

XYLARIA AT THE FOREST PRODUCTS LABORATORY PAST, PRESENT, AND FUTURE

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Summary

This report describes the history and current status of wood collections housed in the Center for Wood Anatomy Research at the Forest Products Laboratory, USDA Forest Service. The collections include the original Madison collection (MADw.) and the collection formerly housed at the Yale School of Forestry, Yale University (SJRw.) and the Chicago Field Museum (Fw.). General statistics are provided for MADw collection, including the Fw collection. Prospects and hopes for the future of xylaria at the Forest Products Laboratory are discussed.

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Key words: wood collection - xylaria.

Résumé

Cette note brosse un aperçu de l'historique et de la position actuelle de la Xylothèque basée au Center for Wood Anatomy Research du Forest Products Laboratory. Elle donne des statistiques concernant la collection de Madison (MADw) y compris celle du Chicago Field Museum (Fw). Elle examine les perspectives d'avenir et formule ses espoirs pour le "devenir" de la Xylothèque.

Mots clés: collection de bois - xylothèque.

The Past

Early Development of Wood Collection

A day after the formal opening of the Forest Products Laboratory, USDA Forest Service, in June 1910, Eloise Gerry' (Fig. 1) reported to work and the wood anatomy unit, along with the wood collection at Madison (MADw), was born² Gerry was specifically hired to prepare microscope slides and photomicrographs for wood anatomical study. She held both bachelor's and master's degrees from Harvard University's Radcliffe College for women and was hired because of her experience in wood anatomy and tree physiology. Her master's thesis was entitled Distribution of "Bars of Sanio" in the Coniferales. In her personal notes (Gerry 1961), Gerry states, "I must admit the Forest Service did not want a woman, but as it happened there wasn't

any man willing to come and do the work." Her statement reflects some of the politics at the time, but this did not stop Gerry, the first female scientist in the Forest Service. (For more information, see Nelson 1971.)

The Forest Products Laboratory (FPL) did not have a wood collection nor did it have much equipment for wood anatomy research. In the summer of 1910, the University of Wisconsin provided a microscope and quarters in Science Hall for Gerry, and she borrowed a microtome from Edward C. Jeffery, her major professor at Harvard. However, before Gerry could begin sectioning, she needed wood samples, so her first job was collecting woods of the United States. Initially, most samples came from expositions and fairs as well as a small collection brought to FPL by Harry Tiemann, Gerry's first supervisor and head of the Timber Physics section. Tiemann, a kiln drying specialist, worked at Yale University in a Forest Service laboratory and then in Washington, D.C. Many of these initial samples were 1-m (4-ft) logs cut and finished to show bark, end grain,

¹ Most of the information about Eloise Gerry was obtained from Gerry herself (1961,1977), McBeath (1978), and Nelson (1971).

² All xylaria or wood collection acronyms follow Stem 1988.



Fig. 1. Eloise Gerry at her microscope in the 1930s.

Fig. 1. *Eloïse Gerry à son microscope dans les années 1930.*

Fig. 2. Arthur Koehler at his laboratory bench shortly after the Lindbergh kidnapping trial in 1936.

Fig. 2. *Arthur Koehler dans son lieu de travail peu après l'enlèvement du fils de Lindberg.*

