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Lumber from World War I Research at the Forest Products Laboratory Helps Repair the U.S. Capitol Building

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Abstract

The United States Capitol building was breached on January 6, 2021. Historically significant materials, many made of wood, were stolen, damaged, or destroyed. Shortly after the breach, the USDA Forest Service, Forest Products Laboratory (FPL) was contacted by the Department of Defense and the Architect of the Capitol and asked to provide technical advice and vintage lumber to aid in restoration efforts. This technical report includes the following: (1) details of FPL efforts to provide vintage lumber specimens to the Architect of the Capitol staff for use in repair of the U.S. Capitol building, (2) information on the vintage lumber, including background on the original supplier of the lumber to FPL, and (3) a brief review of the propeller research conducted at FPL during World War I, which was the original use of the vintage lumber.

Keywords: U.S. Capitol, Architect of the Capitol, USDA Forest Service, Forest Products Laboratory, mahogany, Department of Defense, historic preservation, I.T. Williams & Sons, Inc.

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Lumber from World War I Research at the Forest Products Laboratory Helps Repair the U.S. Capitol Building

Preface

Early in 2021, the U.S. Capitol building in Washington, D.C., was breached by a large group of demonstrators that damaged extremely valuable wooden structures significant to the architecture and historic pride of one of the most important buildings in the United States.

The history of the U.S. Capitol building begins in 1793 with the design of the building by Scottish architect, William Thorston. Since then, the U.S. Capitol has been built, burnt, rebuilt, extended, and restored. The Capitol that we see today is the result of several major periods of construction; it stands as a monument to the ingenuity, determination, and skill of the American people (Information from the Architect of the Capitol).

In response to the notable damages mentioned above, a group of citizens from the private sector and several federal agencies joined forces to make a significant and propitious contribution toward the repair of the U.S. Capitol.

This group — scientists, engineers, and business specialists — worked diligently to provide a stock of antique mahogany wood stored in the basement of the USDA Forest Service, Forest Products Laboratory, in Madison, Wisconsin. The wood, stored for over a century, was originally part of a research study conducted for the War Department that was designed to explore its use as propellers for aircraft on the frontlines in France during World War I.

The catalyst of this effort was the mutual enthusiasm of Mr. Nate Kamprath (U.S. Army Ground Vehicle Systems Center, Department of Defense) and Drs. Bob Ross and Adam Senalik from FPL. Their enthusiasm resulted in the coming together of a group of individuals that worked diligently to provide this material to the Architect of the Capitol.

It was my distinct pleasure to be a part of this group of true patriots. We worked through challenging bureaucratic hurdles, a worldwide restricting pandemic, and a short timeline to provide this wood used in the repair of our iconic Capitol.

Keith York, Program Manager, TRAX International Corporation, U.S. Army, Tropic Regions Test Center, Panama

Lumber from World War I Research at the Forest Products Laboratory Helps Repair the U.S. Capitol Building

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Introduction

On January 6, 2021, the U.S. Capitol building was breached by a group of protestors. Historically significant wood materials — doors, podiums, desks, and millwork — were stolen, damaged, or destroyed. Because of its prior efforts with inspection and preservation of historic structures, the USDA Forest Service, Forest Products Laboratory (FPL) was asked to help with repair efforts of the Capitol building. Specifically, FPL was asked to provide historically significant wood to those responsible for conducting the repair work.

The U.S. Capitol building (Fig. 1) is the meeting place of the U.S. Congress and the seat of the legislative branch of the U.S. federal government. It is located on Capitol Hill at the eastern end of the National Mall in Washington, D.C.

The original building was completed in 1800. It was partly destroyed in the 1814 burning of Washington, then was fully restored within five years. The building was later enlarged, with the addition of a massive dome and extended wings with expanded chambers for the bicameral legislature, the House of Representatives in the south wing and the Senate in the north wing. Similar to the principal buildings of the executive and judicial branches, the architecture of the Capitol is in the neoclassical style and it has a white exterior.

FPL has a long history of providing technical assistance to various departments and agencies of the federal government. FPL has provided advice on a variety of topics, from the development of innovative materials to the inspection and repair of historic structures and ships.

One of FPL's activities has been to focus on inspection and preservation of historic materials and structures (White and Ross 2014). One of the most notable efforts has been to provide inspection, repair, and design information for the USS Constitution, known as Old Ironsides. Launched in 1797, she is the oldest floating commissioned ship in the

Figure 1—U.S. Capitol building, Washington, D.C. (photo by tanarch – stock.adobe.com).

