History of Yard Lumber Size Standards

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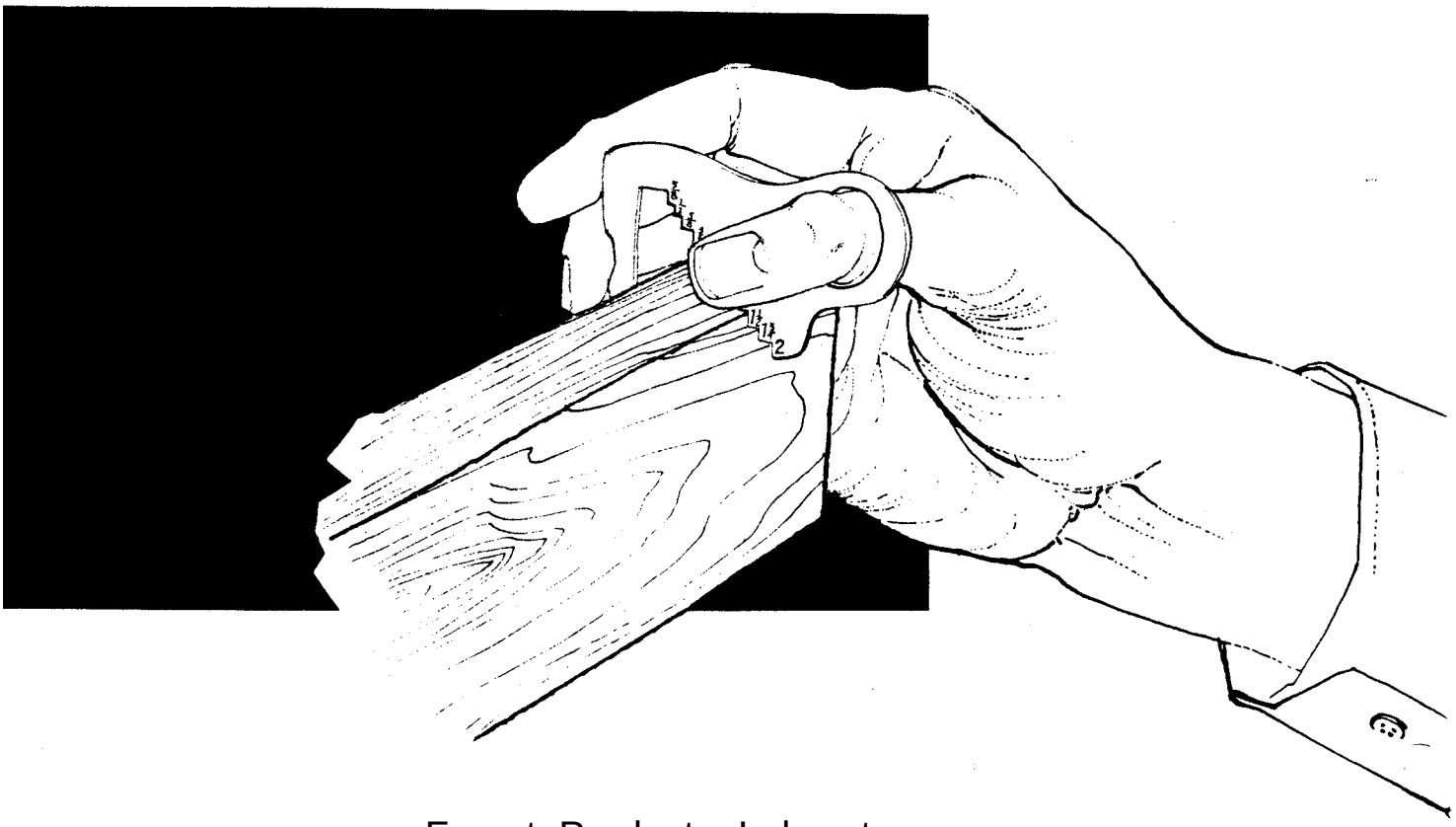

Forest Products Laboratory
Forest Service
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HISTORY OF YARD LUMBER SIZE STANDARDS

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Summary

Lumber size standards came into being almost a century ago to meet the need for a common understanding between the mill and markets that were separated by increasing distances of rail or water transportation. Early concepts called for rough lumber to be of full nominal size, often in the dry condition. After World War I, the increasing demand for construction lumber led to the first national size standard in 1924. This was revised in 1926, 1928, 1939, and 1953, while still another revision is proposed for adoption in 1964.

Demand for lumber in World War II led to the shipment and use of large quantities of lumber dressed green to standard sizes. That use has continued to the present time, while experience has accumulated on how to deal with the seasoning and shrinkage of lumber in place in a structure. The proposed new lumber standard recognizes both green and dry lumber, requiring the former to be of larger size so that both will be of the same size when they reach the same moisture content in use.