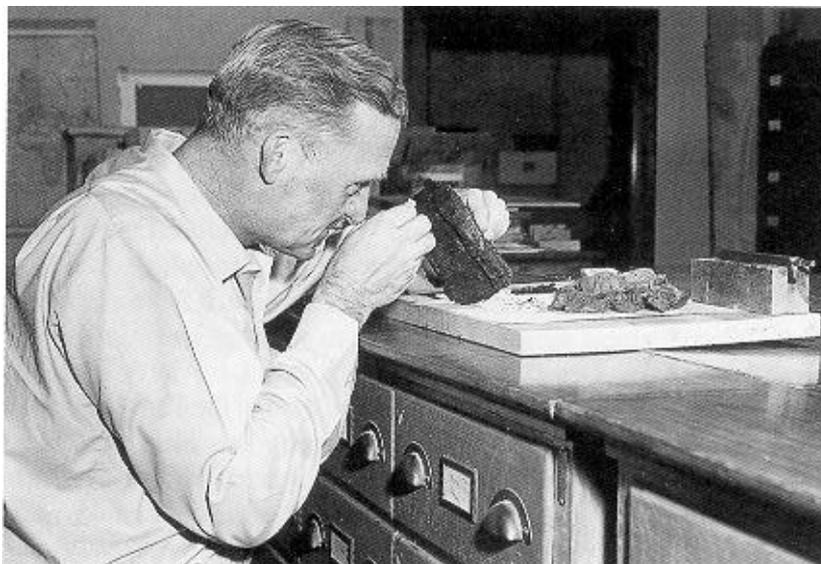
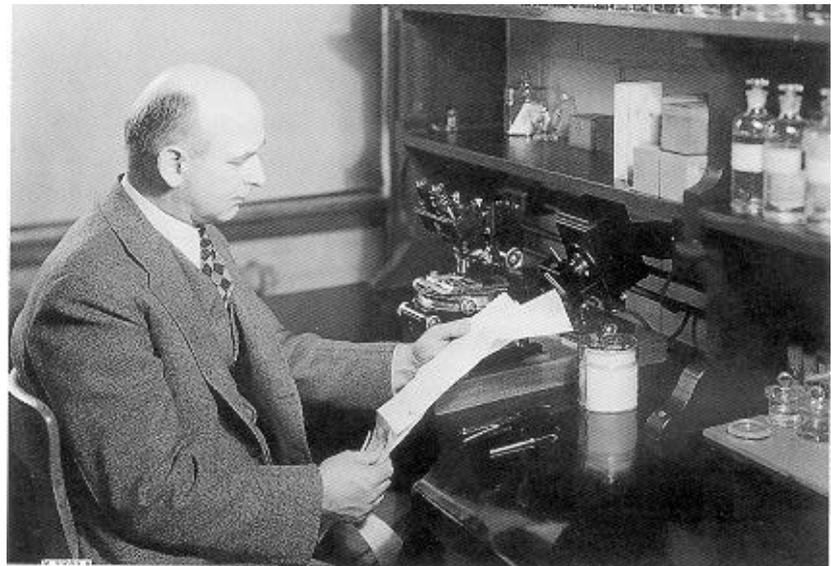


Fig. 3. Bohumil Francis Kukachka examining a piece of decayed wood with a hand lens resting on top of a MADw wood collection cabinet in 1963.

Fig. 3. *Bohumil Francis Kukachka examinant en 1963, à la loupe, un morceau de bois pourri sur un classeur de la xylothèque de Madison.*

and longitudinal gram. Small samples were used for sectioning and were added to the collection, and the remainder of the log was used to decorate the halls at FPL. Although some of these samples are still in the FPL collection, if there was herbarium material documentation associated with them, it has since been lost or at least disassociated from the wood samples. Collectors listed on some of these early samples include C.D.M. Ell, co-author with S.J.R. Record of the *Timbers of Tropical America* (1924), George Sudworth, Dendrologist for the Forest Service, and others who were apparently foresters working on the national forests.

In 1914, Arthur Koehler (Fig. 2) joined the Timber Physics unit at FPL to handle wood identifications. He had entered the Forest Service in Washington, D.C., in 1911 with a new bachelor of forestry degree from the University of Michigan. His title was “xylotomist,” which he retained over his career except for a few years when it was modified to “specialist in wood structure.” To my knowledge, Koehler was the only xylotomist in the Forest Service! When Koehler arrived at FPL, he brought a small wood collection in beautiful walnut cabinets that he had maintained in Washington. This may have been part of Tiemann’s collection since Tiemann was also in Washington at that time, and records suggest that Tiemann maintained a collection there as early as 1910.

In 1916, Koehler essentially became head of the Wood Anatomy unit since Gerry had moved to Columbia, Mississippi, where she was applying her knowledge of microscopy and plant physiology to naval stores research. In 1920, Koehler was made head of a new FPL division, Wood Technology, which almost became a division of biological science because of strong feelings that a closer relationship should be developed between the living forest and wood products. At this time, the FPL wood collection was still in its infancy and perhaps only a few thousand samples had been accumulated. Most of these samples were native woods, and only a small percentage were tropical in origin.

By the time Koehler became known as the “expert on wood” at the Lindbergh kidnapping trial in 1935, Gerry had returned to FPL, continuing her work on naval stores and the properties and uses of foreign woods. The FPL collection was growing, but most samples were without the associated herbarium vouchers. Many samples that were sent to FPL for identification

were added to the collection (personal communication, R.C. Koeppen, 1996).

