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by Whitney Adrienne Snow

Between 1928 and 1969, domestic farmers attempted to forge a place for tung oil in popular culture by using trade journals, newspapers, festivals, fairs, beauty pageants, football bowls, parades, and postcards as well as promoting the product through music, radio, and television but achieved only moderate success. These sources of publicity managed to create a small niche for the tung tree as a coastal attraction for tourists, but because of its confinement to the Gulf Coast, the inability to sell the poisonous nuts as table fare, and the scientific complexities of many journal and newspaper articles, tung never became a national icon. Although tung oil may have only achieved nominal mass recognition, its story illustrates the challenges facing an inedible crop in advertising campaigns, the varying forms of and changes in southern tourism, and myriad ways memory preserves the last vestiges of a bygone industry.

Origins of the Tung Industry

During a 1902 trip to Canton, China, David G. Fairchild, plant explorer and head of the Section of Systemic Seed and Plant Introduction (SPI) of the United States Department of Agriculture (USDA), sparked a series of events that introduced tung to American soil. The son of an abolitionist minister and teacher, Fairchild had worked in the USDA Division of Vegetable Pathology, studied German fungi, and married Marian Bell, the daughter of Alexander Graham Bell. Seeking exotic plants, he then embarked on a journey to Java and the Pacific that

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resulted in his introducing a plethora of species to the U.S.[1] An avid ecological cosmopolitan, Fairchild said, "… the whole trend of the world is toward greater intercourse, most frequent exchange of commodities, less isolation, and a greater mixture of the plants and plant products over the face of the globe."[2] In the case of tung, Fairchild wrote of the tree in his records but later stated, "I was not able to see the trees from which this interesting oil was secured," so "the idea of its introduction dropped from my mind."[3] Ironically, the key assist for tung came not from Fairchild, who nevertheless received primary credit in subsequent tung trade journals and newspaper articles, but from a diplomat.

In 1902, 1903, and 1904, L. S. Wilcox, U. S. Consul General to China, sent hundreds of nuts to a party in the San Joaquin Valley in California, but none of the resulting saplings survived due to inattention and drought. Determined, Wilcox sent 200 pounds of tung seeds during the spring of 1905, this time to the United States Department of State (USDS).[4] When the nuts came into possession of the USDA's Bureau of Plant Introduction, Fairchild sent them to the Plant Introduction Gardens of the Division of Foreign Plant Introduction at Chico, California, and Miami, Florida.[5] In 1906 and 1907, the stations sent 800 trees to interested parties, including individuals, state experiment stations, and gardeners in California, Alabama, Florida, Georgia, Louisiana, Mississippi, Texas, and South Carolina in an attempt to

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[1] Philip J. Pauly, *Biologists and The Promise of American Life: From Meriwether Lewis to Alfred Kinsey* (Princeton: Princeton University Press, 2000), 88.

[2] Ibid.

[3] David G. Fairchild, "The Chinese Tung Oil Tree," 13, manuscripts (presumably unpublished), SB359.F3, David Fairchild Collection, Fairchild Tropical Botanic Garden Archive, Miami, FL.

[4] "Seeds and Plants Imported During the Period from December, 1903 to December, 1905," no. 13104, *United States Bureau of Plant Industry Bulletin* 97 (December 1903-December 1905), 129; Florida Department of Agriculture, "Tung Oil: One of Florida's Greatest Potential Resources," *State of Florida Department of Agriculture Bulletin* 11 (May 1942): 12; Workers of the Writers' Program of the Works Projects Administration in the State of Florida, "Tung Oil: An Essential Defense Industry," *State of Florida Department of Agriculture Bulletin* no. 11 (Jan. 1942): 5; and Albert E. Cowdrey, *This Land, This South: An Environmental History* (Lexington: University Press of Kentucky, 1996), 171.

[5] C. C. Concannon, "Tung Oil: Economic and Commercial Factors in Development of a Domestic Tung Oil Industry," no. 133, *U.S. Bureau of Foreign and Domestic Commerce Trade Promotion Series 132-133* (Washington, D.C.: United States Government Printing Office, 1932), 35, 62-64; and Tung Oil 1, no. 1 (Oct. 1930): 12.

discover locations and conditions in which tung could thrive.[6]

Farmers across the country embraced the exotic tree much as they did other diversification crops like soybeans, sweet potatoes, pecans, oranges, lemons, peaches, pomegranates, grapefruits, kumquats, bananas, figs, coconuts, guavas, grapes, strawberries, rice, sugarcane, pineapples, peanuts, tomatoes, and satsuma oranges. Unsurprisingly, farmers and lumbermen lacked knowledge on how to care for these new plants and lost entire crops to freezes. Despite obstacles, they persevered in the hopes of maximizing both land use and profits.[7] In the case of tung, growers planted trees as far east as Florida, as far west as California, and as far north as New York. Although not all of these lands proved conducive, tung took root on an unlikely strip of land suited to little but pine.

After years of trial and error, USDA experts concluded that the tung tree could best grow along the Gulf Coast stretching from the Florida Panhandle to southeastern Texas. Because of droughts, they abandoned the idea of California as a tung haven. They had also realized that frosts impeded tung cultivation in the North. While tung trees were known to grow in gardens in northern states, any notion of commercial orchards was deemed too risky. As a matter of fact, few scientists believed tung could be successfully grown further than 100 miles from the Gulf. [8] USDA officials had great hopes for their target strip—the Tung Belt. They saw tung not only as a way to fuel diversification efforts that would not only benefit the southern economy but also reduce erosion of cut-over pinelands. Not only would tung grow in the sub-par soils of the pine regions, but it would beautify

[6] Fairchild, "The Chinese Tung Oil Tree," 3; Concannon, "Tung Oil," 35, 62-64; Tung Oil 1, no. 1 (Oct. 1930): 12; "New Varnish Oil," *Miami Herald Record*, August 21, 1913, 8; and John M. Scott, "Tung Oil: A New Industry in Florida," *State of Florida Department of Agriculture Bulletin* no. 11 (Jan. 1929): 4. See also, "Seeds and Plants Imported during the period from July 1906 to December 31, 1907," *Bureau of Plant Industry Bulletin* no. 132 (Washington, D.C.: Government Printing Office, 1908), 132.

[7] On diversification, see, Brian Rucker, "Satsumaland! A History of Citrus Culture in West Florida," *Gulf Coast Historical Review* 12, no. 1 (Fall 1996): 61-77; E. G. Nourse, "The Cheapest Source of Increased Food Supplies," The Scientific Monthly 6, no. 2 (Feb 1918): 122-123; and Louise K. Frisbie, *Yesterday's Polk County* (Miami: E. A. Seemann Publishing, Inc., 1976), 27. On crop intransigence in the south, see, for example, Arthur F. Raper and Ira De A. Reid, *Sharecroppers All* (Chapel Hill: University of North Carolina Press, 1941), 194.

[8] Fairchild, "The Chinese Tung Oil Tree," 11.

the barren land one newspaper writer referred to as "stump country."[9]

A veritable craze swept the South as farmers and would-be absentee farmers embraced tung. Classified ads praising tung as a hands-off money maker fueled imaginations and expectations. Many farmers imagined that all they had to do was plant a tung tree, wait three or four years, harvest the nuts, and reap the profits.[10] Some of the earliest tung trees were planted in Florida and Georgia, and acreage spread as more and more Americans began to equate tung with dollar signs.[11] Proven businessmen like J. C. Penney and Thomas Morrison Carnegie, Jr., nephew of famed industrialist Andrew Carnegie, planted tung.[12] In 1925, Henry Ford purchased almost 70,000 acres in Georgia and Florida, most near Savannah, with the aim of testing plants like tung. Several years later in 1929, he formed a research lab at Ways Station in Georgia, where its scientists performed many studies on tung. The overarching goal remained consistent: escaping import dependence through self-sufficiency for his company and the nation. Fairchild believed Ford just the man to lead the country in scientific experimentation, mechanization, and proficiency.[13] Ideally, if the U. S. could increase its tung acreage to a sustainable level, the country would no longer be as dependent on China. Southern growers had obstacles to overcome if they intended to reach this lofty goal because

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[9] "East Texas Farmer, 74, Rides The Range, Grows Tung Trees, Not Afraid to Try Experiments," *Dallas Morning News*, Aug. 14, 1939, Sec I., 8.

[10] See, "The Chinese Wood-Oil Tree," *San Jose Mercury News,* July 19, 1914, p. 18; "Wood-Oil Tree in The United States," Drug & Chemical Markets 3, no. 1 (Sept. 13, 1916): 9; and Earley Vernon Wilcox, *Tropical Agricultural: The Climate, Soils, Cultural Methods, Live Stock, Commercial Importance and Opportunities of the Tropics* (New York: D. Appleton, 1916), 264.

[11] "3 Georgia Farmers Given Recognition," *Augusta Chronicle*, August 15, 1935, p. 2; and "University Honors Three Prominent Georgia Farmers," *Marietta Journal*, August 22, 1935, p. 7.

[12] "The Penny Farms in Florida," *Augusta Chronicle*, December 19, 1926, p. 6; and "Tests Out Trees as Oil Producer," *Trenton Evening Times*, November 7, 1928, p. 19. The Penney-Gwin Corporation land holdings in Collier County, Florida, included sixty acres of tung. On J. C. Penney, see also, Maury Klein, *The Genesis of Industrial America, 1870-1920* (New York: Cambridge University Press, 2007), 120. Carnegie grew tung on his Dungeness Plantation on Cumberland Island, Georgia, and leased a tung plantation in Monticello, Florida. On Carnegie, see, Charles Seabrook, *Cumberland Island: Strong Women, Wild Horses* (Winston-Salem, NC: John F. Blair, Publisher, 2004), 160.

[13] Reynold M. Wik, *Henry Ford and Grass-roots America* (Ann Arbor: University of Michigan Press, 1972), 12, 147; Neil Baldwin, *Edison: Inventing the Century* (New York: Hyperion, 1995), 380; and "Ford Plants Tung Oil Trees in Georgia," *Augusta Chronicle*, October 21, 1943, p. 3.

the U. S. did not even have a tung nut crushing mill until Benjamin Moore & Company, owner of 1,800 acres of tung trees in Alachua County, Florida, opened the Alachua Tung Oil Mill on December 14, 1928. [14] More mills appeared in the following decades as tung acreage grew, and growers constantly recruited new tung farmers to increase their ranks.

Marketing the Tung Tree

The appealing qualities of the tung tree and tung oil aided growers in advertising campaigns.[15] The bark on young trees shone bright lime green while that of older trees developed a gray bark that was almost smooth to the touch. The fruits or shells encasing the nuts had a gorgeous bright green hue which became bright, apple red when ripe. The brown, pear-shaped nuts grew large, almost as big as baseballs, and would easily fit into the palm of the hand. The multi-colored blossoms, while not particularly fragrant, seemed to play tricks on the eye, changing colors from pink to white and yellow.[16] Since tung oil ranged in color from clear to rust, some admirers dubbed it liquid gold. All of these traits fueled marketing methods.

Promoting the country's little-known Tung Belt became the main priority of tung trade journals. *Tung Oil* (1930-1933), *American Tung Oil* (1935-1937), *American Tung Oil and the Southern Conservationist* (1938-1941), *American Tung Oil News* (1934-1935), *Tung World* (1946-1969), *American Tung News* (1953-1969), and *American Tung Oil Topics* (1954-1968) printed visual aids in the form of photographs of trees, blossoms, and nuts on almost every page. Alongside the images appeared detailed, informative articles on the cultivation and utilization of tung trees and tung oil in the hopes of fueling the domestic tung oil industry. These writings explored the planting and care of trees as well as the harvesting, milling, and marketing of oil. Convincing the masses of the tree's importance to everyday life remained of the utmost

[14] "Alachua Tung Oil Mill Oldest in Country," *Tung World* 1, no. 2 (June 1946): 19.

