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# Technology and Adaptation in Logging

Jeremy D. Rosenblad

Western Oregon University, [jhonpauljones2001@gmail.com](mailto:jhonpauljones2001@gmail.com)

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Jeremy Rosenblad  
Technology and Adaptation in Logging.  
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Between 1880 and 1917 there was a dramatic shift in technology with the coming of mechanization. This dramatic process, which started just after the end of the American Civil War, in a Period of Transition (1870-1880) would continue to gain speed with the Period of Rapid Advances (1880-1900) in technology all the way to the start of the First World War with the Rapid Proliferation of Technology (1900-1917) into everyday life. As a result of these shifts loggers, mill owners and their respective associations that represented them and the logging industry as a whole, in the Pacific Northwest, were increasingly able to adapt to an increasingly changing economy and market.

I have set up these time periods because I feel that they best represent the changing environment and allow for an easier discussion of the topic. I plan to use these periods to break up the information and to use primary as well as secondary sources in my analysis of the topic. My sources cover the technology and the problems that came with the development, introduction, and spread of that technology. Primary sources include period industry magazines, such as *The Timberman*, which was published in Portland, and acted as a forum for the timber industry throughout the Pacific Northwest. I will also use court cases from *The Pacific Reporter* and *Cases Determined in the Supreme Court of Washington* as a source of information on the logging industry. I had originally intended to focus on accidents and the resulting legislation purely related to the logging industry but had difficulty with finding cases that were clearly a result of ignoring safety, at the time I was doing research. Secondary sources include books written in the latter half of the 20<sup>th</sup> century that reflect back on the turn of the century. The books I am using focus on the technology used in logging, the powerful lumber associations, the people that influenced the industry and the reflections of people who were involved in the logging industry during the early part of the 20<sup>th</sup> Century.

Countless authors, at the turn of the century and since, have reflected upon the logging industry. The majority of books focus on the history of the logging railroads and tramline, sawmills, the specific types of trees that were logged, or on a combination of all three since each topic was among the most visible aspects of the logging industry.

*Head Rig: The Story of the West Coast Lumber Industry*, by Ellis Lucia, 1965, which looks at the detailed history of the lumber industry from the 1910's up until the late 1940's. Lucia chooses to start the history of about 1910 in the midst of economic, social and political change in the lumber industry on the Pacific and with the complex system of lumber associations, that had developed over the previous ten years. Being in competition with one another, they now formed a new association to work together as one organization. The history of the association and the pacific logging industry is then tied together throughout the rest of the book in a continually positive fashion while yet admitting that problems, such as strikes, forest fires, and wastes, existed in the logging industry and how much of a problem they were. Ellis Lucia book is also full of cursing, which was surprising, by the author on all sorts of "sore" subjects which make for a very passionate and unique perspective on just how the author viewed and what the authors opinion on the subject was<sup>1</sup>.

*Logging the Redwoods*, by Lynwood Carranco and John T. Labbe, 1975, which looks at the history of the Redwood logging industry in California and how they dealt with the extreme difficulty and wastage that came with logging the redwoods. They also focused on the challenges of felling, and then moving, the massive logs out of the redwood forests. They also focus on the speed of lumber production from when it was all done by hand, in the early years, to that of an organized machine that worked extensively with railroads and "Donkey Engines" to move logs

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<sup>1</sup> Ellis Lucia, *Head Rig; The Story of the West Coast Lumber Industry*, (1st ed. Portland, OR.: Overland West Press, 1965).

sometimes more than 20 miles overland to the mills, later gasoline powered trucks were used, to haul redwoods out of the forest<sup>2</sup>.

In, *Lumber and Politics: The Career of Mark E. Reed*, by Robert E. Ficken, 1979, we see the lumber industry from a different perspective than previously seen in *Head Rig*. In *Lumber and Politics* Ficken follows the life and political life of Mark Reed who was an influential position as a mill owner who worked as an elected legislator to advocate progressive reforms that helped the mill owners both limit costs and provide workers with compensation for accidents as well as improve conditions in the lumber camps with the added benefit of defusing increasing unrest from workers about the conditions<sup>3</sup>.