In early 1945, Bohumil Francis Kukachka (Fig. 3), known as Kuky by nearly everyone, was interviewed by Koehler for a position as a wood anatomist. During the interview, Kukachka noticed three specimens of Chilean woods on Koehler’s table. After examining them, Kukachka said that they looked like *Nothofagus*, *Laurelia*, and *Aextoxicon*. His diagnosis proved to be correct, and on the next day Koehler offered him the job. At the time, Kukachka was teaching at the Forestry School at Louisiana State University. He had accepted this position after earning his bachelor of science degree in 1937 and doctorate degree in 1942 in wood technology from the University of Minnesota. His Ph.D. thesis was entitled Systematic Anatomy of the Woods of the *Tiliaceae* (Kukachka 1944). Kukachka began his career at FPL on August 18, 1945 (Miller and Mori 1984).

Reorganization of Collection

In 1948, Koehler retired and Kukachka became the curator of the collection, with Koehler’s sanction to maintain the collection as he pleased. Since new oak cabinets built at FPL had just been installed, it was the perfect time to overhaul the wood collection as the specimens were moved from the walnut cabinets to the new cabinets. (Today, both sets of cabinets are still being used.) While moving the specimens, Kukachka decided to reorganize the wood collection from a numerical system to one where the specimens were arranged alphabetically by family, then genus and species, and finally accession number. His goal was to make all the specimens of a particular genus readily available for examination and comparison, to serve the vast number of requests for wood identification. In addition, his philosophy was to keep only samples that were well-authenticated with herbarium material. Consequently, he discarded many undocumented samples that had been accessioned from previous identifications (personal communication, R.C. Koeppen, 1996). This left large gaps in the numbering system that were sometimes filled by more recent incidental acquisitions; large collections were never divided to fill in the gaps. The unfilled numbers have been referred to as “open” numbers. In addition, the original handwritten index cards were retyped by Kukachka and his secretary. As a consequence, it is difficult to know how much information might have been lost and how many samples were in the collection in 1945 when



Fig. 4. Filing system for MADw wood collection at FPL Center for Wood Anatomy Research.

Fig. 4. *Rangement de la collection MADw au FPL Center for Wood Anatomy Research.*



Fig. 5. MADw wood collection specimens.

Fig. 5. *Echantillons de la xylothèque MADw.*

Kukachka became the curator. However, the last sample collected by Koehler was dated 1945 and numbered MADw 11386. In addition, several samples collected by Kukachka in 1945 are numbered between 11350 and 11400. This suggests that the collection contained approximately 11,000 samples in 1945 before it was reorganized. A search of the files, review of dates on records, and examination of a variety of collectors' names before sample 11400 suggest that Kukachka discarded several thousand samples, possibly as many as 6,000.

Although we can only speculate how the collection was organized and what it contained prior to 1945, today we use the same system initiated by Kukachka. The wood specimens are generally 80 mm (3 in.) wide and 100 mm (3.9 in.) long so that they can be filed conveniently in wood drawers (Figs. 4 and 5). The specimens are organized alphabetically. The scientific name, country of origin and accession number are written on each sample with a black indelible marking pen. All the information about the specimen is placed on two index cards, 76 by 127 mm (2.9 by 5 in.). One card is filed alphabetically by genus, species, and accession number, and the other card is filed numerically.

In 1955, Robert C. Koeppen started working for Kukachka as a part-time student employee while working on his master's and doctorate degrees in taxonomy at the University of Wisconsin. The highest accession number in the collection at this time was about 17000. It is obvious that some open numbers had been filled, but certainly not all of them. Also, some numbers were still being purged as Kukachka found misidentified samples and "useless" samples, as he called those without associated herbarium vouchers. Before Koeppen arrived, there were no records of accessions, loans, and exchanges. However, because of Koeppen's training as a taxonomist and previous work in the University's herbarium, he initiated good curatorial practices and accurate recordkeeping for both the herbarium and the wood collection.

In 1963, I arrived at FPL as a summer student from West Virginia University, where I was majoring in wood science. For two summers, I measured cell wall thickness in redwood (*Sequoia sempervirens* (D. Don) Endl.) in a laboratory next door to Kukachka, Koeppen, and the wood collection. I was intrigued with the collection, research, and identification work. In the summer of 1965, I worked for Kukachka and returned

in January 1966, while I undertook graduate studies in botany at the University of Wisconsin. After finishing my master's degree in 1968 with Professor Ray Evert, I enrolled as a Ph.D. student at the University of Maryland in the Botany Department working under Professor William Louis Stern who had just returned to teaching from work at the Smithsonian Institute in Washington, D.C. By this time, the FPL collection had grown to nearly 25,000 specimens, but open numbers still remained. By the time I returned to FPL in 1970, the number of wood specimens had more than tripled with the acquisition of the Samuel James Record Memorial wood collection (SJRw, formerly Yw) from the Yale University School of Forestry.

