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Forest Service Lab's Files Shed Light on Hughes and His Airplane Forest Products Lab Researchers Consulted on Adhesives, Woods and Preservatives

Madison, Wis.— “Howard Hughes of Hughes Aircraft Co. telephoned from Washington on October 22 . . . The call came in about 5:00 P.M.”

Thus begins a memo to the file, dated Oct. 25, 1943, from George M. Hunt, chief of the division of wood preservation at the U.S. Forest Service's Forest Products Laboratory (FPL). [In three months, Hunt would become assistant director of FPL, and in 1946, director.]

“He [Hughes] is greatly concerned about attempts that he says are being made to cancel the contract for making the huge flying boat, the H K 1, that he and Kaiser [industrialist Henry J.] are now developing under Government contract,” Hunt wrote.

According to Hunt, Hughes said that cancellation of the contract or a change from wood to metal would give a permanent black eye to the use of wood in airplanes.

Hughes' obsessive effort to build the world's largest airplane—widely (and somewhat cynically) known as the “Spruce Goose”—is dramatized in the highly acclaimed movie *The Aviator*. Less dramatically perhaps, an old file at FPL also sheds light on the man and his machine.

Hughes told Hunt that Sherman Fairchild had suggested he contact FPL for help defending the concept of a wooden plane. Fairchild, a friend of Hughes, was a successful inventor and airplane designer and builder. A year earlier, in August 1942, FPL, at the request of airplane manufacturers and the Army, Navy and Civilian Aeronautics Board, had published *A Wood Aircraft Fabrication Manual* and an *ANC Handbook on the Design of Wood Aircraft Structures*. And Hughes' engineers had contacted FPL for assistance in testing wood specimens and adhesives as early as January 1941. Understandably, FPL seemed the logical place to seek help.

Hughes said he needed factual information for a hearing scheduled the following week in Washington. "Hughes asked if we could send a man to Washington right away at his expense to bring samples and data bearing on

1. The durability of glue joint exposed to water.
2. The rate of water absorption or weight increase through finishes, such as might have been learned from studies of boats.
3. Resistance of glue joints to gasoline, oil, water, weather.
4. The relative suitability of spruce and birch for the job.
5. All other information that would have a bearing on the suitability of wood for this job."

Hunt wrote that he told Hughes that "we are not in position to say that wood is the best material for this job. All we could do is to state the facts as we see them."

Hughes "said that facts is all he wants," Hunt wrote.

Hughes, according to Hunt's memo, urged Hunt to get to Washington Sunday if possible—the phone conversation took place Friday. When Hunt suggested that FPL might want to send more than one man, Hughes replied, "Send all the men you want."

The two men agreed to talk again the next day, Saturday. When Hughes called Hunt early Saturday evening he told Hunt that the hearing had been postponed and the government would continue funding, permitting him to continue with wood for at least another 30 days. Instead of Hunt going to Washington, Hughes would send someone to FPL for several days to collect information that might be helpful.

Hughes called Hunt again later that evening.

"In the second call he apologized again for making us so much trouble and expressed his appreciation for our willingness to help," Hunt wrote.

Hunt's memo supports Hughes' reputation for attention to detail. Recounting that second phone conversation Saturday evening, Hunt wrote, "I told him that we have some doubt about the suitability of urea glue and would prefer to see a phenolic glue used in production although urea glue would be all right for static tests. He [Hughes] seemed surprised and interested but stated that on some parts they could not get heat to the joints. I told him that there is hope that we will soon have phenolic glues that will set satisfactorily with very little heat."

Hunt also wrote that he suggested that FPL "might be more helpful if some of our men could consider other phases of the problems of using wood and glue in this plane by visiting his plant and getting first hand information on them. He was interested and offered to pay expenses if they would come."

Hunt's memo concludes: "We may thus have a good opportunity to dig beneath the surface a little and possibly to do them some real good on their wood engineering, selection, handling, and gluing practices."

As it turned out, FPL personnel were involved with the Spruce Goose off and on for the next seven years. By the end of 1943, FPL's assistance had also been recruited by the Civil Aeronautics Administration team that was monitoring the Hughes' project in California. Even after the mammoth plane's short, historic flight in November 1947 and the eventual cancellation of Hughes' government contract, FPL remained engaged in the project. Filed letters and memoranda recount on-site visits to California and continuing discussions of various modifications and adhesives as late as 1950, while the giant plane lay in storage in a specially built, air-conditioned hangar.

In 1975, when word reached FPL that the plane was to be dismantled, the lab requested some pieces. The plane was saved from demolition, however, and a few years later was placed on display intact in a waterfront museum. Today, all FPL has to show for its efforts are a musty correspondence file and some photos of the plane under construction.

The USDA Forest Service Forest Products Laboratory was established in 1910 in Madison, Wis., with the mission to conserve and extend the country's wood resources. Today, FPL's research scientists work with academic and industrial researchers and other government agencies in exploring ways to promote healthy forests and clean water, and improve papermaking and recycling processes. Information is available at FPL's Web site: www.fpl.fs.fed.us. Through FPL's Advanced Housing Research Center, (www.fpl.fs.fed.us/ahrc/), researchers also work to improve homebuilding technologies and materials.

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