*Hard Times in Paradise*, by William G. Robbins, 1988, also follows the logging industry through history but focuses on the development of the logging industry in Coos Bay and its relationship within a national frame work of connections to the outside world as well as its regional importance in relationship to other locations within the State of Oregon. Robbins focuses more on the collected experiences of individual people involved with the logging industry, and what they had to say, and how they perceived the industry as it evolved and changed with the economy and with national developments that affected the local industry<sup>4</sup>.

*Technology in America*, by Alan I. Marcus and Howard P. Segal, also cover this time period but unlike the previous two books there is a lack of individualism in it and at times it skips minor details for clarity with the story of the development of logging between 1870 and 1920. They focus on the systemization of America but I focused my reading on the section about

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<sup>2</sup> Lynwood Carranco, and John T. Labbe, *Logging the Redwoods*, (Caldwell, Idaho: Caxton Printers, 1975.)

<sup>3</sup> Robert E. Ficken. *Lumber and politics: the career of Mark E. Reed*, (Santa Cruz, Calif.: Forest History Society, 1979.)

<sup>4</sup> William G. Robbins. *Hard Times in Paradise: Coos Bay, Oregon, 1850-1986*, (Seattle: University of Washington Press, 1988.)

systemization of the logging industry and the introduction of recent inventions such as electric lighting and advanced bandsaws in the mills. The electric lighting and advanced bandsaws allowed mills to run extra shifts at night and limit waste in the process since bandsaws had thinner blades. Although, from my reading of primary sources, it seems that most mills only ran a daytime shift and rarely ran a second shift unless there was enough demand to warrant it. Marcus and Segal also focus on the emphasis of overall efficiency in production, of lumber, in the mills, a rapid adaptation of new technology as it becomes available and the elimination of wood waste, as a way to increase profit margins and lower expense, by putting the waste to use in number of side products such as a fuel source<sup>5</sup>.

Unlike Robbins, in *Hard Times in Paradise*, Marcus and Segal focus mainly on the technical progress, process and innovation occurring in America over the developments, and relationships, occurring in a regional area including, and surrounding, Coos Bay, Oregon. *Logging the Redwoods* covers the history in California of logging the redwood forests and the technical developments that were needed and invented by the industry to ship and move the product which ties into part of Robbins *Hard Times in Paradise* as he covers the technical developments and their impacts on Coos Bay, Oregon.

*Head Rig: The Story of the West Coast Lumber Industry*, by Ellis Lucia and *Lumber and Politics: The Career of Mark E. Reed*, by Robert E. Ficken, cover the logging industry from two different threads that have a lot of overlap. Lucia focus on the direct history of the logging industry until the merging of associations to become the West Coast Lumberman's Association. Similarly, *Lumber and Politics: The Career of Mark E. Reed*, by Robert E. Ficken, Mark Reed changed the industry on the political front. When combined together, give a much better idea of

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<sup>5</sup> Alan I. Marcus and Howard P. Segal, *Technology in America: a brief history*, (San Diego: Harcourt Brace Jovanovich, 1989.)

the problems and issues being faced by the industry at the time. What every single author discusses at some point is the railroads and the need that the lumbermen had for the railroads and then problems that the railroads caused the lumbermen and the things the lumbermen did to resolve this.

Before shift to mechanization, from horse and oxen, into the Period of Transition (1870-1880) logging was mostly by animal and hand power at each step in the system. This occurred from stump to mill by using skid roads, tramways, natural rivers, or with a narrow gauge railroad. The lone exception in generally static development was in the mill itself which increasingly, throughout the region, became steam powered, rather than water powered. Water power had impaled natural limits on production due to the rise and fall of the water level throughout the year due to the freezing of the river, and streams, in the winter months. The river also dictated the extent of the logging operations by its length, water depth and the condition of the riverbanks of the river. These combination of factors, helped to dictate the ease with which logs could be moved into the rivers. A steam-powered mill was also, in the 20<sup>th</sup> Century, no longer dependent upon the seasons of the year to function, like that of a water-powered mill, and, under ideal and even less than ideal conditions, it could run in all but the coldest of temperatures by using the exhaust steam, of the mill's steam engine, to keep the log storage ponds free of ice by injecting the steam into the stream or log holding pond, to prevent it from freezing over and thus keeping the mill open<sup>67</sup>.