Acquisition of SJRw and Field Museum Collections

The full story behind FPL's acquisition of the SJRw collection is too lengthy and complicated for this paper; the following is a brief summary. In 1960, the last issue of *Tropical Woods* was published at Yale, and William Louis Stern, editor of this publication and curator of the SJRw collection, accepted the position of curator of the wood collection at the Smithsonian Institute (USw). The School of Forestry at Yale formed an advisory committee to make recommendations concerning their longstanding tropical woods program, which included the fate of the SJRw collection. At the same time, the faculty of the School of Forestry decided that emphasis in wood anatomy should be changed from systematics to the experimental and developmental approach. Without staff, budget, and faculty members with an interest in collection, systematics, and/or wood anatomy, the collection remained stagnant. In 1966, the advisory committee recommended disposal of the collection. Initially, several departments at Yale were contacted, including the Peabody Museum, but none of them wanted the collection or had the staff and budget to maintain it.

A few years later, a home for the collection was sought outside Yale. In a letter to Dr. H.O. Fleischer, then Director of FPL, dated May 19, 1969, Dr. Francois Mergen, Dean of the Yale School of Forestry, divulged the university's decision to dispose of the collection:

"At the present time this collection is on an inactive status and for several reasons it has been decided that the collection could make greater contributions and integrate better at another institution. Accordingly, we are now writing to several selected institutions to see if they are interested in assuming responsibility for the

collection. The choice of a new home for the collection will be based primarily on where the collection can make the greatest scientific contribution and can rely on potential continuity of support.”

In his reply, dated May 28, 1969, Fleischer expressed strong interest in acquiring the collection, noting that “such a collection would facilitate our wood identification service, provide opportunities for research in this highly specialized field and would no doubt attract...scholars from all over the world.” After much negotiation, a cooperative agreement, originally established in 1963, was amended in late 1969 to provide the School of Forestry a \$20,000 grant, and thus, FPL obtained the SJRw wood collection. The collection had 55,000 wood specimens, an associated herbarium with approximately 25,000 sheets, a microscope slide collection, index cards, and related correspondence and documentary files.

When Louis O. Williams learned that FPL had obtained the SJRw collection, he offered to make the wood collection at the Field Museum in Chicago (Fw) (Williams 1971) available to FPL through Kukachka. Kukachka accepted on behalf of FPL, and the 20,000 specimens were moved to Madison in 1971. This brought FPL’s holdings to 100,000 samples in three collections, and there was no room to house any of them. In anticipation of the acquisition of the Yale and Field Museum collections, new quarters were arranged on the fourth floor of the main FPL building. But how was this massive collection to be organized?

The SJRw collection came complete with its original wood cabinets (Figs. 6 and 7), but these were of a different size than the cabinets housing the MADw specimens. It was decided to keep the two wood collections and their accompanying index cards and files separate. However, both the microscope slide collection and herbarium associated with MADw were combined with the collections from Yale. After settling the SJRw in its present position, Kukachka decided to reorganize the 55,000 specimens from a numerical arrangement to the alphabetical system he had designed for the MADw collection. On paper, this looked like

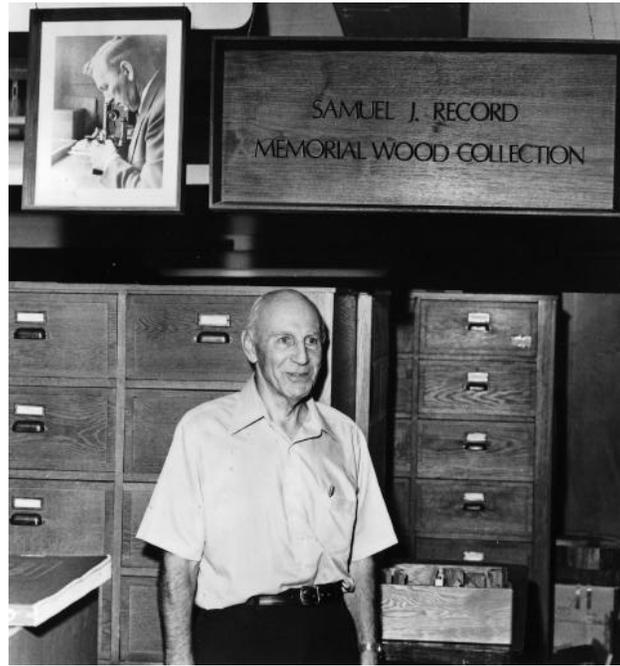


Fig. 6. Robert Hess in front of SJRw wood collection in 1983. Note photograph of Samuel J. Record in upper left corner.