U.S. Navy (Witherall and others 1992, Ross and others 1998).

In this report, we provide the story of how FPL was connected to the Capitol building repair project, information on the company that originally supplied the lumber to FPL, technical information on the vintage lumber, and background information on the aircraft research that FPL conducted during WWI for the War Department, which was the original use for the lumber at FPL.

Connecting FPL to the Capitol Building Repair Project

The U.S. Capitol building was breached by a group of protesters on the afternoon of January 6th, 2021. Following the breach, Nathan Kamprath, a U.S. Army Ground Vehicle Systems Center (GVSC) engineer, observed damage to the historic mahogany millwork in post-breech assessment photos. During a previous visit to FPL, he noted a large quantity of vintage lumber in a remote storage stall in FPL's basement (Figs. 2 and 3). Kamprath then contacted FPL's Dr. Bob Ross, then acting Assistant Director and principal engineer, and also engaged with Architect of the Capitol Historic Preservation Officer Mary Oehrlein and Capitol Building Woodcrafter Jeff Hagan. Ross confirmed that FPL had a 3,000-lb (1,361-kg) stack of rare, legacy lumber believed to be part of materials used in FPL's early work for the War Department. This research determined properties and performance characteristics of wood propellers during World War I. The cache of lumber contained 78 boards with differing measurements. Individual weights and measurements of each board are given in Table 1. The Architect of the Capitol staff and leadership were thankful for the offer of this historic material and formally requested assistance from FPL (Appendix 1).

In response to the request, an interagency property transfer agreement was prepared and finalized to officially transfer ownership of the lumber from the UDSA Forest Service to the Architect of the Capitol. Work then began on transfer logistics. FPL contracted with a local shipper and, on February 25th, 2021, sent the lumber to the Architect of the Capitol. The bundle of lumber arrived at the Capitol less than a week later.

Figure 2—Vintage mahogany lumber when it was stored at the Forest Products Laboratory.

Ichabod T. Williams & Sons, Original Supplier of the Lumber

The lumber transported from FPL for use in the Capitol building repairs was stored on a shelf with a handwritten label "Filipino Mahogany". Within the stack on the storage shelf was a board, presumably from the original shipping crate, on which was stenciled in black paint the words Filipine Mahogany using the Spanish spelling of Philippine. Several of the lumber specimens in this stack had previously been identified as from the *Shorea* genus.

Included in the stack of lumber were two long boards with shipping information painted on them (Fig. 4) indicating that the lumber was shipped from I.T. Williams & Sons, New York.

The Ichabod T. Williams Company was founded in 1870 in New York city (Fig. 5). It would grow to become the largest firm for manufacturing and distributing fine hardwoods in the world, establishing offices in England, British Honduras, Nicaragua, Mexico, Colombia, Grand Bassam, Ivory Coast, and French West Africa. It also had agents in France, Belgium, and Germany.

In 1880, Ichabod T. Williams was joined in business by his oldest son, and his second son followed in 1882. The business was subsequently renamed Ichabod T. Williams and Sons. The company had main offices in various locations in the New York area over the years. In 1885, they purchased a half mile of waterfront property on the main ship channel in New York Bay, between Tompkinsville and

Figure 3—Lumber storage area at the Forest Product Laboratory where the vintage lumber was stored for more than 100 years.

Table 1—Physical characteristics of the lumber shipped from the USDA Forest Service, Forest Products Laboratory to the U.S. Capitol building in 2021