[15] A. L. Matthews, "Vegetable Drying Oils," *Tung Oil: A Magazine Devoted to the Development of the American Tung Oil Industry* 1, no. 2 (Nov. 1930), 6. See also, C. C. Concannon, "Tung Oil: Economic and Commercial Factors in the Development of a Domestic Tung Oil Industry," no. 133, U.S. Bureau of Foreign and Domestic Commerce Trade Promotion Series 132-133 (Washington, D.C.: United States Government Printing Office, 1932), 41, 2-6, 20.

[16] Lynn Crosby Gammill, Hattiesburg, Mississippi, interviewed by author, April 3, 2012, tape recording.

importance, and contributors never missed a chance to mention the plethora of its uses, including paint and varnish, ink, chemical, and insulation to name a few. Such advertisements on tung took many other forms.

Countless pamphlets, articles, newspapers, and books highlighted the contributions tung made to the country and its citizens. An American Tung Oil Institute (ATOI) pamphlet "Why Should You Use Tung Oil" proved immensely popular.[17] In order to make tung nationally recognizable, growers sought an inclusion of tung in both *Webster's Dictionary and The World Almanac* and in magazines like *Harper's News Monthly and National Geographic*.[18] Other accomplishments came in the form of tung items in *The New York Mirror, New York Post,* and *New York Times*.[19] Works Progress Administration guides to the states mentioned the growing importance of tung trees.[20] During WWII, *The Billboard*, an entertainment magazine, *Boys' Life*, the official magazine of the Boy Scouts of America, and *The Kiplinger's Magazine* discussed the importance of tung oil to the war effort.[21] In 1953, the Southern Regional Research Lab produced an 825-page, four-volume "Abstract Bibliography of the Chemistry and Technology of Tung Products, 1875-1950," which included 3,000 sources spanning three-quarters of a century.[22] The American Tung Oil Association (ATOA) even published a cookbook called "Use Your

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[17] "Tung Oil Booklet Has Telling Story," *News for Farmer Cooperatives* 26, no. 4 (July 1959), 23.

[18] "Dictionary, Almanac Omit Data on Industry," *Tung World* 2, no. 3 (July 1947), 5; Roger Burlingame, "Rainbow Over the Farm," *Harper's Magazine* (Dec. 1939), 50; and "National Geographic Notes Tung Industry," *Tung World* 2, no. 5 (Sept. 1947), 12.

[19] See, for example, "N.Y. Mirror Buys Story on Tung Oil," *Tung World* 1, no. 11 (Mar. 1947), 15.

[20] Workers of the Writers' Program of the Works Project Administration in the State of Louisiana, *Louisiana: A Guide to the State* (NY: Hastings House, 1941), 458; Workers of The Writers' Program of The Work Projects Administration in the State of Georgia, *Georgia: A Guide to Its Towns and Countryside* (Athens: The University of Georgia Press, 1940), 64; and Federal Writers' Project of the Works Progress Administration, *Mississippi: The WPA Guide to the Magnolia State* (Jackson: The University Press of Mississippi, 1938, reprinted 1988), 111.

[21] "Major Crops for the South," *The Billboard* 55, no. 13 (March 27, 1943), 75; "Food Will Win War; Peace" *The Billboard* 54, no. 1 (Jan. 3, 1942), 54; Eva Beard, "Your Farm Job," *Boys' Life* 33, no. 6 (June 1943), 18; and "Your Questions Answered," *The Kiplinger Magazine* 3, no. 12 (Dec 1949), 28.

[22] "Mississippi Now Leading in the Tung Oil Industry," *Jackson Daily News*, June 8, 1954.

Tung," which included numerous tasty dishes sans tung because of its toxicity.[23] Americans were exposed to tung in museums like the United States National Museum, and some saw tung in paintings like Xavier Gonzalez's Works Progress Administration (WPA) Tung Oil Mural at the Covington, Louisiana, Post Office.[24] Radio stations cross country also covered the domestic tung oil industry.[25] Aside from these mediums, the masses also gained a connection to tung through government projects, charities, and education.

Tung presented a way to aid the needy and to beautify the landscape. Federal Emergency Relief Administration (FERA) tung colonies benefitted many during the New Deal.[26] Also during the 1930s, growers L. O. Crosby and Lamont Rowlands donated 1,000 acres of tung, and the Rehabilitation Corporation of Mississippi provided another 8,000 acres of tung to Whitworth College in Brookhaven, Mississippi.[27] This move struck the Mississippi Board of Trustees of the Institutions of Higher Learning as a great idea for all its colleges'

[23] Mrs. David Goodyear, interviewed by author, September 9, 2011, tape recording.

[24] "Report on The Progress and Conditions of The United States National Museum for the Year Ending June 30, 1917 (Washington, D.C.: Government Printing Office, 1918), 69; Richard Megraw, *Confronting Modernity: Art and Society in Louisiana* (Jackson: University Press of Mississippi, 2008), 77, 82-83; Erika Katayama, Xavier Gonzalez (M.A. thesis, University of California at Santa Cruz, 2009), 1-2, 8; John R. Kemp, "Survivor of the WPA Era," *The States-Item,* May 27, 1988; and Lillian Galt, "Artist Couple Proves Life Not Stormy," *Times-Picayune*, June 4, 1939, p. 30.

[25] See, for example, "The Tung Oil Industry in the South," *Rockford Register-Republic* [Illinois], July 6, 1938; "Radio Address on Tung Oil," *Dallas Morning News*, November 14, 1937, Section II, p. 7; and "Lamont Rowlands," *Tung World* 7, no. 10 (March 1953), 7. See also, "N.Y. Housewives Learn About Tung," *Tung World* 2, no. 10 (Feb. 1948), 15. Tung received some television coverage. See, for example, a WDSU-TV in New Orleans story that aired on August 20, 1959. See, "T.V. Covers Story on Tung Oil," *American Tung News* 10, no. 9 (Sept. 1959), 17.

[26] H. W. Bennett, "Tung Oil Industry Expands," *Manufacturers' Record* 103, no. 11, Nov. 1934, 26. See also, "Expanding Tung Oil Tests," February 24, 1935, Tung Oil, Vertical File, Hargrett Rare Book and Manuscripts Library [hereafter VF, HRBML, UGA]; Emerson Ross, "Research and Statistical Program of the Federal Emergency Relief Administration," *Journal of the American Statistical Association* 29, no. 187 (Sept. 1934): 228-294; "Tung Oil May Help Support Southerners," *Augusta Chronicle*, October 24, 1934, 1; "American Invasion of Tung Oil Field Perils Chinese Monopoly," *Trenton Evening Times*, February 10, 1935; and "Government Plans Tung Cultivation for Mississippi," *Dallas Morning News*, December 20, 1936, Section V, 1.

[27] "Mississippians Told of Tung Oil Trees, Valuable New Crop; and Tung Tree Culture Spreads," August 17, 1935, Tung Oil, VF, HRBML, UGA.

incomes and encouraged further donations.[28] Tung trees began to adorn the campuses of several southern universities like the University of Florida which prided itself on a diverse array of plants. In such instances, the colleges emphasized the foreign nature of the unique trees.[29] This exoticism played a significant role in tung advertising.

Numerous articles, such as "Tung Oil: Gift of the Orient" and "China's Tung Trees Make Good in America," mentioned tung's Chinese origins.[30] Many articles insisted that the very name tung meant heart in Chinese, and while this claim was erroneous, the rumor persisted, perhaps as an advertising angle. The China connection perhaps added to the mystery, uniqueness, and appeal of tung trees. One article insisted that tung trees transplanted "a touch of the soft and gentle beauty of Old China" to the U. S.[31] Another article called it "a gift from China."[32] At the same time people sought the different, the other, and the strange, they spurned all things foreign.[33] While growers milked the Chinese connection, they billed the tung tree as pure "American." They preferred to think that the U.S. had taken rather than been given the tung tree. Evidently, they used the Chinese tie only when convenient and never failed to argue that through superior cultivation and utilization methods, the U.S. had made tung its own.

Tourism and Tung Blossoms

This desire to portray the tung tree as a foreign object conquered, remade, and improved by Americans prevailed in tung publications. Indeed, nationalism had deep connections to tourism, and historian Marguerite Shaffer equates tourism to the "search for national

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[28] "Tung Tree Tract to be Presented as Endowment," *Times-Picayune*, February 13, 1935, p. 9.

[29] C. E. Wright, "Florida's Flora: Green Foliage and Flowering Shrubs Catch Winter Visitor by Surprise," *The New York Times*, Nov. 10, 1963.

[30] Frank A. Montgomery, Jr., "Tung Oil: Gift of the Orient, Box 10, Folder 10, Camille, American Tung Oil Institute, McCain Library and Archives, The University of Southern Mississippi [hereafter ATOI, MLA, USM]; and Frank Thone, "China's Tung Trees Make Good in America," *Springfield Republican* [MA], July 11, 1937, p. 38.

[31] L. T. Pendarvis, "Tung Orchards of Florida, For Sale," *Want and Exchange Bulletin* 9, no. 8 (March 15, 1960), M477, Box 5, Folder 16, Tung History, 1936-1966, ATOI, USM.

[32] L. J. Davenport, "Tung Oil—The Crop That Was," *Alabama Heritage* 53 (Summer 1999), 54.

[33] Marguerite Shaffer, *America First: Tourism and National Identity, 1880-1940* (Washington, D.C.: Smithsonian Institution Press, 2001), 280.

identity."[34] Growers intended that declaring tung American and tracing the history of the development of the domestic tung oil industry would simultaneously draw tourists looking for the exotic and those seeking all things American.[35] All of this created special enthusiasm to the reputation of tung as many tourists were attracted to all things alien, atypical, and even more, natural.[36] Tung growers used this desire for new sights and experiences to beckon tourists to the Tung Belt.

Many cities across the Tung Belt sought to capitalize on tung groves through tourism. Visitors often saw the South as a throwback to the past and believed touring it afforded an epiphany about land, life, and simpler times. Most bought into various stereotypes and associated the South at worst with cotton and slavery and at best with belles and beaches. Aided by the lack of just one southern identity, these beliefs allowed tourists to seek whatever they wanted.[37] The semi-tropical climate of the coast afforded tourists the next best thing to traveling abroad, and they relished destinations ranging from historic sites to scenic vistas.[38] In addition, by the early 1920s, car ownership grew, and new roads multiplied across the South, displacing the domination of tourism by the wealthy and making automobile tourism a middle class icon and $200 million a year industry.[39] Tourism suffered during the Great Depression, but gardens, parks, and arboretums multiplied during the New Deal as did farm tours.[40] After WWII, motor tourism increased significantly as car ownership skyrocketed.[41] Tourists had many options to choose from given the plethora of roadside attractions

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[34] Ibid., 5.

[35] On history as an attractant to tourists, see John A. Jackle, *The Tourist Travel in Twentieth Century North America* (Lincoln: University of Nebraska Press, 1985), 286.

[36] Harvey H. Jackson III, "Developing the Panhandle, Seagrove Beach, Seaside, Watercolor, and the Florida Tourist Tradition," in *Southern Journeys: Tourism, History and Culture in the Modern South*, edited by Richard Starnes (Tuscaloosa: University of Alabama Press, 2003), 66.

[37] Ted Ownby, "Nobody Knows the Troubles I've Seen, but Does Anybody Want to Hear About Them When They're on Vacation?" in *Southern Journeys: Tourism, History and Culture in the Modern South*, edited by Richard Starnes (Tuscaloosa: University of Alabama Press, 2003), 240, 248; and Jackle, 199.

[38] Jackle, 216.