The Period of Transition was a period slow, by comparison, with later periods, and steady growth in the logging industry as it expanded up and down the Pacific Coast into inlets and

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<sup>6</sup> "Among The Sawmills of Oregon." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 32-A.

<sup>7</sup> Marcus, *Technology in America*, 199.

rivers dotting the coast line. Logging techniques were based upon conditions of geography, time, and costs. The goal, as with any large industry, was efficiency of production. In logging it was getting the most trees, soundly, to the mill for the lowest possible cost. By soundly, I mean that the last thing the mill owners wanted to do to was waste timber by damaging the logs through felling them, in the forests, and through transportation from the forests to the mill. Because the timber could usually be cut and moved as fast as, or faster, than the mills could cut it, the mill owners, tended to cut down more trees than they needed for the winter months when it was usually more difficult to obtain fresh logs from the forests. This meant keeping production of logs flowing in a timely fashion, so as to not waste possible future production time in the winter by running out of logs although not all mills operated during the winter, during the daylight hours<sup>8</sup>.

Horse and oxen in logging were the backbone of the logging industry well into the 1880's and lasted in some part into 1915 due to local conditions or preference<sup>9</sup>. Horses and oxen were used extensively as the primary movers of logs throughout the forests of the Pacific Northwest. Horses and, more likely, oxen were used to haul logs from the forests on a skidding road, normally called skid roads, which were specially prepared roads that were designed to allow the logs to slide as easily as possible over the ground by eliminating as much friction as possible<sup>1011</sup>. In order to make it even easier on the Oxen, the trees would be stripped of their bark, in the forest, in order to provide as smooth a surface as possible to reduce friction. The bark and trimmed limbs were left in the forest as waste or burned on-site to allow for easier removal of the

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<sup>8</sup> "With the California Sawmills." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 39.

<sup>9</sup> Carranco, *Logging the Redwoods*, 28.

<sup>10</sup> Carranco, *Logging the Redwoods*, 13-14.

<sup>11</sup> Carranco, *Logging the Redwoods*, 31.



timber<sup>12</sup>. Other ways to reduce the friction would be to cut notches on the cross poles that made up the road bed of the skid road, and apply tallow to the front of the logs being skidded to allow logs to slide easier<sup>13</sup>.



Horses and Oxen were also used to haul logs by means other than ground skidding, which was the most common method. Tramways and Wagons also were used and reduced the friction with moving logs through the forest to the mill at the expense of complexity, due to the need for wooden or iron rails for the tramway and a prepared road for the wagons, and expense to maintain<sup>15</sup>. But the tramways and roads did allow for the transportation of larger, denser logs, over softer ground and over longer distances, of up to 20 miles, to the nearest mill or river for

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<sup>12</sup> Carranco, *Logging the Redwoods*, 29.

<sup>13</sup> Jerome D. Budy and James A. Young, *Endless Tracks in the Woods*. (Sarasota, FL: Crestline Pub., 1989.) 14.

<sup>14</sup> Fig. 1. Nannie M Escola. Skid road on the right with the logs being piled up on the banks in preparation for being driven down the stream to the mill. Photographic Print. Source: Lynwood Carranco, and John T. Labbe, *Logging the Redwoods*, (Caldwell, Idaho: Caxton Printers, 1975.) 13.

<sup>15</sup> Carranco, *Logging the Redwoods*, 30-31.

transportation to the mill, by comparison with the slower and cheaper method of just ground-skidding the log<sup>16</sup>.

To keep transportation costs down loggers typically moved logs to the nearest river or stream and floated the logs down river to the mill. Sometimes, when a deep river was not available, a stream of water would be diverted into a V-flume, which was a “V” shaped channel made out of lumber, with the logs floating in a few feet of water for, sometimes, many miles before ending in a pond of water into which the logs fell<sup>17</sup>. The V-flumes had the advantage over many other forms in that they could be placed in rugged terrain at a cost cheaper than railroads but are limited to their design specifications on how large, in diameter, of a log they can handle as well as, how long of a log they can handle, unlike a railroad which is less limited on how big the diameter can be and how long the logs could be<sup>18</sup>.