Board number	Weight (lb)[a]	Width (in.)[a]	Thickness (in.)[a]	Length (in.)[a]	Board number	Weight (lb)[a]	Width (in.)[a]	Thickness (in.)[a]	Length (in.)[a]
1	38	12 3/16	15/16	167	40	33.5	9 3/4	1	191 3/4
2	37	9 7/8	7/8	190 3/4	41	31.5	9	1	180 1/4
3	40.5	12 3/4	7/8	179	42	50.5	13 3/4	7/8	178 3/4
4	33	11 7/8	15/16	130	43	48	13	1	191 1/2
5	25.5	9 3/8	15/16	142 3/4	44	54	13	1	191 1/4
6	24.5	9 5/8	15/16	143 3/4	45	34	9 1/2	7/8	190
7	30	12	7/8	141 3/4	46	53.75	15 3/8	7/8	190
8	36.5	13 3/16	15/16	149 1/2	47	35.5	11 3/4	7/8	191 1/2
9	25.25	10 1/16	15/16	131 1/2	48	31	9 5/8	7/8	186 1/4
10	23.25	8 11/16	15/16	142 3/4	49	31.25	9 1/2	7/8	192
11	33	11 7/8	15/16	144	50	32	9 1/2	7/8	191
12	26.5	9 15/16	7/8	143	51	56	15	7/8	191 1/4
13	25	8 3/4	15/16	192 1/2	52	41	11	7/8	179
14	29	9 5/8	15/16	155 1/2	53	33.5	10 1/4	7/8	167 1/4
15	25	9 7/8	15/16	166 1/4	54	31.25	9 3/4	1	167 1/4
16	42.5	17 3/8	7/8	142 1/2	55	38	12 1/8	1	168 1/4
17	27	9	7/8	142	56	33	11 1/4	7/8	168
18	22.5	8 7/8	7/8	131	57	33.5	11 1/2	7/8	142
19	27.25	9 3/8	7/8	166 5/8	58	37	12 1/4	1	167 3/4
20	30.5	11 11/16	7/8	166 3/8	59	35	11 3/4	7/8	168
21	31	9 11/16	1	167 7/8	60	35	11 7/8	7/8	166 1/2
22	26.5	9 3/16	7/8	155 5/8	61	36	10 3/4	7/8	167 1/2
23	38.5	13 3/4	7/8	154	62	47.75	15 3/4	7/8	167
24	29.25	11 15/16	7/8	142 1/2	63	41.5	12 1/2	7/8	167 1/4
25	32.5	12 9/16	7/8	142 1/2	64	34	11	7/8	167 1/4
26	31.5	11 3/4	1	146	65	35	11 1/2	1	166 7/8
27	37.25	13 15/16	7/8	142 1/16	66	29.5	9 5/8	7/8	166 1/2
28	29.5	11 13/16	1	145 3/4	67	30.5	11	1	176 3/4
29	24.5	8 7/16	7/8	142 5/16	68	37.25	12	—	166 1/2
30	32.5	11 7/16	1	143 1/2	69	34.25	11 1/8	—	169 1/4
31	29	11 5/8	1	143 1/2	70	35.25	11 7/8	—	167 1/4
32	17.5	9 1/8	7/8	141 7/8	71	35	11 3/4	—	165 5/8
33	38.25	11 15/16	1	180 3/4	72	60	16 3/4	—	178
34	47.25	13 1/8	7/8	180 7/8	73	34	10 1/2	—	155 1/4
35	40.5	11 7/8	7/8	180 3/8	74	36	11 3/4	—	161 1/8
36	39	11 1/4	7/8	191 15/16	75	31.25	10	—	155
37	34.75	10 1/2	7/8	197 7/8	76	31	9 1/2	—	167 3/4
38	47.5	12 1/4	1	191 15/16	77	37 1/2	10 1/2	—	166 1/2
39	39	11 1/2	7/8	192 3/8	78	39 1/4	15 3/4	—	132 3/4

[a]1 lb = 0.45 kg; 1 in. = 25.4 mm.

Figure 4—Original packaging (cover board) showing shipping information (inset shows a close-up of supplying company information).

Stapleton, Staten Island. This would become the site of the largest hardwood and mahogany yards in New York city. Construction of the largest mahogany sawmill and veneer mill in the world (in Carteret, New Jersey) commenced in 1922 and continued until 1925. The business continued until the 1970s. In 1972, the plant was closed and the business ceased operations.

Background and Characteristics of the Wood Supplied by FPL

Philippine mahogany is a general term applicable to a range of species sourced in southeast Asia. Two other common names often interchanged with that name are meranti and lauan. Philippine mahogany, contrary to the name, is not a true mahogany. That title is more accurately used for tree species found in the *Swietenia* and *Khaya* genera. Meier (2022) states, "perhaps the species within the *Shorea* genus come the closest to genuine mahogany in terms of overall appearance and working properties."

Philippine mahogany is in the *Shorea* genus, which encompasses approximately 196 species in the mainly rainforest trees of the family *Dipterocarpaceae*. *Shorea* species are native in a range from northern India to Malaysia, Indonesia, and the Philippines. Growing up to 80 meters tall, they become dominant in tropical forests, especially in the Philippines and Malaysia.