[39] E. J. Williamson, "South Has Great Tourist Business," *Manufacturers' Record* 96, no. 3, July 18, 1929, p. 75; and Brian Black, *Nature and the Environment in Twentieth Century America* (Westport, CT: Greenwood Press, 2006), 7.

[40] Alexander Wilson, T*he Culture of Nature: North American Landscapes from Disney to the Exxon Valdez* (Toronto: Between the Lines, 1991), 41-43.

[41] Ibid., 26.

such as stands, shops, and alligator wrestling to name a few. Even if tung did not appear on a tourist's agenda, growers hoped to gain his or her attention through roadside plantings. After all, citrus trees played a large role in Florida's tourism, and oranges had developed an enormous iconography; it stood to reason that tung could achieve the same recognition.[42]

Just as oranges had ties to the Florida dream, tung growers wanted tourists to think of southern nirvana when they thought of tung. Tung growers deemed tung trees far more beautiful than orange, cherry, peach, and dogwood trees.[43] A Louisiana Forestry Commission Bulletin equated tung groves with "fields of snow."[44] An article in the Jackson Daily News dubbed tung groves a "Million Dollar Bouquet."[45] Down South magazine referred to tung trees as "pink clouds in Dixie."[46] Perhaps this description, more than any other, best fit tung groves for tourism; postcards of blooming tung trees could be purchased throughout the Gulf Coast.[47] Hoping to provide an extra incentive for tourists to visit cities along the coast, growers billed the tung tree as unique to the South.

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[42] Pierre Laszlo, *Citrus: A History* (Chicago: The University of Chicago Press, 2007), 79; Louis Ziegler and Herbert S. Wolfe, *Citrus Growing in Florida* (Gainesville: The University Press of Florida, 1975), ix; and Gary R. Mormino, *Land of Sunshine State of Dreams: A Social History of Modern Florida* (Gainesville: University Press of Florida, 2005), 195.

[43] "The Tung Oil Tree," *Augusta Chronicle*, April 26, 1925, p. 4; Frank Thone, "China's Tung Trees Make Good in America," *Springfield Republican* [MA], July 11, 1937, p. 38; and "North Florida Tung Oil Orchards to Bring More Income to Their Owners," *St. Petersburg Times*, March 18, 1951.

[44] "Tung-oil Tree, China Woodoil Tree," *Louisiana Trees and Shrubs*, p. 155, Louisiana Forestry Commission Bulletin no. 1, Baton Rouge: Claitor's Publishing Division, Tung Oil, Vertical File, Livingston Parish Library [hereafter VF, LPL].

[45] "Tung Orchard—Five Million Dollar Bouquet," *Jackson Daily News*, July 5, 1953.

[46] Evelyn Reid Griffith, "Pink Clouds in Dixie," *Down South* (March-April 1957), 7.

[47] On postcards, see, for example, "A Tung Tree in Full Bloom, Pearl River County, Miss.," and "A Country Road in Tung Blossom Time—Pearl River County, Miss." published in Gulfport, Mississippi, by the Gulfport Printers Company, n.d. These two examples are in the author's possession.

Figure 1. Postcard. Gulfport Printing Company.
Courtesy of John Corley.

Figure 2. Denise Daughtry. Courtesy of Denise Chenel Daughtry.

Many southern cities and regions identified themselves with the tung industry. Poplarville, Mississippi, was "Tung Center of the World." Picayune claimed "tung-oil center of America." St. Tammany Parish was known as "The Pink Parish." Tallahassee, Florida, boasted

as "Tung Headquarters." Fairhope, Alabama, had the Baldwin Plantation, which proclaimed itself to be the "Center of the Tung Belt."[48] In the spring, coastal cities flaunted the pretty, often extensive groves of pink blossoms which flowered from about March 21 to April 11.[49] In April 1941, the first guided tung tours took place in St. Tammany Parish, Louisiana. It was during this tour that the first ever Louisiana Tung Queen, Beatrice "Sally" Core, a future Olympics participant, was crowned.[50] After 1944, Picayune, Mississippi, began holding yearly tours of a seventy-mile path of acreage.[51] Poplarville, too, offered an extensive tung tour, and out-of-town visitors could stay at the local Tung Tree Hotel. Tung plantation tours gained so much attention that the New York Times listed them under "A Tourist's Calendar of Sun-Belt Events."[52] In this and other advertisements, tung tours appeared alongside rose and azalea festivals and attracted thousands of sight-seers during "blossomtime down South."[53]

Tung-themed parades and festivals took place throughout the Tung Belt. In the 1930s, Gainesville, Florida, held its first tung oil parade, partly across the campus of the University of Florida, to honor the first railroad shipment of tung from the city.[54] Tung queens in fairs like the Louisiana Tung Blossom Festival in Covington, Louisiana, or in the case of Florala, Alabama, Blossom Queens appeared at festivals and parades each spring and high school football games each fall thereafter

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[48] Anthony J. Stanonis, *Creating the Big Easy: New Orleans and the Emergence of Modern Tourism*, 1918-1945 (Athens: The University of Georgia Press, 2006), 54, 60; Ann Gilbert, "Covington: Living History & Covington's Founding Families," *Inside Northside Magazine* (Feb/Mar 2002) http://www.insidenorthside.com/feb_mar/art6.htm; Mormino, 188; and "Highlights and Highways of Baldwin: The 1939 Guide to Baldwin County Alabama: America's Newest Playground on Mobile Bay and the Gulf of Mexico," 24, Vertical File, Foley Public Library [hereafter VF, FPL].

[49] "Picayune Plans Tung Area Tour to Open Sunday," *Times Picayune*, March 23, 1940, p. 5.

[50] "First Tung Orchard Tour Attracts Many Visitors Here," *St. Tammany Farmer*, April 18, 1941; and David A. Bice, the Village of Folsom, Louisiana, Tung Oil, VF, LPL.

[51] "Tung Trail is Open for Autoists Today," *Memphis Commercial Appeal,* April 13, 1947.

[52] "A Tourist's Calendar of Sun-Belt Events," *New York Times*, December 10, 1950.

[53] Robert Meyer, Jr., "Dixie Hospitality: Tours of Old Homes and Floral Festivals Await Spring Visitors in the South," *New York Times*, March 8, 1953.

[54] "Tung Oil Parade," Alachua County Library District Heritage Collection," http://heritage.acld.lib.fl.us/1101-1150/1134.html.

across the coast.[55] These events often advertised nationally and received coverage by newspaper and later television reporters.[56] In the words of one journalist on the Picayune Tung Oil Festival, "Nothing like it have I ever seen except in the stage musical "Blossom Time" or the Jeanette MacDonald-Nelson Eddy movie, "Maytime."[57]

Tung blossom events even resulted in a 1943 piano tune titled "Tung Oil Time" by Mrs. James B. Davis of Poplarville and the 1947 song "Tung Oil Time in Mississippi" by Sidney Orr and David Hall.[58] Tung also played an important role at a Mississippi high school.[59]

Figure 3. Tung blossoms. Courtesy of John Corley.

[55] "Ex-Toledoan devoting Florida acres to Growing of Chinese Tung Trees for the Oil of Which Nations are Scrambling," *Plain Dealer*, May 2, 1937, p. 89; and "Florala Beauty Queen of Tung," *Tung World* 1, no. 2 (June 1946), 7.

[56] See, for example mention of the Covington Tung Blossom Festival in *The Billboard,* February 29, 1960, p. 77.

[57] "Dogwood Festival in Bogalusa," *Times-Picayune*, March 17, 1974.

[58] Catalog of Copyright Entries, part 3 Musical Compositions, New Series, Volume 38, Part 1, First Half of 1943, nos. 1-6 (Washington, D.C.: Library of Congress, 1943); and Sidney Orr and David Hall, "Tung Blossom Time in Mississippi" (Hollywood: Nordyke Music Publications, 1947).

[59] Charles Newman, *I Had it All with Pride: A History of Picayune Memorial High School "Pride of the Tung Belt" Band, 1954-1971* (Clinton, MS: One House Publishing Company, 1992), 6, 8.

In 1954, new band director Charles S. Newman named the Picayune Memorial High School band the "Pride of the Tung Belt" in an attempt to trigger enthusiasm from students and the community at large.[60] The uniforms, consisting of maroon coats and maroon striped white pants, had a logo consisting of a tung blossom encircled with the words "Pride of the Tung Belt" on the left arm.[61] According to Newman's son, this association with the tung industry worked magic, and the band became a pseudo ambassador for the Tung South. The band won second place in a national championship at the Jaycee Parade of States in 1955. While performing at the Rex Mardi Gras Parade in New Orleans that same year, it was filmed by a Hollywood camera crew, and the resultant stock footage found its way into several movies, including one starring Elvis Presley. Thanks to the financial support of L. O. Crosby, Jr., the band participated in the 1956 Rose Parade where Newman had the pleasure of meeting Hopalong Cassidy and explaining the Tung Belt to his childhood hero.[62] While in California, Walt Disney invited the band to give the first concert at newly opened Disneyland. The band attracted so much attention that thanks to solicited auditions by NBC, CBS, and ABC, the Pride of the Tung Belt appeared not once, but seven times on nationwide television. In quick succession the band performed at the Orange Bowl, Cotton Bowl, Gator Bowl, Sugar Bowl, and in 1959, gave a concert in the newly created U.S. Senate Office Building and later marched in the Macy's Thanksgiving Day Parade.[63] Although a band with tung blossoms on its uniforms appeared strange to onlookers, many coastal residents looked on with delight. With this in mind, they tried to make tung trees so accessible that people not attending marches or festivals could enjoy the sight of the blooms from the comfort of their vehicles.

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[60] Charles Nutter, "Tung Nut Industry Fading from State," *Clarion-Ledger*, December 10, 1972. See also, Noel Polk, *Outside the Southern Myth* (Jackson: University Press of Mississippi, 1997), 111.

[61] Newman, 6, 8.

[62] Ibid., 37, 58. See also, Charles Newman, interviewed by author, August 8, 2012, tape recording.

[63] *And the Band Played On: The Life and Imprint of Charlie Newman*, produced and directed by William Newman, 31:21 min., documentary, http://www.prideofthetungbelt.com/videos/ (accessed August 8, 2012).

Figure 4. Tung nut still encased in a rind. Author's collection.

The State Highway Department, according to the *Jackson Daily News*, described the tung tree as "an ornamental because of its scenic beauty."[64] *The Clarion Ledger* said tung orchards provided a "roadside panorama of beauty that fascinates Northern visitors."[65] Tourists driving along Louisiana Highway 21 as well as U.S. 19 and U.S. 27 near Tallahassee, Florida, and Capps, Florida, gazed at a "veritable blanket of salmon pink petals."[66] The Tung Trail, miles of trees along the road, stretched from Picayune to McNeill, Mississippi, along Highway 11, and another stretched from Picayune to Bogalusa, Louisiana.[67] Travelers to the coast multiplied in the post WWII years as middle class tourism expanded, but the Federal Highway Act of 1956 damaged roadside tourism.[68] After interstate highways developed,

[64] Phil Stroupe, "Tung Oil Production Brings Five Million Dollar Income to Farmers," *Jackson Daily News*, July 5, 1953.

[65] Mississippi Has 60% of Nation's Tung Oil Business, *Clarion Ledger*, March 26, 1961.

[66] Bob Landry, "Once Great Tung Industry No More," *Clarion Ledger*, August 23, 1974, 2B.

[67] "Picayune Plans Tung Area Tour to Open Sunday," *Times-Picayune*, March 23, 1940, p. 5.