Whenever the flumes, large rivers and small streams, tramways or skid roads were not efficient enough, or cost effective enough, or able to handle large logs, loggers turned to the narrow gauge railroads to move the logs for them. Railroads, narrow gauge included, presented a problem as they could not be made as crudely as a tramway, skid road or V-flume. With a narrow gauge railroad the loggers did catch a break in that they could run rails into sharper curves and at steeper grades, compared to standard gauge, and at a lower cost as well. By 1875 the tramroads had begun to decline in favor of the more efficient narrow gauge railroads which could haul more logs faster from the woods to the mill at an overall rate cheaper per thousand board feet with flumes being even cheaper so long as the logs were cut to a uniform length and

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<sup>16</sup> Carranco, *Logging the Redwoods*, 30.

<sup>17</sup> Carranco, *Logging the Redwoods*, 15.

<sup>18</sup> W. D. Starbird. "Log Flumes Are of Economic Value Where Conditions Are Favorable." in *The Timberman*, ed. George M. Cornwall (Portland, August 1912.) 45.

remained a uniform diameter in size<sup>19</sup>.

The Period of Rapid Advances (1880-1900) is marked by a noticeable period of explosive growth and innovation in logging, mostly by the loggers themselves and companies that directly supported the logging industry, throughout the country<sup>20</sup>. It was particularly noticeable in the Pacific Northwest where the growth was exponential, as can be seen in Washington where the annual production of timber went from 1.1 million dollars of lumber products in 1860, 1.3 million in 1870, 1.7 million in 1880, 17 million in 1890, 34 million in 1900 and 49 million in 1905<sup>21</sup>.

The introduction and use of steam powered logging engines, introduced in 1881 as the “Dolbeer Steam logging Machine” also known as a “Donkey Engine”, and its associated attachments, changed the way people thought about working in the forests and presented a great number of problems with its introduction. Such problems included communication problems between the engineer and the crews who work on setting the choke, on the logs<sup>22</sup>. The machines could do the work of whole crews of men in terms of production per day, in less, time and forced men to work faster than they had been previously been used to leading to an increase of accidents<sup>23</sup>.

Economic problems, nationally, throughout the 1870’s and 1910’s, slowed lumber production at times by forcing the mills to work at a reduced capacity, or to close, for lack of demand for wood products and also led to an increasing interest, by mill owners, to be more

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<sup>19</sup> Carranco, *Logging the Redwoods*, 53.

<sup>20</sup> Robbins, *Hard Times*, 57.

<sup>21</sup> U.S. Department of Commerce and Labor: Bureau of the Census. *Manufactures 1905 Part III: Special Reports on Selected Industries* (Washington: U.S. Government Printing Office, 1908.), 617.

<sup>22</sup> OLSEN v. SILVERTON LUMBER CO, 135 P. 1. 752. (MN. 1914)

<sup>23</sup> Robbins, *Hard Times*, 31.

"Cloyce Conine Appellant v. Olympia Logging Company Respondent." In *Cases Determined in the Supreme Court of Washington*, ed. Arthur Remington, 36, no. September 21, 1904---February 4, 1905 (1904): 345.

efficient in their operations<sup>24</sup>.

The “Dolbeer Steam Logging Machine” or more commonly known as a “Donkey Engine” was invented by John Dolbeer, of California, in 1882. The “Donkey Engine” would spread throughout the U.S. and be patented in the United States by April of 1882 and in Canada by May of 1883 although it later ended up with many patents on it as it was continuously refined in the first few years.<sup>252627</sup> The “Donkey Engine” revolutionized the hauling of logs out of the surrounding forest and to the nearest logging roads for transportation to the nearest mill as it eliminated the need by 1897, with few exceptions, for horses or oxen to move logs out of the forests and on to the nearest logging roads.<sup>28</sup> The engine was usually, about 25 horsepower but could be as powerful as 50 horsepower, and consisted of an upright boiler and steam engine connected through gears to what is known as a “Gypsy head”. A “Gypsy head” is very similar in design to that of a ships capstan in that the cable is wound around a vertical shaft and used to either haul the logs to the “Donkey Engine” by attaching one end of the engine to a stump and the other end to a log.<sup>2930</sup> It could also be used to move the engine itself by running cable to a stump and then using the winch to haul the engine through the woods and then repeat the maneuver with another stump.<sup>31</sup> Typically, the basic “Donkey Engine” was used to haul logs no more than 1,000 feet across the ground and, with later, small models, up to 1,800 feet<sup>32</sup>.