Fig. 6. Robert Hess en 1983 et la collection SJRw. Notez la photo de Samuel J. Record dans le coin supérieur gauche.

an easy task, but since I was assigned this task as one of my duties, I soon discovered that in reality it was dusty, dirty, tedious, and time-consuming. Years passed before the collection was finally reorganized.

The specimens from the Field Museum came in moving boxes. No cabinets, files, index cards, slides, or herbarium accompanied the wood specimens. Kukachka decided to incorporate this collection directly into the MADw collection. All the information about the sample was contained on a label pasted on the sample. A MADw number was assigned to the specimen, and the information on the label was then transferred to index cards. However, Kukachka wanted to examine every sample with a hand lens before adding it to the collection to confirm its proper identification. If the sample had been misidentified, it was discarded. In addition, he discarded many samples that were not vouchered, although I sometimes retrieved specimens from the trash if they seemed to be of some historic significance or in short supply. Of course, duplicate samples that were already represented among the MADw woods were not saved, although I often selected the biggest and best sample for the MADw collection. In the end, approximately 8,500 of

the initial 20,000 Fw specimens were accessioned. At the same time that I was accessioning the Field Museum material, I established contact with Roger Dechamps and we began exchanging specimens. Such a wealth of material and all with vouchers! Most vouchers are deposited in BR³ or TERV, but Dechamps was kind enough to deposit some vouchers at MAD. Today, FPL has approximately 2,000 wood specimens from TERVw (Koninklijk Museum voor Midden-Afrika Musée Royal de l'Afrique Centrale, Tervuren, Belgium), and nearly 1,500 of these had been collected by Dechamps.

The Present

The SJRw wood collection and accompanying files remain essentially intact. This collection is the same size as it was when it arrived at FPL in 1969—55,000 specimens. We have not added specimens to the SJRw collection. The only changes have been to arrange the specimens alphabetically by family, genus, species, and

accession number and to mark the accession number, scientific name, family name, and country of origin directly on the specimen with black indelible ink. The herbarium and slide collections have been merged with FPL holdings, but they have been clearly marked to indicate where each originated. I estimate that the herbarium contains approximately 27,000 sheets and the slide collection 60,000 slides, representing perhaps 25,000 specimens.

The MADw collection has grown to nearly 50,000 specimens. We are continuing to add specimens to this collection but have more or less restricted the accessions to those that are backed with herbarium material. On occasion, however, I will add specimens without vouchers if we do not have ample material or if the specimens are of exceptional quality (e.g., from large mature trees showing heartwood). I recently received a wood specimen reported to be mangium (*Acacia mangium*) from a plantation in Malaysia. I checked both collections and neither contained a specimen of this wood. The specimen was definitely

³ All herbarium acronyms follow Holmgren et al. (1990).



Fig. 7. Aisle in SJRw wood collection. All xylaria or wood collection acronyms follow Stern 1988. All herbarium acronyms follow Holmgren & al. (1990).

Fig. 7. Vue partielle de la xylothèque SJRw. Les acronymes sont donnés selon Stern (1988) pour les xylothèques et selon Holmgren & al. (1990) pour les herbariums.

Acacia, but was it really *mangium*? I sent a small piece of the specimen to Mr. J. Ilic at CSIRO in Australia for confirmation. He agreed that the wood was probably mangium, but he could not be certain since several other species were quite similar. However, based on its origin from a plantation in Malaysia, it must be mangium. I agreed with his analysis and added the sample to the collection. The next time I need a specimen for comparison at least I have one!

Development of Database

In this age of computer technology, we are still using index cards to record all the information about each specimen, but we have developed a database for the MADw collection. In the late 1970s before the advent of desktop computers, I began entering wood collection data from MADw into a mainframe computer. FAMULUS, the program to manipulate the data, was written for bibliographic information, but it also worked for a "library" of woods. Since then, we have converted the program and data from a mainframe at the University of Wisconsin-Madison to a mini-computer at FPL and just recently to a Macintosh, where we use a program called Panorama. Of course, the greatest problem has been data editing, a neverending process. Since we did not have funds to accomplish the database quickly, we worked on it only as time and money allowed. Many students and part-time employees worked on the project, entering and editing data, although I had to do a certain portion of the editing. Now, we can enter new accessions directly into the database, print index cards, sort, search, create forms, and do a host of functions!