[68] Dr. Larry Burnette, *Historic Baldwin County: A Bicentennial History* (San Antonio, TX: Historical Publishing Network, 2007), 34-36; Stanonis, 22; and Jackle, 304.

drivers needed sufficient incentive to leave the thoroughfare to see an attraction, and in most cases, small ones like tung orchards suffered.[69] Given that little could be seen on the expressways, the Tung Belt had to depend even more on word of mouth and print to fuel its tourism.[70] Tung-related businesses also helped to bolster the tree's reputation.

Tung Attracts Businesses

Given the growth of tung acreage and tung industries, some growers saw tung as a match to cotton in the South. The Dixie Tung Oil Development company in Forrest County, Mississippi, predicted the usurpation of King Cotton by King Tung.[71] Polk City, Florida, founder Isaac van Horn "thought he'd found Polk City's economic salvation" in tung.[72] While the seat of tung cultivation moved from Florida to Mississippi and Louisiana in the 1940s, faith in tung was bolstered by Capps, Florida. Capps had suffered economically, even with its turpentine production, until the St. Joe Paper Company began tung operations. By 1950, Florida had six tung oil mills, Louisiana had five, Mississippi and Alabama had four each, and Georgia had one. These mills employed hundreds and greatly aided county economies.[73] In fact, Pearl River County credited tung for its move from the bottom to one of the top ten counties in the state of Mississippi.[74] The bulk of the credit for the county's economic growth lay with cattle, but tung production certainly helped.[75] Its most successful company was the Crosby Tung Oil Processing Plant and Paint Factory in Picayune, which produced "World Famous" tung paints.[76] Northern and western companies dealing with tung were motivated to relocate to the South or form southern branches.

Tung-related industries like nurseries and companies dealing

[69] Tim Hollis, *Before Disney: 100 Years of Roadside Fun* (Jackson: University Press of Mississippi, 1999), 15.

[70] Mormino, 244.

[71] "Way Down South at Dixie," *The Southern Conservationist and American Tung Oil* 6, no. 1 (Apr. 1939), 17.

[72] Cinnamon Blair, "Tung Oil's Fortunes Failed in Florida," *Lakeland Ledger*, February 26, 2006.

[73] Mormino, 188.

[74] "Advertised Building Character IN much-Troubled Mississippi," *Augusta Chronicle*, October 23, 1955, Section C, p. 3.

[75] Livestock Ideal Tung Auxiliary," *Tung World* 6, no. 1 (May 1961), 10.

[76] Newman, 58.

with bags, fertilizer, harvesting, milling, investment, oil inspection, insurance, marketing, paints, and varnishes flocked to the South not only to be closer to tung acreage but because the region afforded less union activity, provided cheap labor, and offered generous tax incentives. After WWII, many plants moved south to capitalize on perks, but over time, their very presence helped narrow the gap between regions when it came to management, wages, and work conditions.[77] By the mid-1960s, Alabama, Mississippi, and Louisiana tantalized manufacturers with the promise of no state or local taxes for an entire decade.[78] Tung businesses offering land purchase guidance, cultivation instruction, storage, refining, and marketing dotted the South and the country at large. A few of the non-coastal tung companies included Mississippi Tung Groves, Inc., in Wilmington, Delaware; The National Tung Grove Corporation in Rock Island, Illinois; Southern Tung Oil Company in Pittsburgh, Pennsylvania; and U.S. Tung Oil Company, Inc., in New York City, New York.[79] While tung manufacturers, tourism, festivals, and publications fanned the reputation of tung, the tree continued to suffer from a lack of mass recognition for one reason—poison.

Tung and the Poison Problem

Tung trees presented a lovely image to the eye, but the toxicity of their nuts barred a significant market sector. In the words of *Down South* magazine, "About the only thing the tung isn't good for is eating."[80] *The Tallahassee Democrat* later commented, "Many a

[77] Bruce J. Schulman, *From Cotton Belt to Sunbelt: Federal Policy, Economic Development, and the Transformation of the South, 1938-1980* (New York: Oxford University Press, 1991), 108; and James C. Cobb, *The Selling of the South: The Southern Crusade for Industrial Development, 1936-1980* (Baton Rouge: Louisiana State University, 1982), 47, 50, 64.

[78] Cobb, *The Selling of the South*, 5, 25-27, 36, 48, 157.

[79] See "Dixie Tung Empire Corp., https://business.sos.state.ms.us/corp/soskb/Filings.asp?106648; "Mississippi Tung Groves, Inc.," https://business.sos.state.ms.us/corp/soskb/Corp.asp?112420; "National Tung Grove Corp.," https://business.sos.state.ms.us/corp/soskb/Corp.asp?104338; "Southern Tung Oil Co.," https://business.sos.state.ms.us/corp/soskb/Corp.asp?78329; and "U.S. Tung Oil Co., Inc.," http://appext9.dos.state.ny.us/corp_public/CORPSEARCH.ENTITY_INFORMATION?p_nameid=38756&p_corpid=32007&p_entity_name=%74%75%6E%67%20%6F%69%6C&p_name_type=%41&p_search_type=%43%4F%4E%54%41%49%4E%53&p_srch_results_page=0.

[80] Bobby Smith, "Tung Oil: The South Makes Oil from the Trees of China," *Down South* (Feb.-March 1951), 24.

Northern visitor has learned this the hard way."[81] Consuming tung nuts caused illness and swelling of the mouth and lips and possibly hypertension, delirium, convulsions, anaphylactic shock, and death.[82] Despite this, many individuals either disbelieved or dismissed the risk given the visual appeal of the large nut which strongly resembled a Brazil nut or a walnut. While the nut smelled strongly of kerosene or as one source claimed, ham fat, its appearance won out.[83] In one *Louisiana Forestry Bulletin*, an author noted that the very name "tung nut" beckoned onlookers to eat and that "there are still skeptical individuals who believe the warning not to consume is a trick to deprive them of something edible."[84]

Figure 5. Tung nut pickers, February 28, 1940. Dixie Press Collection, Mississippi Gulf Coast Community College Archives. Courtesy of Mississippi Gulf Coast Community College Archives.

[81] Sam Miller, "Bulldozers End the Tung Dynasty at Capps," *Tallahassee Democrat*, September 6, 1976, p. 17.

[82] Edward Balthrop, "Tung Nut Poisoning," *Southern Medical Journal* 45, no. 9 (Sept. 1952); Edward Balthrop, William B. Gallagher, Thomas F. McDonald, and Sam Camariotes, "Tung Nut Poisoning," *The Journal of Florida Medical Association* 40 (May 1954): 813-820; and K. R. Langdon, "Tung oil Tree, aleurites fordii," *Nematology (botany) Circular* no. 45 (Nov. 1978).

[83] *One Thousand More Paint Questions Answered* (New York: The Painters Magazine, 1908), 170.

[84] Clair A. Brown, *Louisiana Trees and Shrubs*, p. 155, Louisiana Forestry Commission Bulletin, No. 1 Baton Rouge: Claitor's Publishing Division, Tung Oil, VF, LCP.

Along the Tung Belt, many knew the poisonous truth behind the beautiful tung tree. Locals deemed it common knowledge and joked about the nuts. According to Roy M. Moffitt of Roy M. Moffitt & Company, "Don't feed tung nuts to your visitors unless, of course, ..."[85] Most victims either mistook tung for walnuts or simply thought the pear-shaped nut looked tasty. Countless cases of tung poisoning occurred from the early days of plantings onward, but several examples highlight the inherent dangers. In one case, a college student consumed five nuts, began to feel sick, wobbly, and incredibly thirsty but drinking only increased the pain. Consistent with food poisoning, his vomit appeared white and his stool yellow and runny. The following morning, the young man felt no stomach discomfort but had a headache similar to that of a hangover.[86] Another case took place when five small children in Mobile, Alabama, mistook tung nuts for Brazil nuts and became nauseated, vomited, and developed diarrhea, severe headaches, dilated pupils, high blood pressure, and risky levels of dehydration. Low oxygen levels resulted in cyanosis that caused their skin to turn blue around the lips and ears. At the Emergency Room at the Mobile City Hospital, they received enemas and saturated sodium chloride to incite vomiting and fortunately recovered.[87] Other victims recovered with the help of magnesium sulfate and "fluid and electrolyte replacement therapy," but the negative reputation of tung nuts persisted, further fueling the quest to detoxify tung in the hopes of making tung more marketable.[88]

Placing the tung nut on every kitchen table in the country, and consequently, raising its value, remained high on the list on the goals of growers and scientists over the decades. Rich in protein, tung, if ridden of toxins, stood to make a good source of nourishment for livestock and people. After all, tung oil and tung meal consisted of twenty-two

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[85] Roy M. Moffitt & Company to Dear Association, July 16, 1945, Box 1, American Tung Oil Association 1945 [2/4], Dantzler Company, Special Collections, Mitchell Memorial Library, Mississippi State University [hereafter SC, MML, MSU].

[86] J. Edward Balthrop, "Tung Nut Poisoning: A Report of Ten Cases," *City Hospital Bulletin* 21, no. 2 (Oct. 1952), 4, Box 10, Folder 10, Camille, ATOI, MLA, USM.

[87] Ibid., 6.

[88] Edward Balthrop, "Tung Nut Poisoning," Box 11, Folder 1, Tung Nut Poisoning (1952-1962), ATOI, MLA, USM. See also, Edward Balthrop, "Tung Nut Poisoning," *Southern Medical Journal* 45, no. 9 (Sept. 1952).

percent and twenty-seven percent protein, respectively.[89] In the 1940s, USDA scientists found that tung nuts had at least two unknown, unstable toxic components. They called the poisons, containing varying amounts of carbon, hydrogen, and oxygen, Toxin I and Toxin II. The first toxin was extracted from the nuts with solvents—ether or ethanol and benzene. When thus exposed, the toxin, soon to be identified as sapolin, separated and could be easily divided from tung meal. The second toxin, later found to be the alcohol soluble toxalbumin, they either detoxified with ethyl acetate or by warming tung to 230 degrees Celsius for two hours and then adding petroleum naphtha.[90] Having identified the toxins, scientists tested them on live subjects.

Scientists studied various hypotheses by feeding the tung meal to rats, rabbits, chicks, dogs, and pigs. Hoping to find what percentages of mixtures lessened the toxins in both the oil and kernels, they recorded the reactions. Rats tested tended to weaken and die when fed tung meal while rabbits only developed diarrhea. Dogs experienced diarrhea and vomiting while pigs refused to eat tung meal. A small catastrophe took place in initial tests on chicks because forty milligrams of tung meal led to death. Not until the dosage was lowered to ten milligrams did tung meal become less dangerous to consume. Experimenting on larger animals like cattle revealed not simply diarrhea but damage to the liver, kidneys, stomach, and intestines. In 1946, scientists finally succeeded in separating sapolin, making tung meal less dangerous to eat. They continued their quest knowing victory could alter the status of tung oil in consumer markets. After all, non-edible tung meal sold for $7-10 a ton in 1954 but if made edible, stood to sell for $35 a ton. Unfortunately, results remained unpredictable and deaths continued, but scientists kept trying to detoxify tung with phosphoric acid, sodium

[89] R. L. Holmes and E. T. Rayner, "Isolation of Two Nitrogen-Free Toxins from Tung Kernels," *The Journal of The American Tung Oil Chemists' Society* 35, no. 11 (Nov. 1958): 586. On detoxification, see, for example, G. E. Mann, W. H. Hoffman, Jr., and A. M. Ambrose, "Oilseed Processing: Detoxification and Toxicological Studies of Tung Meal," *Journal of Agricultural Food Chemistry* 2 (1953): 258-263; and E. Balthrop, W. B. Gallagher, T. F. McDonald, and S. Camariotes, "Two Outbreaks of Acute Tung Nut (Aleurites fordii) Poisoning," *Journal of Florida Medical Association* 40 (1954): 813-820.