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<sup>24</sup> W. W. Peed. "Economy in Grades as Applied to Logging Railroad Construction." in *The Timberman*, ed. George M. Cornwall (Portland, December 1909.)

<sup>25</sup> Canada Patent Office. Canadian Patent Office Record, Volumes 11, Ottawa: Canadian Patent Office, 1883. 182.

<sup>26</sup> Redwood Lumber Manufacturers Association. *The Home of the Redwood: A Souvenir of the Lumber Industry of California*. San Francisco: Pacific Coast Wood and Iron, 1897. 8,11.

<sup>27</sup> Budy, *Endless Tracks*, 7.

<sup>28</sup> Redwood Lumber Manufacturers Association, 10

<sup>29</sup> Edward K. Bishop. "MODERN LOGGING IN THE NORTHWESTERN STATES." *Factory and Industrial Management*, (New York, April 1897.) 64.

<sup>30</sup> Redwood Lumber Manufacturers Association, 8.

<sup>31</sup> *Ibid.* 8.

<sup>32</sup> *OLSEN v. SILVERTON*, 752.

This rapid rate of growth in this era was, in no small part, due to the invention of new and innovative technology, such as the development of the steam donkey, in its original small size, out of San Francisco, and the increasing use of rail and river networks to move logs by tugboat and log raft, which were logs formed into raft and held together by very strong chains that gave the raft enough of a structure to ship logs safely along the coast<sup>33</sup>. Logs were also moved by annual floods and by splash dams which forced logs to float down the river to be caught at the bottom in floating booms<sup>34</sup>. In addition to technological developments, from saws, steam engines and electric lighting, there was increased demand from foreign countries, such as Japan and China, for the straight and closely grained timbers of the Pacific Northwest which were used in traditional construction<sup>3536</sup>.

In the era of Proliferation of Technology (1900-1917) there was an increased production of “Donkey Engines” to fulfill the demand and to increase production and lower overhead costs, a rise in lumber associations as Timbermen subjected more control over market and labor. The need for control arose from a need produce lumber in uniformity of standardization instead of having a bunch of regional groups doing things to their own set of standards<sup>3738</sup>. This made sense since the logging industry was going through the standardization and uniformity movements that had already been going through the civil engineering, steel manufactures and electrical engineers

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<sup>33</sup> Carranco, *Logging the Redwoods*, 39.

<sup>34</sup> Carranco, *Logging the Redwoods*, 13.

<sup>35</sup> Ellis Lucia, *Head Rig*, 132-133.

<sup>36</sup> "Pacific Coast Cargo Shipments." in *The Timberman*, ed. George M. Cornwall (Portland, December 1909.) 45.

<sup>37</sup> "With the Washington Sawmills." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 32-F.

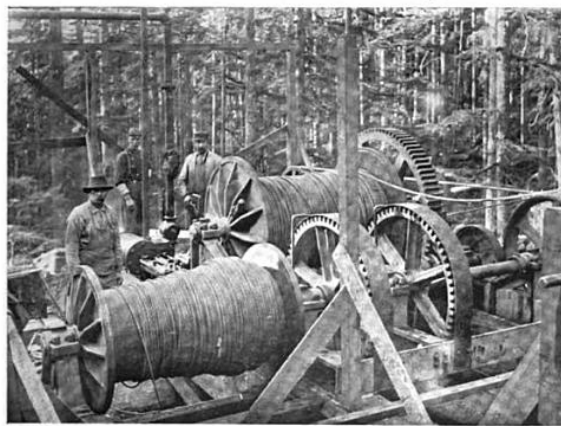
<sup>38</sup> "Good Southwestern Meeting." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 43.

society's just before, and shortly after, the turn of the 20<sup>th</sup> Century<sup>39</sup>. Large scale logging operations of 30,000 plus acres were also forming along with the logging associations in order to control of vast timber lands under one owner and continued to merge and grow larger and expand their influence through the associations, and independently, into politics<sup>40</sup>. Starting around 1892, more advanced versions of the "Donkey Engine" were being produced for the logging industry. The "Bull Donkey", for example, was basically an oversized "Donkey Engine" with larger bores and longer strokes that could be, if desired, designed to function as a compound steam engine rather than a single piston design, which increased fuel efficiency.



