTeX to her many accomplishments and is doing a wonderful job getting texts into shape. Meanwhile, Peter has been elected a Fellow of the Society of Antiquaries in London, and also the Society of Antiquaries of Scotland.

On the Other Side of the Pond

Students taking the dendrochronology course at Cornell in 2007 added fieldwork (sampling local trees or historic buildings) to their experience. One of the buildings sampled was McGraw Hall (bark date of AD 1870 for the main roof beams – this work formed Eilis Monahan’s project for the dendro course). We have often selected notable weather days: Cornell closed in a snow storm on Valentine’s Day while we were sampling at McGraw, and veterans of another trip still remember the arctic weather while sampling oaks on the Cornell golf course. Some of the students from the spring course came to the Mediterranean this summer to work on the ADP.

Over the years we have been dating a number of palaeoenvironmental contexts and historic structures in northeast North America, Maine, Massachusetts and New York State, in particular; much of this work stems from the initiative started by Carol Griggs in the course of her PhD project. Local enthusiasm continues to help spur and support this work.

Extra Reading

The new website has a bibliographic listing of lab members’ publications. Some (especially more recent ones) are also downloadable for you to read as Adobe PDF files. Please check out.



Carol and Jen sampling in Maine.

Many Thanks

All this work has only been possible thanks to the extraordinary hard work of everyone in the lab: Peter Brewer, Mary Jaye Bruce, Carol Griggs, Brita Lorentzen (the lab’s new Ph.D student also from Fall 2007), Charlotte Pearson, Jen Watkins (lab manager) and Tomasz Wazny, and also our 2006-2007 and 2007-2008 academic-year assistants: Dan Dauplaise, Diane Truong, Rebecca Wall (2006-2007), Jessica Herlich (2006-2008), Rachel Kulick, Kelly Latta and Eilis Monahan (2007-2008).

Particular thanks goes also to the essential ongoing support of the patrons and supporters of the Malcolm and Carolyn Wiener Laboratory for Aegean and Near Eastern Dendrochronology and its Aegean (and Near Eastern) Dendrochronology Project.

Thank you all very much! We hope to continue to make great progress in 2008. I look forward to updating you again next year.

Sturt W. Manning, Cornell University