[90] G. E. Mann, W. H. Hoffman, Jr., and A. M. Ambrose, "Oilseed Processing: Detoxification and Toxicological Studies of Tung Meal," *Journal of Agricultural Food Chemistry* 2 (1953): 258-263; Holmes and E. T. Rayner, "Isolation of Two Nitrogen-Free Toxins from Tung Kernels," 587; and Reavis C. Sproull, "Chemurgic Research in S.R.I. Laboratories," *Chemurgic Digest* 8, no. 6 (June 1949), 16.

carbonate, urea, and benzene extraction. Detoxification efforts by scientists at The University of Mississippi even attracted mention in *The U.S. News and World Report* years later in 1966.[91] Despite some progress using heat to lower the toxicity, tung meal never did become consistently safe enough for animals, let alone people, to eat. Studies to make tung nuts edible may never have borne fruit, but scientists took solace in pharmaceutical advances with tung oil.

Tung Ties to Medicine

The connections between tung oil and medicines dated back millennia given that the Chinese used it as a salve and ointment and even believed small doses had the power to cure metallic poisoning and even insanity. In the U.S., the first medicinal tie may have been tung-based catheters during WWII. By 1951, tung oil had become a key ingredient in a handful of medicines.[92] Tests in Germany in 1903 had only created skin dermatitis when applied as a salve. In the U.S. tung, while hardly a household name, had a negative reputation. Even *Webster's Dictionary* defined tung as a "poisonous pungent substance."[93] Eager to overcome such notorious labeling, scientists sought to make tung a trusted and desired medical necessity. The faith some had in

[91] "Combinations of detoxified tung nut meal and soybean oilmeal as sources of supplementary protein for swine," http://ufdc.ufl.edu//UF00072846/00001; G. K. David, N.R. Mehrhof, and R. S. McKinney, "Tung Meal in Rations for Growing Chicks," *Poultry Science* 25 (1945), 74-9; "De-Poisoning Tung," *Tung World* 1, no. 2 (June 1946); "Begin Project to Detoxify Tung Meal," *American Tung News* 17, no. 1 (Jan 1966), 6; "Tung Oil Studies at The University of Mississippi," *American Tung News* 18, no. 4 (April 1967), 8; "Methods Found to Detoxify Tung Meal," *American Tung News* 18, no. 6 (June 1967), 4; "Ad on Tung Meal Study Placed in U.S. News by Utilities System," *American Tung News* 17, no. 5 (May 1966), 11; "Tung Research Committee Hears Reports by Scientists," August 28, 1962, Agricultural Research Service, Southern Utilization Research and Development Division," Box 20, Folder 3, Tung Oil, Farm Chemurgic Council, University Archives and Historic Collections, Michigan State University [hereafter FCC, UAHC, MSU]; "Problem: Upgrade Oilseed Meals," *Chemurgic Digest* 15, no. 8 (Sept. 1956), 6; and B. M. Kopacz, "Tung Oil Research and Development at the Southern Regional Laboratory," *The Journal of American Oil Chemists' Society* 45, no. 4 (April 1968), 288.

[92] "Investigations of the Tung Oil Industry," *Congressional Record-Senate*, 1949, p. 8333, Tung Oil, Subject File, Mississippi Department of Archives and History [hereafter SF, MDAH]; and Holmes, 587; L. A. Goldblatt, "The Tung Industry. II. Processing and Utilization," *Economic Botany* 13, no. 4 (1959): 348; and M. Murph Snelling, "The Multiple Uses of Processed Tung Oil in Industrial Surgery," The Mississippi Doctor (May 1953): 397-402.

[93] "TGCA Sponsors Research Work; Renames Entire Slate of Officers," *Tung World* 6, no. 9 (Feb. 1952), 4.

the medicinal potential of tung may have stemmed from its being a relative to castor, a bitter tasting medicine known primarily as a cure for constipation. Some supposed tung oil to have had a nice flavor. For example, during the Taiping Rebellion, some soldiers mistook a vat of tung oil for pork fat, but others imagined that it tasted much the same as castor.[94] One source insisted that heated oil tasted bad but cold oil did not.[95] Whatever the case, unfortunate tourists who had innocently nibbled on attractive red colored, apple-sized tung nuts did indeed find themselves purged. They often became hospitalized because of extreme vomiting and defecation to the point of dangerous dehydration, delirium, and even convulsions.[96] Nevertheless, advocates of pharmaceutical tung emphasized that the poison lay in the kernel of the nut, not the oil, and billed their products as painless solutions for any number of ailments.

Tung World editors and former journalists John and Edith Watts perceived the toxicity of tung as a challenge, not a barrier. They found that the toxins were in the nuts, not the oil. Experimenting on pets and themselves, they soon claimed that tung oil could help body odor and ward off mosquitoes while curing ailments ranging from acne and rashes to skin cancer. Amazed by the results, the two wondered why tung had never been used in medicines. In reality, the Chinese and Hawaiians had used tung oil for acne, eczema, psoriasis, and sunburns, and even as baby oil for centuries, but the Watts wanted to establish such usage domestically.[97] They imagined that the reason tung oil medicine had been absent on the mainland lay in its poisonous reputation. The only problem they encountered seemed to be that tung hardened when exposed to light and when heated by sunlight. John found a way to stabilize or at least create predictable behavior of his tung oil ointment but would not reveal the secret. In 1951, the Watts began selling stock in their company, incorporated as Tungolin Company, Inc., located in Gulfport, Mississippi, with branch offices in Mobile, Alabama, and DeFuniak Springs, Florida. They soon sold

[94] Samuel Pollard, *In Unknown China: A Record of Observations, Adventures . . .* (Philadelphia: J. B. Lippincott Company, 1921), 235.

[95] Edward Richard Bolton and Cecil Revis, *Fatty Foods, Their Practical Examination* (Philadelphia: P. Blakiston's Son & Co., 1913), 250.

[96] Balthrop, "Tung Nut Poisoning: A Report of Ten Cases," 4.

[97] On Hawaiian usage, see, for example, Anthony Dweck, *Formulating Natural Cosmetics* (Allured Pub. Corp., 2010), 2.

almost 30,000 bottles of Tungolin from Florida to Arkansas.[98] Sales proved so successful that in 1953, they gave up editing Tung World so they could focus completely on Tungolin.[99] The Watts also claimed that tung oil proved a faster and more effective solution for constipation than castor oil if taken orally. While not advertised as cure-alls, the descriptions of Tungolin came close.

The Watts heralded Tungolin Doctor Oil and Tungolex First Aid Oil as a solution to constipation if taken orally but primarily as a healing salve for blisters, scalds, rashes, chapped hands, cold sores, cuts, insect bites, hemorrhoids, athlete's foot, mouth sores, and bleeding gums. They also sold Tungolin Topicream to diminish acne and blackheads. While it might be tempting to dismiss these as "snake oil" efforts, medicinal tung oil was no joke. Patents for these products had been filed and granted. Even physicians like Dr. M. M. Snelling of Gulfport, Mississippi, used tung to treat cuts, contusions, ulcers, and burns on 682 patients while the Tulane School of Medicine, Emory University, University of Tennessee, University of Mississippi, and University of Texas had scientists seeking ways in which to apply tung oil in medicines. According to a study in 1945 by Dr. Arthur Grollman of the University of Texas, tung oil had the ability to lessen hypertension. Further credibility came when the National Heart Institute gave a $3,910 grant to the University of Mississippi to study tung oil as a combatant for heart disease. Later studies centered on tung oil as a cancer preventative due to its eleostearic acid related anti-tumor

[98] Elliot Hebert, "Is Tung Oil A Healer, Too?" *Times Picayune*, October 11, 1953; "Tung Oil Medicant?" *Times Picayune*, October 16, 1953; John Watts to Louis Chenel, December 20, 1951, Folder: Tung Oil Production: Louis Chenel, 1944-1967, Louie E. Chenel Family Papers, Special Collections, Hill Memorial Library, Louisiana State University [hereafter LECFP, SC, HML, LSU]; and "Tung Oil Industry Has Own Magazine," *Jackson Daily News*, April 24, 1946.

[99] See, "40 New Uses for Tung Oil? It's Possible. And Soon!" *Tung World* 7, no. 4 (Sept. 1952), 8; and "Congratulations Are in Order," *Tung World* 8, no. 1 (Jan. 1953), 4.

qualities.[100] Dr. M. M. Snelling, a fellow of the American College of Surgeons, experimented with tung oil as a cure for skin cancer and eventually came to argue, "Healthy tissues grow 50 percent faster than with any other treatment."[101] Evidently, the poisonous tung nut held a benign pharmaceutical wonder in the form of oil, but distribution of these medicines remained in the South and did not spread nationwide.

Decline of the Tung Industry

By the late 1960s, tung oil had yet to achieve mass recognition. According to The Bogalusa Sunday News, mention of tung evoked "blank stares or sniggers from the average citizen who has never lived in the Gulf Coast area."[102] Even many coastal residents knew little enough about the tree to frequently misspell it as "tongue."[103] While tours of the country had grown in popularity in the early 1960s, the role of tung in tourism had also declined due to the construction of interstate highways and roadside beautification movements that decreased the

[100] Preston W. Darling, "Tung Enters Medical Field," *Tung World* 7, no. 4 (Sept. 1952), 4; "National Heart Institute Grant Made for Research Using Tung Oil for Heart Ailments," *Tung World* 12, no. 10 (Oct. 1955), 7; "Medicinal Tung Oil," *Tung World* 13, no. 8 (Aug. 1956), 7; Walter Goodstein, "Tung Oil as Heart Disease Treatment to be Studied," *Times-Picayune* October 30, 1955, 2; Richard P. Creagan to James H. Anderson, January 17, 1975, James H. Anderson, Box 1, Folder 1 (25), 1975, Acc. No. A81-8, South Miss. Branch Experiment Station, Congressional and Political Research Center, Mitchell Memorial Library, Mississippi State University [hereafter SMBES, CPRC, MML, MSU]; Snelling, 397-402; Phil Stroupe, "Tung Oil Production Brings Five Million Dollar Income to Farmers," *Jackson Daily News*, July 5, 1953; Elliott Hebert, "Is Tung Oil A Healer, Too? *The Times Picayune*, October 11, 1953; and "Lamont Rowlands," *Tung World* 7, no. 10 (March 1953), 8. Of interest, folk remedies included tung as a cure for masturbation. See, James A. Duke, *Handbook of Nuts* (Baton Rouge: CRC Press LLC, 1989), 8.

[101] "Mississippi Now Leading in The Tung Oil Industry," *Jackson Daily News*, June 8, 1954. It should be noted that later research combated many of these claims. Many scientists came to claim that tung could actually cause rather than cure cancer. For example, it has been argued that breathing remnants of dried leaves causes Epstein-Barr Virus (EBV) which can lead to lymphoma and nasopharyngeal carcinoma. See, for example, Hirota Fujiki, Erich Hecker, Richard E. Moore, Takashi Sugimura, and I. Bernard Weinstein, ed., *Cellular Interactions by Environmental Tumor Promoters, Proceedings of the 14th International Symposium of The Princess Takamatsu Cancer Research Fund, Tokyo, 1983* (Tokyo: Japan Scientific Societies Press, 1984), 131; and A. W. Norhanom and M. Yadav, "Tumour Promoter Activity in Malaysian Euphorbiaceae," *British Journal of Cancer* 71 (1995): 776-779.

[102] "Bogalusa Center of Tung Orchard Research Work," *Bogalusa Sunday News*, March 20, 1966.

[103] "Tung Trees are Not 'Tongue' Trees," *Times-Picayune*, March 22, 1971.

number of billboard advertisements.[104] Roadside attractions had long since been replaced with hotels, casinos, and gardens (e.g., Busch Gardens, Cypress Gardens, and Bok Sanctuary).[105] Theme parks such as Six Flags (1961) had become all the rage.[106] Ironically, tourists traveled hundreds if not thousands of miles to see man-made creations rather than nature's wonders.[107] With fewer motorists seeking to glimpse tung orchards, tung no longer played a significant role in coastal tourism. The industry's death knell, however, derived not from this obsolescence, but from a hurricane.