Economic pressures among the regional areas of lumber production have resulted in a decrease of standard lumber sizes over the period covered by this history.

Introduction

Declining markets for lumber have been a source of grave concern for the lumber industry and the Forest Service. The industry has studied its marketing problems and concluded that thinner sizes of boards and dimension are desirable. These proposals have far-reaching effects and have provoked widespread discussion. The purpose of this report is to summarize the background of yard lumber size standards and thus to add depth and meaning to the discussions.

Standards of size, weight, and quantity have been with us for a long time. Such standards are necessary to a common understanding of value. Standards can be amended or changed. For example, the inch of today is much different from the "three barleycorns" of ancient England. Changes of standards may result from changing economic conditions, but important technical considerations may also be involved.

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Today's close competition within the lumber industry and between lumber and other building materials has tended to emphasize price over quality. A smaller size means a lower price for a piece of lumber to do a specific job. It has always been recognized, however, that lumber must give satisfaction if it is to hold its markets. Technical questions of the lumber size necessary to do a particular job satisfactorily have therefore been a continuing part of the discussion of lumber size standards. An analogy might be that a man who has eggs to sell in a distant market can offset transportation costs by furnishing smaller and therefore cheaper eggs--provided the customer will accept and be satisfied with the smaller eggs.

In any consideration of lumber standards, the basic rough green thickness of common boards and dimension lumber is often the focalpoint of discussion. Sometimes the rough green size is confused with the "set-out" (amounts by which the log is advanced between cuts of the saw). The set-out includes the saw kerf, which is a variable. As a result, one producer might set 1-1/8 inches to saw 1-inch rough green lumber from which to make 13/16-inch dry surfaced lumber. Another producer with different equipment might have to set much thicker to arrive at a comparable end product.

Thickness standards of boards and dimension are discussed because these are basic to the cost and the uses of most construction lumber.

Early Standards

Until the middle of the 19th Century, building lumber was usually produced in a locality close to the place where it was to be used. Sizes were not a problem. The needs of builders in the locality were well understood and carpenters were accustomed to much more hand fitting on the job than they are today. As the forests were cut back from the centers of population, lumber had to be shipped greater distances. By the last few decades before 1900, lumber was no longer a locally made commodity. It then became apparent that the sizes used in different trading areas were not uniform and as a result sawmills had to cut lumber for the markets they wished to serve.

The lumber taken from old houses is revealing in its variety. By 1900, 2 inches was the most common thickness for joists, rafters, studs, and the like, and 1 inch for boards. At first, little difficulty was experienced with the varying size standards because the sawmills of a region sold their lumber, for the most part, in certain trade areas. However, as rail shipment of lumber increased during the last half of the 19th Century, lumber from distant regions began to move into trade areas that had been served previously by the local region. Differing manufacturing standards then became important, For rough lumber, the size variations were not great, but for surfaced lumber it was a different story.

Rough lumber has the disadvantage of varying in thickness and width. Therefore, before the advent of mill surfacing, boards were planed by hand or in local planing mills when a uniform thickness or a finished surface was needed. Dimension was fitted into place by the carpenter, more often than not with his hatchet. Some enterprising sawmills started the practice of bringing dimension lumber to a uniform width by passing each piece through a small edger or rip saw before shipping. This was known as saw sizing and the width was usually 1/4-inch scant of the nominal width. Sawmills began to use planers sometime after 1870 and these

machines provided an additional means of making rough lumber more uniform. This was really not a finishing operation. It was a sizingprocedure. Boards were commonly surfaced one side (S1S), sometimes S2S. Dimensionwas worked S1S1E. Lumber surfaced on four sides (S4S) could be had at additional charge. This custom of preparing lumber for sale persisted in some regions for many years. Even as late as the 1920's some big mills based their prices on rough or saw-sized dimension, boards S1S, and made an additional charge of $1 per thousand for lumber S2S, S1S1E, or S4S.

When surfacing at the mill became common practice, it was readily apparent that the reduction in weight meant a saving in freight charges. Therefore it was possible to get into highly competitive markets that could not be attained with rough lumber because of its greater weight. Writing on the subject in August 9, 1919, issue of the American Lumberman, the editor said:

> Scant allowance was originally to allow for seasoning and came about gradually as the rail movement of lumber increased. Here very material freight savings came into the picture. Most of the evolution toward nominal sizes seems to have occurred during the period of introduction of southern yellow pine into the North and was defended on the basis that southern yellow pine was stronger than northern white pine scantling.