The genus is named after Sir John Shore (1751–1834) who served as Governor General of the British East India Company from 1793 to 1798. Shore, the son of a British East India Company employee, was educated as a bookkeeper. In 1768, at age 17, he set sail for India working in various administrative roles in Calcutta (now Kolkata) until in 1793 he succeeded Marquess Charles Cornwallis as Governor General. For his service in India, he was granted the title of Baron Teignmouth upon his return to England in 1798. During Britain's colonial reign in India in the pre-industrial age, wood was an important commodity. Mann

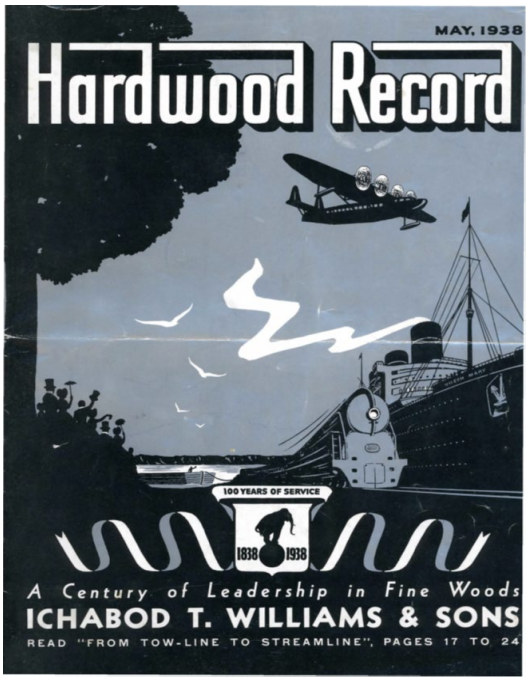

Figure 5—Cover of the "Hardwood Record", a wood industry trade magazine. The May 1938 edition highlighted Ichabod T. Williams & Sons company, supplier of the vintage wood used in the FPL wood propeller research that supported the U.S. War Department during WWI.

(2001) emphasizes the importance of wood regionally for fuel, boat making, construction, and global trade. Because it was named after Sir John Shore, one would assume that this group of wood species was considered valuable.

Mahogany is often associated with cabinet and furniture construction because of its attractiveness and resistance to shrinkage. In the early part of the 20th century, mahogany was sought out for a variety of aeronautical applications. Mahogany had many characteristics and properties that caused it to be coveted worldwide. One common use of mahogany was for airplane propellers.

Airplane propellers must have dimensional stability, high strength, clear grain, and consistent properties throughout the laminated structure. Several wood species were used for propellers: white oak, black walnut, black cherry, yellow birch, yellow poplar, sugar maple, hard maple, and mahogany (Clarke 1930, Moore 1924).

For some species, it was recommended that the wood be quartersawn to minimize shrinkage, but this requirement was not necessary for mahogany, which exhibited low shrinkage (U.S. Army 1921). Unfortunately, not all "mahogany" was true mahogany.

In 1914, wood described as "mahogany" was imported to the United States from Central America, Africa, and the Philippines. More than 37 billion board feet (87.3×10^6 m^3) of true mahogany was imported from Central America and

Mexico, more than 32 billion board feet (75.5 $\times 10^6$ m^3) of "African mahogany" was imported from Africa, and more than 700 million board feet (1.7 $\times 10^6$ m^3) of "Philippine mahogany" was imported from the U.S. Insular Government of the Philippine Islands (Mell 1917). Reviews of the visible and lens-magnified characteristics of many varieties of mahogany were performed by Record (1919) and Koehler (1922). From the reviews, it was apparent that different species under the name "mahogany" had significant structural differences among them. True mahogany (*Swietenia* spp.) is one of five different species of wood: *Swietenia mahagoni* Jacq., *Swietenia macrophylla* King., *Swietenia cirrhata* Blake, *Swietenia humilis* Zucco., and *Swietenia candollei* Pittier. African mahogany (*Khaya* spp.) is also one of five different species. In the Philippines, the genus, which includes the Philippine mahogany (*Shorea* spp.), is made up of more than 190 local species; however, the exported wood is largely made up of tanguile (*Shorea polysperma* Merr.), red lauan (*Shorea negrosensis* Foxw.), and almon (*Shorea eximia* Scheff.). As of 1922, mahogany, as a trade name, was used to describe more than 60 species of wood on the market (Koehler 1922).