Hurricane Camille, a Category 5 Storm with its 190 miles per hour wind, seven to ten inches of rain, and twenty-foot high waves, wrought havoc on the Tung Belt on August 17-18, 1969. Approximately a month before harvest, the winds impacted 35,000-40,000 acres of orchards in coastal Louisiana and Mississippi, as well as 10,000 acres in Mobile and Baldwin County, Alabama. Orchards lay in ruins with trees uprooted or split; $1.42 billion in damages created devastation to personal and business properties, and 258 coastal residents lost their lives.[108] According to a September edition of the *New York Times*, "The entire waterfront from Biloxi west to the outskirts of New Orleans, a distance of 70 miles, still looks as if it had been bombed."[109] Pearl River County, the seat of the tung industry, lost 100% of its acreage and other areas fared little better. Growers could have replanted but given foreign competition, cheaper synthetics, and decades of frustration,

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[104] Hollis, 15.

[105] *Polk County: The Heart of Florida* (Fort Lauderdale: Copperfield Publications, Inc., 2004), 45, 92; and Louise K. Frisbie, *Yesterday's Polk County* (Miami: E. A. Seeman Publishing, Inc., 1976), 105, 108; Wilson, 45; and Mormino, 110, 249.

[106] Mormino, 112, 119; and Wilson, 22-24.

[107] Mormino, 119, 95.

[108] Roy Reed, "On Gulf Coast, Storm's Scars are Still Vivid," *New York Times*, September 12, 1969. See also, "General Information Pertaining to The Agricultural Economy of Pearl River County," Box 10, Folder 10, Camille; and "ATOA and Mississippi Pecan Growers Association to Richard Sullivan, Box 10, Folder 10, Camille, ATOI, MLA, USM; Dan Ellis, *All About Camille* (Pass Christian: Dan Ellis, 2000), 3; "Hurricane Camille, 1969," *TIME Magazine*, May 11, 2011, 202; "Tides Begin to Rise," Aug. 17, 1969, *The Daily Herald, The Story of Hurricane Camille* (Gulfport: Gulf Publishing, 1969); Stefan Bechtel, *Roar of the Heavens* (New York: Citadel Press, 2006), 250; and Ernest Zebrowski and Judith A. Howard, *Category 5: The Story of Camille: Lessons Unlearned from America's Most Violent Hurricane* (Ann Arbor: University of Michigan Press, 2005).

[109] Roy Reed, "On Gulf Coast, Storm's Scars are Still Vivid," *New York Times*, September 12, 1969.

many had become disgusted with the tung industry and deemed the hurricane the last straw. Others believed Camille had done them a favor by finally forcing them to choose a more profitable, dependable agricultural venture. When the USDA ceased price supports, the handful of remaining tung growers turned their attentions elsewhere.[110]

By the late 1970s, the days of tung queens had long since ended. Tung tours had ceased, and the Picayune Memorial High School Band had replaced their tung blossom logo with Saturn Rockets.[111] Newspaper coverage, what little took place, no longer spoke of tung in glorifying terms. Instead, the tone frequently proved either detached or nostalgic. In 1977, an article in the *Times-Picayune* simply described tung as "over."[112] The following year, the *Times-Picayune* ran an article commenting that Picayune had finally taken down its sign "Tung Oil Capital of the World." One of its journalists said somewhat regretfully that the tung industry had "simply faded away" and been replaced by other, more productive Sunbelt industries like chemicals, steel, paints, forest products, fertilizers, farm machinery, tourism, and space and military defense facilities across the Gulf Coast.[113] Agribusiness had dominated agriculture with the number and size of farms in the country changing from 5.7 million farms of about 178 acres each in 1900 to 2.5 million farms of 415 acres each in 1978.[114] The domestic tung oil industry, due to a combination of freezes, hurricanes, parity payments, foreign competition, acrylic paints, and cheaper oilseeds, had ended, but tung oil and tung trees remained a part of life.

Reminders of the tung oil industry continued in the minds of former growers and their children. Many like Louis Chenel had nothing but

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[110] County Supervisor, FHA, Poplarville, Mississippi, to State Director, FHA, Jackson, Mississippi, August 27, 1969, Box 10, Folder 10, Camille, ATOI, MLA, USM; *Mississippi Agricultural Stabilization and Conservation Service Newsletter* no. 73 (Aug. 27, 1969); Pierre Livaudais, interviewed by author, July 10, 2012, tape recording; Denise Chenel Daughtry, interviewed by author, October 11, 2012, tape recording; and L.O. Crosby, Jr., interviewedby Dr. Orley B. Caudill, November 5, 1974, transcript, the Mississippi Oral History Program of The University of Southern Mississippi, vol. 155 (1980), The Center for Oral History and Cultural Heritage, McCain Library and Archives, The University of Southern Mississippi.

[111] Newman, 211.

[112] "Something Old and Something New in Covington," *Times-Picayune*, July 24, 1977.

[113] Stella Pitts, Picayune, Miss., Once Capital of Thriving Tung Oil Industry," *Times Picayune,* February 26, 1978.

[114] Donald Worster, *The Wealth of Nature: Environmental History and the Ecological Imagination* (NY: Oxford University Press, 1993), 89-90.

poor opinions of tung trees after the industry ceased. According to his daughter Denise Daughtry, "So the end of the story is my father whining and complaining about how the tung industry was horrible and terrible" and that "he wasted twenty years of his life on this."[115] For her part, Daughtry said, "I planted one in New Orleans and I thought it was a beautiful tree . . . because it reminded me of the good old days even though my father . . . went, 'Aghh, be gone Satan'" every time he saw it.[116] Money Hill owners David and Sally Goodyear mulled over making a comeback but decided otherwise. According to Mrs. Goodyear, "We had a consultant come down and we asked what should we grow and he said houses."[117] They took his advice and turned their focus to housing development but never forgot the "happy memories" of their tung past.[118] Similarly, the L. O. Crosby, Jr., family maintained good memories of tung trees or as a son-in-law called them, 'pink centered dogwoods.'[119] Mementos of the industry could also be seen in newspapers, magazines, and manufacturing.

As early as 1974, the *Mobile Register* answered a reader's request to identify a leaf from a tree he did not recognize, and the newspaper columnist identified it as tung.[120] In 1980, the same paper published a poem called "Tremendous Gifts of God" that mentioned tung.[121] In 1985, a *Kiplinger's Magazine* article mentioned tung trees.[122] Paint and varnish, linoleum, and ink manufacturers among others kept purchasing tung oil, albeit to a lesser extent, from China, Argentina, Paraguay, Brazil, Africa, and India.[123] Many coastal companies like Var Tung Coatings, Inc., in Picayune, and Tung Oil, LLC in Ocala, Florida, and Hammond Tung Oil Partnership, in Hammond, Louisiana,

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[115] Daughtry interview.

[116] Ibid.

[117] Goodyear interview. See also, "Goodyear Clan Has High Hopes for Money Hill," *Times-Picayune*, Aug. 13, 1988, p. 82.

[118] Goodyear interview.

[119] Gammill interview.

[120] "Grow A Bloomin' Thing by Bob Green," *Mobile Register*, September 26, 1974, p. 56.

[121] Bettye H. Brown, "Tremendous Gifts of God!" *Mobile Register*, June 8, 1980, p. 118.

[122] "At Home: The Natural Beauty of Tung Oil," *The Kiplinger Magazine: Changing Times* 39, no. 1 (Jan. 1985), 12.

[123] On India, see, Rashtra Vardhana, *Floristic Plants of the World* vol. 1 (New Delhi: Sarup & Sons, 2006), 46. On Brazil, see, for example, Ellen Bromfield Geld, *View from Fazenda: Tale of Brazilian Heartlands* (Ohio University Press, 2003), 8.

however, depended heavily on tung oil.[124] Even non-southern businesses like Formby's Company in Upper Saddle River, New Jersey, maintained significant interest but due to high costs, often mixed tung oil with alkyds, phenolic resins, or other oilseeds.[125] The ink industry had become an even more important consumer market for tung.[126] Since the banning of DDT (dichloro-diphenyl-trichloroethane) in 1972, U.S. pesticide companies continued to seek effective replacements less harmful to the environment, and tung oil incited some interests.[127] While many such businesses deemed the eleostearic acid in tung oil too unpredictable and inflammable to be the base of a pesticide, Bio-System Research, Inc., in Colorado wanted to market tung oil as a boll weevil deterrent because one spray could keep bugs away for several weeks to a month.[128] Even though competition from alkyds, cellulose, phenol-formaldehyde resins, and other oilseeds abounded, tung uses multiplied, and revival efforts ensued.

Attempts to Revive the Tung Industry

In the early 1990s two men tried to reestablish the domestic tung oil industry. New York tung importer Blake Hanson, owner of Industrial Oil Products in Woodbury, New York, and John Corley, saw several reasons for bringing back tung cultivation. Chinese and Argentine import levels had dropped because the price, while still twice as much or more above that of other oilseeds, had dropped to

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[124] On Var Tung Coatings, Inc., see, https://business.sos.state.ms.us/corp/soskb/Corp.asp?127686; and (https://business.sos.state.ms.us/corp/soskb/Corp.asp?20682). On Tung Oil, LLC, see (http://www.sunbiz.org/scripts/cordet.exe?action=DETFIL&inq_doc_number=L05000117989&inq_came_from=NAMFWD&cor_web_names_seq_number=0000&names_name_ind=N&names_cor_number=&names_name_seq=&names_name_ind=&names_comp_name='TUNGOIL&names_filing_type=. On Hammond Tung Oil Partnership, LTD, see http://www.secstates.com/LA_Louisiana_Secretary_of_State_Corporation_Search/).

[125] A. J. Hand, "An Expert's Guide," *Popular Science* 227, no. 2 (Aug. 1985), 94.

[126] James A. Duke and Judith L. duCellier, *CRC Handbook of Alternative Cash Crops* (CRC Press, 1993), 264.

[127] On DDT, see, for example, Rachel Carson, *Silent Spring* (New York: Houghton Mifflin Company, 2002), 20-30.

[128] Earl Aronson, "The Weeders Guide," *Mobile Register*, April 10, 1983, 30; and M. Jacobson and M. M. Crystal, "Effectiveness of Several Polyunsaturated Seed Oils as Boll Weevil Feeding Deterrents," *The Journal of American Oil Chemists' Society* 58, no. 11 (Nov 1981), 982. Tung oil was also seen as a potential pesticide for termites. See, http://www.msacad.org/journal/julyjournal/rachel.html.

sixty cents a pound. They hoped that U.S. production could help to stabilize the fluctuating price of tung. Chinese and Latin American tung production was hampered by farm labor issues and fertilizer costs. Most South American trees had aged to almost forty, the end of a lifespan for a tung tree, and only one of Argentina's eight tung mills still extracted oil.[129] Corley and Hanson predicted earning anywhere from sixty to seventy cents a pound and making $200 an acre per year.[130] In addition, they thought that improved cultivation practices and better farm machinery would modernize the tung oil industry and cement its role as a domestic crop. [131] The Clean Air Act Amendment of 1990 prohibited Volatile Organic Compounds (VOC), an action which made tung, an oil that dried chemically rather than releasing anything negative into the environment, an appealing alternative to oils that did emit VOCs.[132] Corley believed a ready market existed, and tung oil remained "the Cadillac of vegetable oils."[133] Hanson envisioned tung oil as "an agricultural industry for the 21st century."[134] With all this in mind, on November 18, 1992, Hanson formed the American Tung Oil Corporation in Lumberton, Mississippi.[135]

On November 3, 1993, Hanson went to Pearl River Community College in Poplarville to discuss his plan for roughly 5,000-10,000 acres in southern Mississippi, enough to support a tung oil mill, with potential growers.[136] Industries continued to seek tung oil, and in 1994, of the 9.3 million pounds of imported tung oil consumed, the bulk went to resins, inks, and plastics, while only 13% went to paint and varnish. Hanson and Corley understood that the consumer markets of

[129] Courtney Carter, Lisa House, and Randy Little, "Tung Oil: A Revival," *Review of Agricultural Economics* 20, no. 2 (Autumn-Winter 1998): 669-670.