Description of MADw Collection

I examined the MADw database and accumulated some interesting facts. Our latest accession number is over 49000; however, 1,800 are still open numbers and nearly 2,000 specimens are being processed and have not yet been entered in the database. Presently, the database contains approximately 45,000 specimens, which are 91 % hardwoods or dicotyledonous angiosperms. Represented are about 14,000 species, 3,000 genera, and 265 families. Of course, this does not account for the synonymy that exists in every xylarium and herbarium. The genus with the most species is *Quercus* with 222 species, followed by *Eucalyptus* with 144, and then *Ficus* with 127. However, the genus with the most specimens is *Pinus* with 1,311, followed by *Quercus* with 981. The four

most common species are softwoods (gymnosperms): *Pinus echinata* P. Mill., *P. ponderosa* Douglas ex Lawson, *P. palustris* P. Mill., and *Pseudotsuga menziesii* (Mirb.) France, with 124, 122, 97, and 88 specimens, respectively. The two most common hardwoods are *Cordia alliodora* (Ruiz & Pavon) Oken (82 specimens) and *Swietenia macrophylla* King (61 specimens). As you can imagine, the family with the most specimens is *Leguminosae* (*Fabaceae*) with 5,491 specimens—1,724 species and 348 genera.

Based on geographic regions, the collection is 65 % New World, *i.e.*, 28,700 specimens of which 20,300 are from Latin America. The 35 % Old World specimens come primarily from Asia (8,800 specimens) and Africa (4,400 specimens), and the remainder come from Australia, Europe, and the Pacific Islands. The country with the most specimens is the United States, with 8,300 specimens, followed by Brazil with 5,300, Peru with 3,100, Venezuela with 2,000, and the Philippines with 1,700.

As we added data to the database, we tried to determine whether the specimens were vouchered. If the specimens were vouchered, we included the *Index Herbariorum* acronym for the location of the vouchers (Holmgren *et al.* 1990); if they were not vouchered, we used the term NONE. However, we often suspected that the specimens were vouchered, but could not be certain. As a consequence, we marked those specimens with a question mark. At present, I estimate that MADw contains 62 % vouchered material, 8 % not vouchered, and 30 % with an uncertain status. For some of the latter material, we may yet determine if there are vouchers; for the rest, we may never know.

The collectors for MADw have been many and varied. There are well-known collectors such as M. Acosta-Solís, B. A. Krukoff, Llewelyn Williams, and Roger Dechamps, but many collectors are only represented by a few samples. Institutes such as the British Guiana Forestry Department and other xylaria such as USw (Smithsonian Institute) combine to constitute a large percentage of what we designate as collectors. These specimens were obtained through exchange and may represent many collectors. Table 1 lists all the collectors represented by at least 200 wood samples in MADw. Llewelyn Williams collected the most (3,367), followed by B.A. Krukoff (3,168) and Tw. (2,222). Included in the Tw. specimen count is Roger Dechamps' personal collection of 1,435 specimens, the third largest personal collection. Williams, Krukoff, and Dechamps account

for nearly 18 % of the total number of MADw specimens.

One of the greatest benefits of computerizing a wood collection is learning more about the collection. Much of the learning is not in the final searches and sorts that can be done, but in the process of adding data about each specimen. It becomes a history lesson, a taxonomic lesson, and a geography lesson all rolled into one. As we continue to add and edit both the MADw and SJRw collections, we are continually learning and discovering.

The Future

What does the future hold for the wood collections at FPL? I do not know for certain, but I will present my predictions for the short term and my hopes for the long term. We are fast approaching the 21 st century, and communication and computer technologies are changing rapidly. At the same time, resources for research in wood anatomy and maintenance of wood collections are dwindling. Funding is difficult to obtain, and DNA-based research appears to be the on cutting edge and garnering the lion's share of funding in biology. There is no "fat" in the wood collection budget at FPL, and this is probably true for many other wood collections.

In the United States and in other countries as well, many institutes and organizations are undergoing changes resulting from budget reductions. At FPL, we are beginning to implement a major reorganization. Initially, I thought that the Center for Wood Anatomy Research would be merged with another unit because of the small staff (two scientists, no technician, and an occasional part-time student). In the end, not only did the Center remain intact but it also gained another scientist. In contrast, 20 years ago the Wood Anatomy staff consisted of five scientists, one research support person, one technician, and a couple of part-time students. In the next 5 years, I believe that the Center will continue to function as it has for the past decade, but beyond that who can say. However, I believe that the wood collections at FPL will continue to be maintained, at least at the level where specimens will be accessioned and made available to other researchers.