THE LOG CHUTE, LOOKING FROM THE BULL DONKEY.

41



THE BULL DONKEY.

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<sup>39</sup> Marcus, *Technology in America*, 165.

<sup>40</sup> Robbins, *Hard Times*, 31.

<sup>41</sup> Fig. 2. The log chute, looking from the Bull Donkey towards the horizon with twin cables for log hauling on the left hand side. Photographic Print. Source: "MODERN LOGGING IN THE NORTHWESTERN STATES." *Factory and Industrial Management*. (New York, April 1897.) 67.

<sup>42</sup> Fig. 3. The Bull Donkey with twin horizontal drums. Photographic Print. Source: "MODERN LOGGING IN THE NORTHWESTERN STATES." *Factory and Industrial Management*. (New York, April 1897.) 68.

With more than one horizontal drum, and up to four in some cases for moving logs through the air, on these newer designs, loggers began to use this setup to skid logs long distances on specially constructed skid roads, replacing the oxen and horses previously used, anywhere from 3,000 feet to 7,000 feet of braided iron cable, using the engines' much stronger horizontal drum's, that could, if it was needed, hold two to three miles of  $\frac{3}{4}$ -1½ inch thick cable which could be used to transfer lumber from a cliff top or mill to a waiting ship offshore.<sup>43</sup> Once hauled to a central location, next to the steam engine, the logs would be loaded onto a narrow gauge railroad, dumped into the river to be corralled until they could be run down the river to the mill, or hauled through the forests by several means, from a tramway and wagons or by extremely long cable lines, back to the nearest mill. The cables generally used, made up of braided steel, iron or, in some cases, Manila rope, on a logging engine's main drum would allow all of the trees within the reach of the engine to be cut and hauled to a central point using one of two general methods: skidding the logs on the ground, or Skyline Yarding with one end (or both ends) of the log up in the air to reduce effort on the engine and to reduce damage to the log<sup>44</sup>.

When skidding on the ground with the steam engine itself the logs would be arranged into trains with the first log being fixed via chain to the thick  $\frac{3}{4}$ -1½ inch cable and each additional log being fixed via chain to the tail end of the one in front of it. The "Donkey Engine" or "Bull Donkey" could also be used for, what is today labeled, Skyline Yarding, which is where the log is lifted up off the ground and moved through the air to another location, usually to a central point or location creating a circular pattern on the ground similar to that of a "Donkey

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<sup>43</sup> Redwood Lumber Manufacturers Association, 10.

Logging Machinery Dept, Lidgerwood Manufacturing Company, "Logging by Steam: Employing Improved Systems Under the Patents of Baptist, Beekman, Miller, Dickinson and Others", (New York: Logging Machinery Department of the Lidgerwood Manufacturing Company, 1905.) p: 101.

<sup>44</sup> "Lath Yarns." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 24.

Engine” being used to haul logs in on the ground to a central point.<sup>45</sup> These methods of hauling logs, out of the forests and onto a growing network of roads, tramroads, private narrow gauge tracks built by the mill owners, or even trunklines, all rail lines that branched directly off of a railroad mainline, increasingly allowed logs to be shipped to the mills at faster rates and at ever lowering costs over previous methods. By focusing on improving individual links in the chain, from stump to finished product, and Timbermen improved each link’s efficiency at moving the product<sup>46</sup>.

These operations benefit from economies of scale which pushed out large numbers of midsized logging operations. The reality ended up resembling conditions in the steel industry, in that as each link from the stump to mill was upgraded, more board-feet-per-man would be produced, meaning, lower costs, per 1,000 board feet, for the mill owner as he adopted ever newer pieces of technology<sup>47</sup>.

As problems in the logging industry were cropping up, people such as Mark Reed, a logger, mill owner and politician involved in Washington politics supporting the logging industry, and Everett Griggs, who spearheaded the merging of the regional lumber associations into a larger, more formal, lumber association that had real bargaining power, stuck their necks out and provided solutions to the problems that were impacting the logging industry, and, as a

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<sup>45</sup> Logging Machinery Dept, 8.