[130] Patrick Peterson, "Company in Market for New Tung Oil Orchards in Mississippi," *The Sun Herald* (Biloxi), November 3, 1998.

[131] https://business.sos.state.ms.us/corp/soskb/Corp.asp?194774.

[132] Carter, 670; and "Crambe, Industrial Rapeseed, and Tung Provide Valuable Oils," http://www.ers.usda.gov/publications/ius6/ius6c.pdf, p. 20.

[133] Patrick Peterson, "Company in the Market for New Tung Oil Orchards in Mississippi," *The Sun Herald* (Biloxi), November 3, 1998.

[134] "Stage Set for Revival of Mississippi Industry," *MAFES Research Highlights* 59, no. 5 (Fall 1996), 13.

[135] "Crambe, Industrial Rapeseed, and Tung Provide Valuable Oils," http://www.ers.usda.gov/publications/ius6/ius6c.pdf, p. 20.

[136] "Tung Oil Potential Returns to Mississippi," *Waycross Journal-Herald*, December 20, 1993; and Patrick Peterson, "Company in market for New Tung Oil Orchards in Mississippi," *The Sun Herald* (Biloxi), November 3, 1998.

tung had shifted dramatically but knew demand persisted.[137] In just a few years, the American Tung Oil Corporation advised and planned orchards and milled for roughly fifteen growers in Lumberton.

Combined, these men had only 1,000 acres of tung and had formed the American Tung Growers Association (ATGA) but had problems attracting participants. Tung appealed as a niche market and helped maximize land utilization in fields and pastures through intercropping.[138] The ATGA president, Bernard DeSantis, a retired FBI agent who had twenty-five acres of tung near Poplarville, perceived it as a way to express conservationism.[139] This sentiment, along with heightened environmentalism, added yet another incentive. Hanson knew that environmental concerns had many manufacturers replacing petrochemicals and other various ingredients in varnishes and inks which they deemed hazardous to the ozone layer.[140] Because tung did not dry through evaporation, it did not release pollutants into the environment.[141] The push for biodegradables also provided a potential avenue for tung in plastics.[142] Tung growers also had the blessing of some former tung industry figureheads like W. W. Kilby, former superintendent of the Mississippi Branch Experiment Station in Poplarville, who said, "The tung industry may never be as important

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[137] "Crambe, Industrial Rapeseed, and Tung Provide Valuable Oils," http://www.ers.usda.gov/publications/ius6/ius6c.pdf, p. 20.

[138] On niche farming, see, for example, Ronald Jager, *The Fate of Family Farming: Variations of an American Idea* (Hanover: University Press of New England, 2004), 231. On planting trees in pastures and fields, see, for example, Richard J. Hobbs and Viki A. Cramer, "Why Old Fields? Socioeconomics and Ecological Causes and Consequences of Land Abandonment," in Old Fields: *Dynamic and Restoration of Abandoned Farmland,* ed. Viki A. Cramer and Richard J. Hobbs (Washington: Island Press, 2007), 1. On diversification, see, for example, Helena Norbert-Hodge, Peter Goering, and John Page, F*rom the Ground Up: Rethinking Industrial Agriculture* (New York: Zed Books, 1993, revised 2001), 55; and Paul A. Wojtkowski, *Agroecological Economies: Sustainability and Biodiversity* (New York: Elsevier, Inc., 2008), 18.

[139] Patrick Peterson, "Company in Market for New Tung Oil Orchards in Mississippi," *The Sun Herald* (Biloxi), November 3, 1998.

[140] "Tung Oil Demand May Restore State Industry," *Clarion Ledger*, December 1, 1996.

[141] Alec J. Jarvis, "Paraguayan Tung (Aleurites fordii Hemsl.): An Important Small Farmer Crop Diversification Strategy" (M.A., Michigan Technological University, 2002), 35.

[142] E. S. Stevens, *Green Plastics: An Introduction to the New Science of Biodegradable Plastics* (Princeton University Press, 2001), 97.

economically as it was in its heyday, but it sure could be a boost."[143] Despite the enthusiasm, reestablishing the industry proved fraught with problems.

Hanson and Corley had difficulties getting sufficient support for their new tung enterprise. Labor shortages, USDA indifference, and less expensive oilseeds hampered progress. Tung trees remained confined to the Gulf Coast where land prices had skyrocketed due to tourism. Many consumers scoffed at the supposed superiority of tung oil because tung varnishes required up to six layers to acquire smoothness and peeled more often than other oilseed varnishes.[144] The refusal of local farmers to adopt tung as a crop proved especially crippling. The majority of former growers had negative memories, and most of the members of the younger generations did not recognize the tree and thought "tung oil is mutilating animals' tongues."[145] Those who did know of tung equated it with poison or with the pains of harvesting.[146] Most of the individuals who did embrace the new infant industry knew little about farming and even less about tung. Worse, the mill at the old Tung Ridge Ranch near Poplarville, Mississippi, needed 5,000-8,000 acres to function and the sum total of acreage by tung growers amounted to a mere 1,000 acres. Finding pickers to gather the tung nuts presented a challenge while mechanical harvesters borrowed from the walnut and pistachio industries frequently picked up rocks. Obstacles aside, the first crushing took place in 1998. What little oil the mill processed that year and in the years that followed went mainly to resin companies along the Gulf and to large manufacturers in Chicago and Japan.[147]

Hanson and Corley continued operating their American Tung Oil Corporation until August 29, 2005, when Hurricane Katrina, the worst hurricane since Camille, reached the Mississippi coast. Orchard

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[143] "Tung Oil Demand May Restore State Industry," *Clarion Ledger*, December 1, 1996.

[144] Bob Flexner, "Oil Finishes: Four Different Types with Different Characteristics," *American Woodworker*, no. 28 (Oct. 1992), 48; and "Oil Finishes: Myths and Misunderstandings," *American Woodworker,* no. 28 (Oct. 1992), 51.

[145] John Corley, interviewed by author, April 3, 2012, tape recording.

[146] On poison fears, see, for example, W. R. Horne, "Tung Nuts are Toxic," *American Woodworker*, no. 39 (Aug. 1994), 4.

[147] Corley interview; and "Crambe, Industrial Rapeseed, and Tung Provide Valuable Oils," http://www.ers.usda.gov/publications/ius6/ius6c.pdf, p. 20.

damages warranted replanting, but Hanson and Corley did not want to expend funds on a new nursery and then to wait three years for a harvest when more profitable crop avenues existed. To this day, the company has 3,000 tung trees, but no longer harvests the nuts. Corley, for one, thinks tung trees would make great shade trees for cattle but does not foresee the creation of a new domestic tung oil industry. In his words, "Any time an industry completely leaves a country, it is extremely difficult to bring that industry back."[148] This attempt may have failed, but yet another endeavor to restart the tung industry is underway but this time in Florida.

In 2010, Gregory A. Frost, executive services director of the Tallahassee, Florida, Police Department, and his wife Maureen decided to grow tung. After years of watching their children play ball with the nuts of a tung tree in their yard, they sought ways to produce their own tung oil for furniture varnishes. The two did some investigating and quickly discovered the rich history of domestic tung tree production, wondered about modern feasibility, and outlined four reasons for initiating plantings. First, the original domestic tung oil industry began in Tallahassee so the tree had local roots. Second, they saw tung oil as a green product that would mesh nicely with the environmental movement. Third, they believed consumption of domestic tung oil fit nicely with the "Made in America" movement. Fourth, countless companies applied tung oil in an array of products while other uses remained undiscovered.[149] After forming Gulf Coast Tung Oil, LLC in 2011, the couple began planting. They currently have some fifty acres of tung trees in Jefferson and Leon Counties.[150] Domestic companies like Sutherland Welles have agreed to buy any tung oil the Frosts produce.[151]

Tung as Crop or Invasive Plant

Aside from visionaries like Hanson, Corley, and Frost, most coastal residents considered the tung tree a pest. In the words of Corley, the

[148] Corley interview.

[149] Greg Frost, interviewed by author, July 18, 2012, tape recording.

[150] Lazaro Aleman, "Why the Tung Oil Industry Might be Making a Comeback," *850 Magazine* (Oct-Nov 2014), http://www.850businessmagazine.com/October-November-2014/Why-The-Tung-Oil-Industry-Might-Be-Making-a-Comeback/.

[151] Frost interview.

tung tree, commonly growing in ditches and along fences and roads, was seen as a "plant out of place."[152] The 1974 Noxious Weed Act let the USDA control exotic plants and allowed the Animal and Plant Health Inspection Center (APHIS) to monitor forbidden or unwanted plants. In 1977, President Jimmy Carter passed Executive Order 11987 for the purposes of supervising foreign plants, but funding problems prevented it from becoming particularly efficient.[153] In 1999, tung came under the scrutiny of President Bill Clinton's National Invasive Species Council (NISIC).[154] By the mid-2000s, for example, tung had become a Florida Exotic Pest Plant Council (FLEPPC) Category II invasive species meaning it had increased in number but had not yet caused any ecological damage.[155] Unlike kudzu, a plant introduced in 1876 to address erosion concerns and soon referred to as the 'vine that ate the South,' tung trees did not do that much damage and helped prevent erosion.[156] While some saw the tung tree as a "novelty," others saw no redeeming value.[157]

The bulk of negativity directed toward tung trees dealt mainly with their tendency to multiply wildly, compete with native plants, and produce poisonous nuts. Some landscapers recommended tung for their beauty.[158] Others saw them as blights.[159] The aesthetic value of tung plants did little to dissuade landowners in northern Florida from removing wild trees, which were common. As a matter of fact, between 1993 and 1995, about 900 tung trees were eradicated from

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[152] John Corley, interviewed by author, April 26, 2011, tape recording. On tung still seen in ditches and along roadsides, see, for example, Latimore Smith, "The Legendary Longleaf Pine Forests of the Florida Parishes: Historic Character and Change at the Hand of Man," in *Fierce and Factious Frontier: The Curious Development of Louisiana's Florida Parishes, 1699-2000*, edited by Sam C. Hyde (Baton Rouge: Louisiana State University, 2004), 151.

[153] Philip J. Pauly, Fruits and Plains: *The Horticultural Transformation of America* (Cambridge: Harvard University Press, 2007), 240.

[154] Pauly, 243, 246.

[155] Karen Brown and William Keeler, "The History of Tung Oil," *Wildland Weeds* 9, no. 1 (Winter 2005), 6.

[156] Megan Friedman, "Kudzu," *TIME*, February 2, 2010.

[157] George H. Dukes, Jr., *Trees of Mississippi and Other Woody Plants* (Brandon, MS: Poplar Petal Publishing Company, 1997), 184.

[158] *Trees for Louisiana Landscapes: A Handbook*, LSU Agricultural Center, 1996, 58.