Computers will play an important role in the maintenance of wood collections. The MADw collection is in database form, and a database for the

SJRw collection is in process. Other collections, such as Tw., USw, and RBHw (Bundesforschungsanstalt fur Forst- und Holzwirtschaft, Hamburg), have also been entered into databases, and I expect that many more xylaria will take this route in the future. Perhaps in the next *Index Xylariorum*, we will need a category for databases completed or in progress and software used. At some point, I expect that some databases will be combined and become available for searching on the International Association of Wood Anatomist's Worldwide Web site. This will encourage more careful curating, especially the updating of name changes as a result of misidentification and synonymy. It will also permit access to collections that are now more or less in storage or otherwise moribund. Stem (1973) reported six major U.S. collections: Fw, SJRw, MADw, USw, Aw (Bailey-Wetmore Laboratory of Plant Anatomy and Morphology, Cambridge, Massachusetts), and BWCw (Harry Philip Brown Memorial Wood Collection, Syracuse, New York). Today, Fw has been incorporated into MADw and SJRw remains a separate collection housed at FPL. The Smithsonian Institute still owns USw, but it is stored in Rockville, Maryland, and it is not being actively curated. Harvard University still owns Aw, but again it is just being stored and there is no curator. The BWCw collection is intact and is presently being curated by Dr. Robert Meyer. Imagine a database containing information from just these collections available on the Worldwide Web! Data from other collections like TERVw and RBHw would expand the accessibility of information tremendously.

What the herbarium is to taxonomists, the wood collection is to systematic wood anatomists and wood identification experts. It is the backbone of our research and without it, we are scientists without the tools for research and identification. To continue both research and identification, wood collections such as those at FPL and at Teruvren must be maintained and curated. The sentiments expressed by Stem (1973) are still true today: "Assuredly, it is incumbent upon individual botanists to dedicate themselves to the achievement of commitments from institutions concerning wood collections, their associated activities, and their continued existence and increase."

Dedication

In this "*liber amicorum Roger Dechamps*," I would like to personally acknowledge Roger for his contributions to the wood collections at the USDA Forest Service, Forest Products Laboratory. Roger and

Table 1. Collectors represented by more than 200 specimens in the MADw collection

Tableau 1. Liste des récolteurs représentés par au moins 200 spécimens dans la xylothèque de Madison

Collector	Specimens (n°)	Countries of collection
Abbe <i>et al.</i>	349	Australia, Borneo, China, Japan, Malaysia, New Caledonia, New Zealand, New Guinea, Thailand, Vietnam
Acosta-Solís, M.	233	Ecuador
British Guiana Forestry Department	348	British Guiana
BWCw (College of Environmental Science and Forestry, State Univ. NY, Syracuse)	774	mostly U.S.A.
Capucho, P.	264	Brazil, Paraguay
CLPw including Philippine Bureau of Forestry (Forest Products Res. & Dev. Inst., College Laguna, Philippines)	1,353	Philippines
Cooper, G.P.	360	Costa Rica, Liberia, Panama
Craven, L.A. or R. Schodde	585	Australia, New Guinea, New Zealand
Cuatreacasas, J.	456	Colombia
Curran, H.M. <i>et al.</i>	360	Brazil, Canada, Colombia, Curaçao, Dutch East Indies, Philippines, Surinam, Venezuela, West Indies
De Witte	249	Congo, Zaire
Dechamps, R. <i>et al.</i>	1,435	Angola, Canada, Denmark, U.S.A., Zaire
Detienne, P.	202	Ivory coast
Fors, A.J.	311	Cuba
FPAw (CSIRO, Clayton, Australia)	274	Australia, Malaysia, New Caledonia, Solomon Islands
Fujioka, M.	307	China, Japan Korea
Irwin H.S.	282	Brazil, French Guiana, Surinam
Jacobs, M.	274	Indonesia, Malaysia, New Guinea
KEPw (Forest Research Inst., Kepong, Malaysia)	616	Malaysia
Koehler, A.	532	U.S.A.
Krukoff, B.A.	3,168	Bolivia, Brazil, Cuba, French Cameroon, French Gabon, Gold Coast, Dutch East Indies, Ivory Coast, Malaysia, Nigeria, Trinidad, Venezuela
Maguire, B. <i>et al.</i>	1,252	Brazil, British Guiana, Surinam, Venezuela
Nee, M. <i>et al.</i>	827	Bolivia, Brazil, Colombia, Costa Rica, Mexico, Panama, Surinam, U.S.A., Venezuela