"Bonner, Mont." in *The Timberman*, ed. George M. Cornwall (Portland, September 1918.) 56.

<sup>46</sup> Robbins, *Hard Times*, 19.

Robbins, *Hard Times*, 28.

<sup>47</sup> Marcus, *Technology in America*, 230.

Robbins, *Hard Times*, 28-29.

"Special Cut Steel Gearing." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 46.

"Detailed Description of a New Method of Quarter Sawing Lumber." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 54.



result of the lagging legal and logging industry that was resistant to change outside their own spheres of influence<sup>48</sup>.

One of many problems with the industry, and there were many, concerned the wood itself. As late as late 1909 there was no complete standardization on the grading of wood in the industry and if there was any standardization it was in the fragmented associations that were set up to represent a single wood product like shingles or redwood. Even where there was standardization, wood was usually miss graded by the owner, due to a lack of formal inspectors. There was no enforcement of agreed upon grading scheme<sup>49</sup>.

To get what they wanted, and to have the power that they needed to get such an act passed, the three dominant associations in the Pacific Northwest were: The Pacific Coast Lumber Manufactures Association (PCLMA), The Southwest Washington Lumber Manufactures Association and, lastly, the Oregon and Washington Lumber Manufactures Association. These associations merged to form the West Coast Lumber Manufacturers Association, later called the West Coast Lumbermen's Association (WCLA), after a series of meetings in 1911 that were setup to discuss the "exceedingly independent industry". As a fractured and independent system, timbermen had no bargaining power to ask for low freight costs, for the lumber, from the railroad, which they needed to keep shipping prices down so that they could remain competitive locally and expand to other markets nationally<sup>50,51</sup>.

But it was also not just the grading of wood that was the problem. A gathering movement of conservation and future minded loggers and mill owners, who were interested in getting, not

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<sup>48</sup> Ficken, *Lumber and politics*, 24.  
Ellis Lucia, *Head Rig*, 5.

<sup>49</sup> "Evils of Shingle Industry." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 22.

<sup>50</sup> Ellis Lucia, *Head Rig*, 7.

<sup>51</sup> Ellis Lucia, *Head Rig*, 5.

just the most lumber out of a single log, but the most out of an acre of land, started to encourage mill owners to replant the logged old growth timber lands with new trees. They also recommended a system that had been catching on back east, which was to stop the practice of cutting lumber to an infinite number of one-foot-sized lengths (five, six, seven, eight foot lengths etc.) and, instead, proposed standardized lengths of two-foot increments which would make the timber easier to ship, store and stock once in a lumber yard once it left the mill. This would also enable the uniformity of sales charts and construction<sup>52</sup>. The newly established association, WCLA, used its power to take control of pricing and quality control by policing themselves with inspectors and standardizations taken from those associations, that had already been adapting them, on the east coast over the previous several years<sup>53</sup>.

The lumbermen, in the form of their large associations, also advocated for, and watched the progress on, a cooperative insurance scheme which would limit their personal costs and improve worker relations by advocating for workers compensation laws that both gave compensation to the employees, in the form of money, and protected the mill owners from expensive visits to the court room<sup>54</sup>. But this was not the only thing the association was working on. The reason for the existence of the association in the first place was due to events stretching back four years previously to a battle between the associations, who were independent, to lower the shipping rates charged by the railroads. The Oregon based association, PCLMA, had initially backed the Union Pacific, and refused to join with the other two associations against the railroads since it still had access to lower rates on the Union Pacific out of Portland, Oregon while the

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<sup>52</sup> "Odd Lengths Movement Steady Gaining Momentum With Lumbermen." in *The Timberman*, ed. George M. Cornwall (Portland, November 1909.) 35.

<sup>53</sup> Ibid. 35.

<sup>54</sup> Ellis Lucia, *Head Rig*, 7-11.

"Employers' Liability Legislation." in *The Timberman*, ed. George M. Cornwall (Portland, November 1910.) 19.