[159] Neil Odenwald and James Turner, *Identification Selection and Use of Southern Plants for Landscape Design* (Baton Rouge: Claitor's Publishing Division, 1987), 22.

the Lake Jackson Mounds State Archeological Site near Tallahassee.[160] A book titled *Edible and Useful Plants of Texas and the Southwest* claimed that every single part of a tung tree contained poison.[161] An issue of *Louisiana Wildlife News* reported that because of its toxic nature, "tung-oil has no wildlife value and should even be eradicated where cattle and other livestock are grazed . . ." and "the ingestion of a single seed by humans can be fatal."[162] Quite the contrary, it proved common for tung growers to have livestock in their orchards to better utilize land and provide shade and tung ingestion research revealed no fatalities, just illnesses so this argument lacked foundation. Nevertheless, gardener Harriet Daggett wrote upon discovering this potentially dangerous side to tung, "I am not as enamored with this tree as I once was and may condemn it to the trash heap . . . better to be safe than sorry."[163] Given that poisonous plants like oleander, angel trumpets, mountain laurels, and azaleas abounded, this aversion seems unfounded. In addition, the occasional sterile tung tree grew large and lush and did not produce nuts so it posed less of a concern.[164] For the most part, however, tung remained something of a pariah while receiving its share of positive advertising.

Remnants of Tung Culture

Tung trees sometimes received mention in many types of books. Gaye Gompers mentioned the former profitability of domestic tung in her biography *The Laughing Grandmother!: (Princess Moonfeather—Cherokee Indian)* and Jeanette Dyess Ryan talked of tung nut gathering

[160] K. A. Langeland, H. M. Cherry, C. M. McCormick, and K. A. Craddock Burks, *Identification and Biology of Nonnative Plants in Florida's Natural Areas—Second Edition* (Gainesville: University of Florida, 2008), 69.

[161] Delena Tull, *Edible and Useful Plants of Texas and the Southwest* (University of Texas, 2003, 2nd edition, 1st 1987), 285.

[162] "Plant Species Profile: Tung-oil Tree (Aleurites fordi)," *Louisiana Wildlife News* 5, no. 3 (May 2010), 4.

[163] Harriet Daggett, "Tung Tree—beautiful but dangerous," *The Seedling: Newsletter of the Northwest Louisiana Master Gardeners Association* 13, no. 5 (Sept./Oct. 2010), 4.

[164] T. A. Rinehart, N. C. Edwards, Jr., A. L. Witcher, "Lack of Tung Nut Production in a Potentially Sterile, Late-Flowering Ornamental Tung Oil Tree (Aleurites fordii)," Southern Region American Society for Horticultural Science, Feb. 6-8, 2010, Orlando, Florida.

in *Dreams of a Farmer's Wife*.[165] The uses of tung oil, the beauty of tung blossoms, and the decline of the domestic industry are mentioned in novels like *The Old Man Down the Road* by Ken Hall, Jr., and *A Tinker's Damn: A Novel* by Darryl Wimberley.[166] Others, like Julie Hecht's *Do The Windows Open*, talk vividly of modern tung oil usage in houses.[167] Tung in other countries is mentioned in John Saintsbury's biography *A Man in Many Streets*, Herbert L. Way's *Round the World for Gold: A Search for Minerals from Kansas to Cathay*, Norman Kerr's novel *The Gunsmith: A Novel*, and the historical fiction work *Vestal Virgin: Suspense in Ancient Rome* by Suzanne Tyrpak.[168] Literature is only one of many ways in which tung continues to touch the lives of Americans.

Residents of the Gulf Coast do not have to look far to see reminders of tung. Street and road names with the word tung are plentiful.[169] Picayune, Mississippi, now embraces its connection to tung by holding a yearly Tung Blossom Festival and 5-K Blossom Run.[170] Former tung plantations now provide the grounds for the Money Hill Golf and Country Club (Covington, Louisiana), the Merrywood Estates housing development, and Normandy House Bed & Breakfast (both part of the Normandy Plantation in Folsom, Louisiana). The WPA Tung Oil mural is still on display in the old Covington Post Office which is now the St. Tammany Parish School Board District Annex, and a copy hangs in the

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[165] Gaye Gompers, *The Laughing Grandmother!: (Princess Moonfeather—Cherokee Indian)* (Author House, 2006), 433; and Jeanette Dyess Ryan, *Dreams of a Farmer's Wife* (iUniverse, 2011), 101, 112.

[166] Ken Hall, Jr., *The Old Man Down the Road* (Author House, 2011), 39; and Darryl Wimberley, *A Tinker's Damn* (Toby Press, 2007), 54.

[167] Julie Hecht, *Do The Windows Open?* (Penguin, 1998), 202-211.

[168] John Saintsbury, *A Man in Many Streets* (Author House, 2007), 58-63; Herbert L. Way, *Round the World for Gold: A Search for Minerals from Kansas to Cathay* (London: Sampson Low, Marston & Company, LTD, 1912), 282; Norman Kerr, *The Gunsmith: A Novel* (Trafford, 2009), 52, 53, 108, 110; and Suzanne Tyrpak, *Vestal Virgin: Suspense in Ancient Rome* (Create Space, 2011), 190-191, 299.

[169] Tung Oil Road, Leakesville, Mississippi,; Tung Tree Drive, Picayune, Mississippi; Tung Tree Drive, Lumberton, Mississippi; Tung Street, Richton, Mississippi; Tung Oil Grove Road, Bogalusa, Louisiana; Tung Road, Bogalusa, Louisiana; Tung Oil Road, Florala, Alabama; Tung Avenue North, Theodore, Alabama; Tung Avenue West, Theodore, Alabama; Tung Grove Road, Tallahassee, Florida; and Tung Hill Drive, Tallahassee, Florida. Based on Google Maps.

[170] "Street Festivals," Picayune Main Street, accessed 2015, https://picayunemainstreet.com/festivals/.

Money Hill Golf and Country Club. Tung is used as a yard decoration and can be purchased online or from private vendors specializing in exotic plants. Since 2008, some tung trees can be seen in the Smoky Mountain National Park in Tennessee.[171] While it might be said that tung is largely forgotten, evidence of its contributions to the past and present are there for those who look, and its cultural relevance is unquestionable.

Today tung oil continues to hold a place in American life. Tung oil is still used to line tin cans, as glue in marine plywood, in magazine gloss, paints and varnishes used on furniture, houses, seagoing vessels, and caskets. Synthetic lacquers have come to dominate the paint and varnish industry, but tung oil maintains a role.[172] Tung oil like Formby's Tung Oil and Waterlox Original Tung Oil can be found anywhere from Lowe's and Home Depot to Amazon and Ebay. Some varnish companies stress tung in advertisements when their products are primarily composed of less expensive linseed oil.[173] More importantly, the federal government uses tung oil in inks on paper currency.[174] In this way, perhaps more than any other, every single American is connected to tung oil. Given the growth of the environmental movement in recent years, many producers of tung varnishes have started to promote their organic product as an environmentally safe choice.[175] Pharmaceutical advances included discoveries that the conjugated fatty acids in tung oil aided the immune system and might even be used as a cancer preventative.[176] Louisiana State University and Mississippi State

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[171] Langeland, 69.

[172] Fred Cottrell, *Energy and Society: The Relation Between Energy, Social Change, and Economic Development* (Author House, 2009), 405.

[173] Corley interview, April 26, 2011; and Ching T. Hou and Jei-Fu Shaw, ed., *Biocatalysis and Agricultural Biotechnology* (Boca Raton: CRC Press, 2009), 21.

[174] "History of Tung Oil: The Key to the Waterlox Products of Today" http://www.waterlox.com/uploads/docs/Tung-oil-hotlink-story-REVISED-2.pdf; and "Tung Oil as Hardwood Floor Finish: Introduction," http://lesstoxicstuff.com/2011/07/hardwood-floor-finish-tung-oil-and-my-personal-experience-with-it/.

[175] See, for example, "How Sustainable are Reclaimed Building Materials?" www.greenBuilder360.com.

[176] Fuquiang Tang, John M. Dyer, Alan R. Lax, Ding S. Shih, Dorselyn C. Chapital, and Armand B. Pepperman, "Nucleotide Sequence of a cDNA Clone for Omega-3 Fatty Acid Desaturase (Accession no. A061027) from "Aleurites Fordii Seeds," Plant Physiology 119, p.364. People allergic to nuts might be affected by tung oil varnishes "Frequently Asked Questions," http://www.waterlox.com/project-help/faqshow.aspx?faqid=20.

University began experimenting with tung oil as a biodiesel/biofuel.[177] Due to its acidity and tendency to ignite, it does not fare well alone but performs satisfactorily in biodiesel mixtures.[178] Some scientists are even attempting to duplicate tung oil qualities in non-toxic, cheaper, and more productive crops like soybeans through biogenetics.[179] With all of these avenues, tung oil will continue to attract experimentation and as such, may play a greater role in years to come.

"The crop that was" description of tung in *Alabama Heritage* encapsulated the rise and fall of the former industry in four words, but recent events beg the question "or was it?"[180] Facing foreign competition, alternative oilseeds, and synthetic oilseeds, tung oil struggles in a competitive market. Tung may be grown as a niche crop, but large-scale production is unlikely. Even so, as long as there are men like Hanson and Frost, the notion of a new and improved domestic tung oil industry will persist.[181] Tung trees can still be found throughout the Gulf Coast and have even spread to northern counties of gulf states and as far north as Tennessee.[182] Many might condemn tung trees as an invasive species but in a globalized world, the very notion of 'nativeness,' according to *TIME*, might be "becoming

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[177] On Louisiana, see http://www.lsuagcenter.com/NR/rdonlyres/78689161-0E15-406F-B605-B827B7D06ABE/62115/BioenergyResearchin20092.pdf. On tung oil as a biodiesel, see also, Ahindra Nag, Biofuels Refining and Performance (McGraw-Hill Professional, 2007), 137-140.

[178] On tung as a biofuel, see, for example, Sylvain-Didier Kouame, Biodiesel (CreateSpace, 2010), 11-12. See also, Ji-Yeon Park, Deog-Keun Kim, Zhong-Ming Wang, Pengmei Lu, Soon Chul Park, and Jin-Suk Lee, "Production and Characterization of Biodiesel from Tung Oil," *Applied Biochemistry and Biotechnology* 148, no. 1-3 (2008): 110, 117.

[179] "Tung Twister: Powerful Enzymes from Tung Trees Could Turn Plants into Oil-Producing Marvels," http://www.ars.usda.gov/is/AR/archive/aug07/tung0807.htm?pf=1 ; and John M. Dyer and Robert T. Mullen, "Engineering Plant Oils as High-Value Industrial Feedstock for Biorefining: The Need for Underpinning Cell Biology Research," Physiologia Plantarum 132 (2008), 14.

[180] Davenport, 53.

[181] "Startups Making the Most of Training Series," *Tallahassee Democrat*, August 21, 2011.

[182] For other recent scholarship on the tung industry, see, Jeffrey B. Robb and Paul D. Travis, "The Rise and Fall of the Texas Tung Oil Industry," *East Texas Historical Journal* 51, no. 1 (Spring 2013), 86-96; and Jeffrey B. Robb and Paul D. Travis, "The Rise and Fall of the Tung Oil Industry," *Forest History Today* 19, nos. 1 & 2 (Spring/Fall 2013), 14-22. For counties in which tung trees are still found, see, http://www.invasiveplantatlas.org/subject.html?sub=6592#maps.

an oxymoron."[183] Others might agree with *Down South* writer Evelyn Reid Griffith who once wrote, "So in the Deep South, looking through the clouds of blossoms in the spring, we like to think that oil is flowing from the trees."[184] Whether or not the domestic tung oil industry makes a vibrant comeback, the tung tree has become an inherent part of the environment and is here to stay.

[183] Bryan Walsh, "In a Globalized World, Are Invasive Species a Thing of the Past? *TIME*, June 14, 2011.

[184] Evelyn Reid Griffith, "Pink Clouds in Dixie," *Down South* (Mar.-Apr. 1957), 25.