The variety of wood species with the trade name "mahogany" complicated the process of characterizing the material properties of the vintage lumber found at FPL. In a report describing the role of the U.S. Forest Service during World War I, Clapp (1919) states that England, France, Italy, and the United States had secured mahogany from America, Africa, and the Philippines for use in propellers. Philippine mahogany was used extensively as a substitute for true mahogany by several propeller manufacturers of the U.S. Army's Air Service (U.S. Army 1921). There was success using Philippine mahogany when it was protected by metal tips, but the material was too soft to use without protection. In the same publication, the author comments that the material was of low grade and use of the wood had been ordered to be discontinued. Moore (1924) stated that true mahogany from Central America was suitable for propeller construction, but other varieties of mahogany tended to split and break and were generally unfit for propellers. The wide discrepancy in perception of material properties of Philippine mahogany was probably magnified by the lack of grading criteria and the number of countries harvesting it. Ponce (1939) described the mahogany harvesting conditions in the Philippines. Countries supporting harvesting included the United States, England, Spain, Belgium, Switzerland, China, Japan, and the Philippines. The wood was then shipped to the continental United States, Hong Kong, Canada, the Netherlands, Guam, Australia, the United Kingdom, China, Japan, British Africa, Hawaii, Italy, New Zealand, Norway, Denmark, Spain, Germany, France, Belgium, Dutch East Indies, Sweden, and Singapore. There was no grade law for exported Philippine mahogany. Exporters used their own graders or did not grade at all.

In Table 2, the material properties of several woods used in propeller construction are listed. One advantage mahogany had over many other wood species was a smaller amount of shrinkage during drying, which allowed propellers to keep their shape when ambient moisture conditions changed. The property values are from contemporary sources (Clarke 1930, Markwardt 1931, Heck 1937).

Table 2—Some physical and mechanical properties of woods used in propeller construction[a]

Species name			Shrinkage			Static bending		
Common	Botanical	Specific gravity	Radial (%)	Tangential (%)	Ratio (T/R)	Modulus of elasticity ($\times 10^6$ lb/in^2)[b]	Modulus of rupture ($\times 10^3$ lb/in^2)[b]	Side hardness (lb)[b]
Birch, yellow	*Betula alleghaniensis*	0.68	7.0	8.5	1.2	1.78	15.5	1,100
Cherry, black	*Prunus serotina*	0.53	3.7	7.1	1.9	1.33	12.5	900
Maple, sugar	*Acer saccharum*	0.67	4.8	9.2	1.9	1.60	15.0	1,270
Mahogany								
African	*Khaya* spp.	0.47	4.8	5.5	1.1	1.28	10.8	720
Philippine [c]	*Shorea* spp.	0.54[c]	4.6[c]	6.0[c]	1.3[c]	1.69	12.3	540
True	*Swietenia* spp.	0.51	3.4	4.7	1.4	1.26	11.6	790
Oak, white	*Quercus alba*	0.66[d]	5.2[d]	9.7[d]	1.8[d]	1.49	13.8	1,240
Poplar, yellow	*Liriodendron tulipifera*	0.43	4.0	7.1	1.8	1.30	9.1	420
Walnut, black	*Juglans nigra*	0.56	5.2	7.1	1.4	1.49	15.1	990

[a]Unless otherwise indicated, all properties come from Markwardt (1931).
[b]1 lb/in^2 = 6.9 kPa; 1 lb = 0.45 kg.
[c]Heck (1937).
[d]Clarke (1930).

Propeller Research Conducted at FPL for the War Department during WWI

The first national defense investigation at FPL was initiated in April of 1917, when FPL was contracted to determine the effect kiln-drying, steaming, and bending had on the strength of Sitka spruce and other airplane woods. Based on previous work at FPL, methods and specifications for kiln-drying green spruce and other woods were developed for the War Department's Signal Corps. After providing original specifications, FPL conducted an extensive series of studies to determine the effect of kiln-drying. By the end of 1918, 100 kiln runs on 26 species of airplane woods had been completed. These runs provided the material for the approximately 100,000 specimens that were tested to determine strength properties.

Around the same time, allotments from the War Department enabled FPL to undertake another important aircraft research project: the equipping and operation of an experimental propeller plant. This was the work that the vintage lumber was originally procured for. The central objective in propeller manufacture was to produce a propeller blade with sufficient stability to resist warp, twisting, and unbalancing of the blades with changes in humidity. Such defects had caused countless propeller failures. FPL established a special laboratory to investigate the problem. Begun in March 1918, the propeller research involved the manufacture, storage, and finishing of experimental propellers from seven species of wood under closely controlled conditions. Experimental propellers were produced at a rate of 10 a week, a schedule that called for a work schedule of three shifts per day.

A review of historical records leads us to believe that the impetus for FPL's propeller research, and its subsequent use, was raw material (wood availability) wartime supply challenges and in-field performance issues. At the time, aircraft were manufactured primarily from wood. A search of the literature for information on aircraft used during the World War I time frame revealed a wealth of information. The information presented was backed up by a series of reports published by FPL (Appendix 2). The following sections present what was found pertaining to World War I U.S. aircraft. Two of the most widely used U.S. aircraft were the Curtiss JN-4 (also known as "the Jenny") (Figs. 6 and 7) and the DH-4 Liberty Plane (Fig. 8).