Ficken, *Lumber and politics*, 24.

other two associations had to use the Northern Pacific to get to the Union Pacific and the Northern Pacific refused to work with them<sup>55</sup>. To win the battle of the rates it took the Union Pacific, working with the Northern Pacific, to increase the shipping rates for everyone<sup>56</sup>. Once word spread the PCLMA association joined the legal fight against the railroads by raising money and sending teams of stenographers to work with the other two associations to compile statistical data on the current conditions of the lumber association and the effect of rate increases and shipping stoppages into a report. This report was used to successfully win their case with the Interstate Commerce Commission of the Federal government, which resulted in the restoration of shipping rates for the Southern Pacific and a fair rate through Portland, for the Washington logging industry, were forced on the railroads<sup>57</sup>.

And then everything, for the association, fell apart due to a downturn in the economy and overproduction of timber, due to a rise in the number of mills, that produced lumber to cash in after the 1906 San Francisco earthquake. The associations tried to control prices and were somewhat successful in this until the passing of the Sherman Anti-trust Act. A basic pricing list was put into effect in 1910 with the growing WCLMA adding in new members as time passed. The organization, however, confronted a series of changes in the industry due to a downturn in the economy<sup>58</sup>. Changes in the association included taking advantage of advertising the Pacific Northwest lumber, and timber products. since advertising was a piece of technology that, for the most part, had been avoided, on a national level, in the industry, in part, due to fluctuating railroad shipping rates and in part a general reluctance, by lumbermen, to spend money on something they didn't fully believe would be worth the money since people buying the lumber

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<sup>55</sup> Ellis Lucia, *Head Rig*, 62.

<sup>56</sup> Ellis Lucia, *Head Rig*, 62.

<sup>57</sup> Ellis Lucia, *Head Rig*, 63.

<sup>58</sup> Ellis Lucia, *Head Rig*, 70.

and timber could not see or experience the product for themselves<sup>59</sup>. The campaign to promote cedar, which was conducted by sending shavings of cedar for free through the mail as a moth repellent, was an advertising success and led the WCLMA to promote itself at national expositions throughout the East Coast as it touted the uses of Douglas Fir and other western woods<sup>60</sup>.

The economy would only get worse, even with the completion of the Panama Canal, with production and business continuing to drop into 1914 and it would take the First World War to reorganize the Northwest further and to solidify its position by finally dealing with more pressure from labor. Mark Reed had, back in 1911, with the help of other lumbermen, succeeded in passing a workman's compensation act that limited the cost to owners and compensation to workers, which was important because before then there was not much in the way of any support for a worker injured on the job<sup>61</sup>. In early 1917, Mark Reed succeeded in getting another bill passed to promote education of employers and promote the advantages of workers safety<sup>62</sup>. During the war the industry finally got the efficiency they were looking for with the railroads when shipping cross country went from 40 to 60 days in transit from the Pacific Northwest to just eight to 10 days when shipping timbers used in a single wooded ship in the form of a whole train, of 35-40 cars, instead of piecemeal of one carload at a time that would be sent as it was filled<sup>63</sup>.

The industry, in the end, adapted to the changing conditions of technology and it surprised me that it managed to survive at all. The industry was almost always, even during the war with a labor shortage, able to produce as much, or more, timber for the demand during the

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<sup>59</sup> Ellis Lucia, *Head Rig*, 74.

<sup>60</sup> Ellis Lucia, *Head Rig*, 76.

<sup>61</sup> Ficken, *Lumber and politics*, 29.

<sup>62</sup> *Ibid.*, 29.

<sup>63</sup> Ellis Lucia, *Head Rig*, 90.

war<sup>64</sup>. To top off their organizational efforts they managed to defuse a labor crisis and send the I.W.W, International Workers of the World, packing after finally agreeing to an eight hour work day and ending, for the time being, labor problems that had existed for over a decade<sup>65</sup>. This all, in the end, from technological developments, which reduced labor costs, to strong labor support, from a safer working environment, through industry self-regulation and education to and an, eventual, eight hour workday by an industry that was recognizing the need to adapt, and adapt quickly lead to, overall, a more efficient and profitable industry that could survive future challenges.

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<sup>64</sup> Ficken, *Lumber and politics*, 31.

<sup>65</sup> Ficken, *Lumber and politics*, 39.

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