Collector	Specimens n°	Countries of collection
PRFw (former Princes Risborough Lab., Princes Risborough, England)	334	Australia, Brazil, British Guiana, British Honduras, British West Indies, Burma, Canada, Ceylon, Chile, Dutch East Indies, Europe, Fiji, Gold Coast, India, Jamaica, Kenya, Malaysia, Nigeria, Philippines, Rhodesia, Siam, Sierra Leone, South Africa, Southern Rhodesia, Sudan, Surinam, Tanganyika, Trinidad,
Reitz, P.R. or Klein, R.M.	232	Brazil
SANw (Forest Res. Center, Sandakan, Malaysia)	233	China, Indonesia, Malaysia
Smith, H.H.	277	U.S.A
Stahel, G.	355	Surinam
Stearns, J.L.	385	Argentina, Australia, Brazil, British Guiana, British Honduras, Burma, Cameroon, Canada, Cuba, Europe, Gabon, India, Indochina, Jamaica, Madagascar, Malaysia, Mexico, New Guinea, Panama, Philippines, Rhodesia, South Africa, U.S.A, Venezuela
Stem, W.L. <i>et al.</i>	361	Dominica, Panama, U.S.A.
Terv.w (Koninklijk Museum voor Midden-Afrika, Musée Royal de l'Afrique Centrale, Tervuren, Belgium)	2,222	Angola, Canada, Congo, Denmark, Gabon, Ivory Coast, Rwanda, Senegal, U.S.A., Zaire
USw (Smithsonian Institute, Washington, DC)	1,350	52 countries represented
Whitford, H.N. <i>et al.</i>	238	Brazil, Colombia, Guatemala, Honduras, Philippines, Venezuela
Willams, L.	3,367	Brazil, Colombia, Honduras, Mexico, Peru, Thailand Venezuela
World Colombian Exposition	350	Asia, Australia, Brazil, Central America, Ceylon, Chile, Cuba, Ecuador, Guatemala, British Guiana, India, Iran Jamaica, Japan Korea, Liberia, Mexico, Paraguay, Philippines, former USSR, Spain, Trinidad, U.S.A., Venezuela

“Including De Witte and Dechamps.

I started corresponding in the early 1970s and were soon exchanging wood samples. During the 1978 Amsterdam IAWA meetings, I had the opportunity to visit “his” xylarium in Tervuren, Belgium, and as a consequence, I came to know Roger on a more personal basis. He was an avid wood collector and had a keen interest in xylaria and wood identification. Until his retirement, we corresponded and exchanged wood specimens. Roger’s legacy is his beloved xylarium at Tervuren and the many samples that he personally collected.

Literature cited

- Gerry, E. (1961). An oral history interview with Dr. Eloise Gerry. Conducted by Donald G. Coleman, U.S. Department of Agriculture, Forest Service, *Forest Products Laboratory*, RPI-81.
- Gerry, E. (1977). *Some highlights from 44 years at the Forest Products Laboratory*. Reproduced from a paper presented at a forum, U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, WI, 3 November 1954.
- Holmgren, P. K., N. H. Holmgren, and L. C. Barnett (eds.). (1990). *Index-Herbariorum I. The herbaria of the world*. 8th ed. New York Botanical Garden, Bronx, NY, 693 pp.
- Kukachka, B. F. and L. W. Rees. (1944). Systematic anatomy of the woods of the *Tiliaceae*. University of Minnesota Agricultural Experiment Station *Technical Bulletin* 158, 70 pp.
- McBeath, L. W. (1978). Eloise Gerry, a woman of forest science. *Journal of Forest History* **22**: 128-135.
- Miller, R. B. and S. A. Mori. (1984). Bohumil Francis Kukachka (1915-1983). *Britannia* **36**: 458-462.
- Nelson, C. A. (1971). *History of the U.S. Forest Products Laboratory (1910-1963)*. U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, 177 pp.
- Stern, W. L. (1973). The wood collection-What should be *its* future? *Amoldia* **33** :67-80.
- Stern, W. L. (1988). Index xylariorum. Institutional wood collections of the world. *IAWA Bulletin* 3d revised ed., n.s. **9**: 203-252.
- Williams, L. O. (1971). Field Museum’s wood collection. *Taxon* **20**: 824-825.

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WOOD TO SURVIVE

Freddy Maes - Hans Beeckman
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