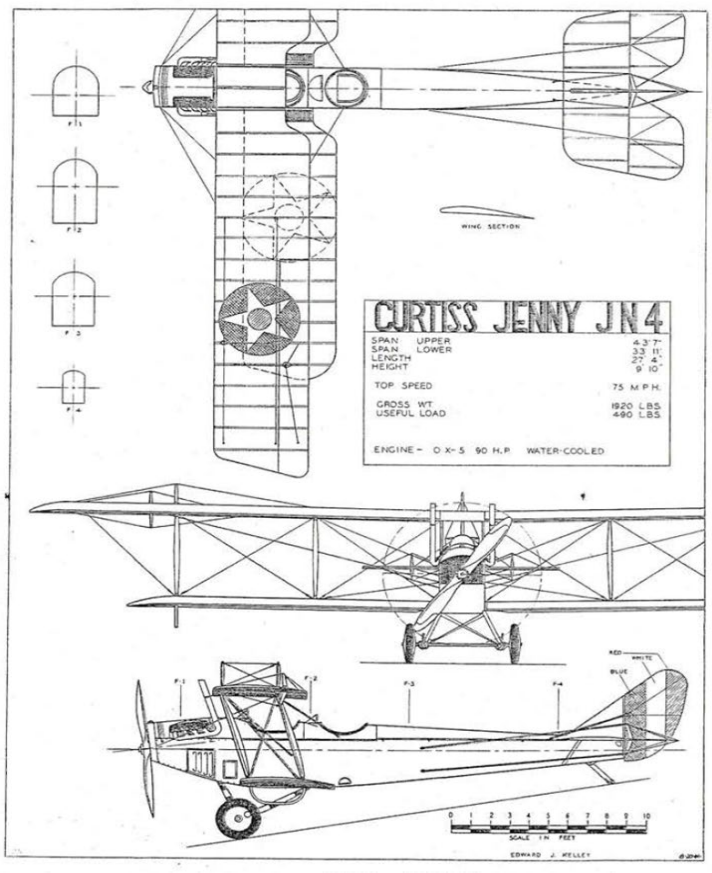

Figure 6—Blueprint for Curtiss JN-4 (the Jenny) (from Model Airplane News, March 1945).

Figure 7—Converted JN-4 ambulance, operated by the Camp Taliaferro medical teams around 1918 (photo from San Diego Air and Space Museum archives, public domain, via Wikimedia Commons).

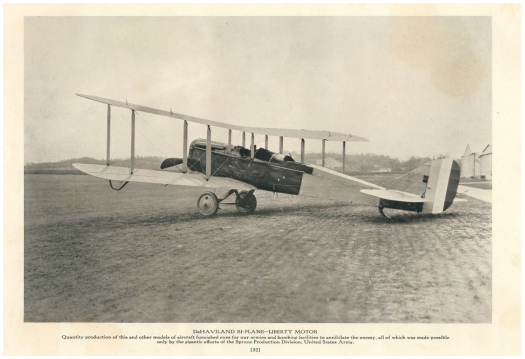

Figure 8—DH-4 Liberty Plane (This photograph of a Liberty plane comes from a book given to Spruce Production Division soldiers at the end of World War I. The book is now part of the Fort Vancouver National Historic Site museum collection. National Park Service photo).

Curtiss JN-4

The Curtiss JN-4 is possibly North America's most famous World War I aircraft. It was used during World War I to train almost all pilots (an estimated 95% of all trainees flew a JN-4). The U.S. version was called "Jenny", a derivation from its official designation. It was a twin-seat (student in front of instructor) dual-control biplane. Its tractor propeller and maneuverability made it ideal for initial pilot training with a 90 hp (67 kW) Curtiss OX-5 V8 engine giving a top speed of 75 mph (121 km/h) and a service ceiling of 6,500 ft (2,000 m). The British used the JN-4 (Canadian), along with the Avro 504, for their primary World War I trainer using the Canadian Aeroplanes Ltd. indigenous variant. Many Royal Flying Corps pilots earned their wings on the JN-4, both in Ontario and later in winter facilities at Camp Taliaferro, Texas.

Although a training aircraft, the Jenny was extensively modified while in service to undertake additional roles. Because of its easily adaptable structure, the Canadian Jenny was modified with a ski undercarriage and was flown year-round. The removable turtle deck behind the cockpits allowed for a stretcher or additional supplies and equipment storage, allowing modified JN-4s to become the first aerial ambulances, carrying out this role both during wartime and in later years. Most of the 6,813 Jenny's built were unarmed, although some had machine guns and bomb racks for advanced training purposes. Deployment was limited to North American bases; none saw combat service in World War I.

DH-4 Liberty Plane

The DH-4 Liberty has the distinction of being the only American-built airplane to be flown in combat in World War I by American crews. This bomber, designed by British aviation engineer Geoffrey DeHavilland, first flew into combat with the British Royal Flying Corps in early 1917. When the United States joined the war in April of that year, one was sent to the United States to determine if it was suitable for American production.

The American Aircraft Production Board approved the design for construction in July 1917, pairing it with an American-designed V-12 "Liberty" engine. Because of this, American DH-4 planes were known as "Liberty Planes." The first Liberty Plane rolled out of an American factory on October 29, 1917.

The DH-4 biplane had a wood frame covered with fabric. Spruce wood was preferred for manufacturing airplanes because it was both strong and light. The need for dependable supplies of spruce drove the formation of the U.S. Army's Spruce Production Division, headquartered at Vancouver Barracks (Vancouver, Washington, USA) (Fig. 9), which is now Fort Vancouver National Historic

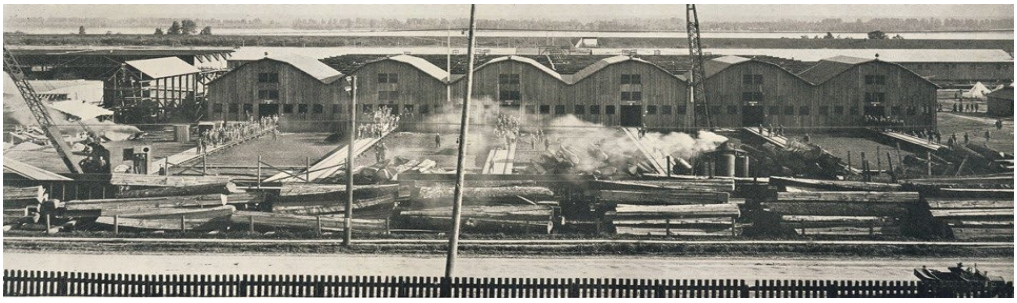

Figure 9—Built in 1917, the spruce mill at Vancouver Barracks (Vancouver, Washington, USA) was the largest of its kind in the world and was responsible for the production of millions of board feet of lumber specifically for aircraft production (National Park Service photo).

Site. The nearly 30,000 soldiers of this division operated lumber camps, railroads, and three large sawmills (the largest of which was at Vancouver Barracks), to specifically cut Sitka spruce for aircraft production in the United States, as well as in Great Britain, France, and Italy.

After training crews flew them in the United States, the first DH-4 Liberty Planes were delivered to France on May 11, 1918. The aircraft served with distinction in the autumn of 1918 during the Meuse-Argonne campaign, conducting both strategic and tactical bombing raids on German targets. By the end of the war on November 11, 1918, a total of 1,213 Liberty Planes had been delivered overseas for the war effort. Between October 1917 and the war's end, 4,846 total Liberty Planes had been constructed in the United States — an incredible figure in just more than a year's time. After the Armistice, they became the basis of the Army Air Service's fleet of combat-ready aircraft.

Surrounding Media

The fact that FPL assisted in the U.S. Capitol building repair effort created a positive national conversation and media news coverage. The following summarizes the media coverage regarding the project:

Doug Moe, Madison Magazine/Channel 3000, March 29, 2021.

Chris Cioffi, CQ Roll Call, April 15, 2021.

Tom Putnam, Independent film, April 5, 2021.

Matthew Cash, Senior Executive Producer, WKOW Channel 27 News, April 5, 2021.

Savanna Tomei, Reporter, Spectrum News 1, Madison Bureau, April 17, 2021.

Chris Hubbuch, Energy and Environment Reporter, @Madison.com. Wisconsin State Journal, April 17, 2021.

Shelly Pittman, WROT 89.9 FM. On-air live interview, April 23, 2021.

Jamie Perez, Reporter, Channel 3000. April 27, 2021.

Dean Knetter, Wisconsin Public Radio, Central Time, On-air interview, April 26, 2021.

Summary

The project described in this report was the collaboration of many with the intention of healing and restoring the damages done to the U.S. Capitol building during the January 6th, 2021, breach. It was wholly performed in service to the people of the United States.

Under the leadership of USDA Forest Service, its Forest Products Laboratory, and the U.S. Army, a shipment of World War I era lumber was secured and shipped to the Architect of the Capitol for the repair and restoration efforts. The rapid response to the need was the result of a seamless collaboration between federal government departments and agencies. The act of supplying the lumber garnered notable positive media attention throughout the United States.

Agency leadership was instrumental in the effort and was notably proud of the accomplishment. FPL's station director, Dr. Cynthia West, commented that "FPL has a long history of significant contributions to our nation since its establishment in 1910. During World War I, we worked with the DOD to improve airplane construction and parts. We are proud to offer a piece of the laboratory's history that was used in the defense of our country to now repair our U.S. Capitol building, the seat of our democracy. Today, our work has grown from these early roots as we advance research towards a sustainable future by developing renewable wood-based building solutions and new materials from wood."

Upon receipt of the shipment, Architect of the Capitol J. Brett Blanton stated, "I'm humbled and so appreciative of the support from the United States Forest Service. The mahogany provided by the U.S. Forest Service is invaluable and will be used by the Architect of the Capitol to restore historic millwork in our nation's temple of democracy."

Jeffrey Hagan, U.S. Capitol Woodcrafting division, summarized the authors' sentiments best: "The lumber is exactly what we could use, and we are very grateful for the opportunity to acquire these hidden gems…. This is such a great gift to the U.S. Capitol to help rebuild the damage that we have sustained."

Acknowledgments

The authors are grateful to the following individuals who assisted in the effort of getting the vintage lumber to the U.S. Capitol building:

From the Architect of the Capitol, Laura Condeluci, Shola Matthews-Aroloye, and the Capitol police.

From USDA Forest Service, Julie Blankenburg, Douglas Clawson, Katherine Drake, Robert Echternach, Keven Kramer, John Minter, Steven Norland, Robert Ramos, Colleen Reittinger, Randy Wruck, Lon M. Yeary, Michael Wiemann, and Thomas Eberhardt.

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State University; Xiping Wang, Research Forest Products Technologist, USDA Forest Service, Forest Products Laboratory; and Ted Wegner, Assistant Director (retired), USDA Forest Service, Forest Products Laboratory.

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Appendix 1—Formal Request for Assistance

ARCHITECT OF THE CAPITOL

Architect of the Capitol
U.S. Capitol, Room SB-16
Washington, DC 20515
202.228.1793

www.aoc.gov

January 21, 2021

Robert J. Ross, PhD
Acting Assistant Director
USDA Forest Service - Forest Products Laboratory
One Gifford Pinchot Drive
Madison, WI 53726-2398

Dear Dr. Ross:

On Wednesday, January 6, 2021, the U.S. Capitol was the target of a violent attack. The U.S. Capitol was ransacked and vandalized, resulting in significant damage to many historically significant artifacts and office spaces. Of note were the loss and destruction of many legacy wooden objects, including doors and intricate millwork, moldings, desks and podiums. Nathan Kamprath, U.S. Army DEVCOM, indicated that the Forest Products Laboratory (FPL), through the Department of Defense, may be able to assist with the repair process. He spoke highly of the FPL's history of research and development in the wood science and engineering field and the excellent service FPL has provided to other government agencies and departments.

Based on our correspondence this week, the U.S. Capitol is requesting the following:

- Technical assistance: request consulting services to include anatomical speciation of wood materials, including lumber and millwork; historical research to establish, where possible, significance and provenance; assistance with interpretation of appropriate physical and mechanical property information and other wood science technical information required to aid with millwork repairs and applications.
- Legacy materials: sizable, clear old-growth mahogany of the high quality originally utilized in the U.S. Capitol is no longer available and/or of protected international conservation status. As such, alternatively sourced legacy mahogany stock is required. To this end, the Architect of the Capitol requests interagency property transfer of any surplus legacy material for our use. Based on our discussions, we believe that FPL has material that possibly dates to studies conducted in the early 20th century (1919 vintage) for the U.S. Army Air Service on the in-field performance of laminated wooden propellers. This surplus material is of incalculable value and is worthy of U.S. Capitol installation.

We sincerely appreciate your quick response to our request during this trying time and look forward to working further with FPL. If you require more information, please contact Shola Matthews-Aroloye at 202-441-3450, smatthew@aoc.gov.

Sincerely,

Harold Honegger

Harold J Honegger
Chief, Supplies, Services and Material Management Division

Doc. No. 210121-02-01

Appendix 2—Additional Sources of Information

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