Persons who think in terms of present prices and motor truck transportation may wonder at the effect of rail freight on competitive selling prices. To bring the matter into the proper perspective we should recall that costs, prices, salaries, and the like, were far different in 1900 than they are now. Although there were great fluctuations in demand and prices between 1880 and 1920, during this period a great deal of lumber was sold f.o.b. mill at a price considerably lower than the freight cost to deliver it. Some f.o.b. mill prices fell below $10 per thousand board feet, and freight was often more than $20 per thousand. Sales costs were lower, too. Under the circumstances, the stage was all set for sizes to be reduced as much as market conditions would permit.

The lumber manufacturers associations generally adopted size standards for the lumber manufactured by their members. Some of these early size standards follow:

(1) North Carolina Pine Association Grading Rules revised to April 1, 1906:

> All lumber shall be well manufactured and well dried. One-eighth inch shall be allowed to dress 4-4, 5-4, 6-4, and 8-4 lumber one side. Three-sixteenth inch shall be allowed to dress 4-4 and 5-4 lumber two sides. One-fourth inch shall be allowed to dress 6-4 and thicker lumber two sides.

The rules include nothing about edge dressing except for matched lumber which was specified to 1/2 inch scant of nominal.

(2) Pacific Coast Lumber Manufacturers Association Standard Dimensions and Grading Rules for Export Trade, copyright 1902:

> Sizes 4 inches and under in thickness or 6 inches and under in width will be worked 1/8 inch less for each side or edge surfaced.
> Sizes over 4 inches in thickness or over 6 inches in width will be worked 1/4 inch less for each side surfaced.
> Tongued and grooved, surfaced one side, will be worked 1/8 inch less in thickness; 5/8 inch narrower on face.

> Above references being to "Green" lumber, the worked sizes if of partially or wholly seasoned lumber, will be proportionately less, as determined by the shrinkage.

The grading rules of PCLMA covering rail shipments, adopted March 30, 1906, do not include definitions of standard sizes.

(3) Southern Cypress Manufacturers Association Grading Rules adopted July 18, 1906:

4/4 lumber S1S or S2S shall be 13/16 inch thick.
8/4 lumber S1S or S2S shall be 1–3/4 inches thick
All lumber S1E takes off 3/8 inch, S2E 1/2 inch.

(4) Yellow Pine Manufacturers Association Grading Rules adopted January 24, 1906:

> Sizes of Boards 1 inch S1S or S2S to 13/16 inch. Sizes. Dimension shall be worked to the following: 2 x 4 S1S1E to 1–5/8 x 3–5/8 inches; 2 x 6 S1S1E to 1–5/8 x 5–5/8 inches; 2 x 8 S1S1E to 1–5/8 x 7–1/2 inches; 2 x 10 S1S1E to 1–5/8 x 9–1/2; 2 x 12 S1S1E to 1–5/8 x 11–1/2 inches. Dimension S4S 1/8 inch less than standard size S1S1E.
>
> Rough–Common Boards and Fencing must be well manufactured, and should not be less than 7/8 inch when dry.
>
> Rough 2–inch Common shall be well manufactured and not less than 1–7/8 inches thick when green, or 1–3/4 inches thickwhen dry. The several widths must not be less than 1/8 inch over the standard dressing width for such stock.

A later listing of standard sizes was included in Kellogg's "Lumber and Its Uses," dated 1914 (3)[3] (see Appendix A).

These early efforts by the associations to standardize lumber sizes, while generally helpful, emphasized the differences in manufacturing practice between regions. Then too, much lumber was sold without reference to association rules or standards. Consequently, so far as the retail purchaser was concerned, lumber sizes were mostly an unknown quantity. The situation, if anything, became more confused as a result of the shortages and controls brought on by the First World War and the subsequent seller's market that ran on through 1919. In connection with an article on sawmill operation, a contributor to the American Lumberman of July 6, 1918, had the following to say about sizes:

> There are several standards of thickness in different parts of the country but most mills cut the great bulk of their lumber for some certain market where the standard for dressed lumber is well established and where anything thinner will not be accepted except at a lower price, and in some cases will not be accepted at any price. One would naturally expect to find the thickness of all lumber intended for the same market practically the same, but as a matter of fact the reverse is true and there is considerable variation in the thickness of lumber at different mills that sell in the same market.

The author went on to recommend a standard product based on a rough green board measuring 32/32 inch.

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[3] Underlined numbers in parentheses refer to Literature Cited at end of report.

National Standardization

After World War I stopped in the fall of 1918, the pent-up demand for construction resulted in an ever-increasing demand for lumber continuing all through 1919. When placing orders, the emphasis was on shipments and not on details of specifications and price. Retail dealers were not entirely happy with conditions, and demands for better standardization among associations were heard. At a manufacturers meeting in March 1919, JohnLloyd a Philadelphia retailer, pointed to a need for standardization; in July 1919, H. J. Meyers, President of the Pennsylvania Lumbermen's Association, spoke of standard sizes at an Association meeting and got support for fixed standards like weights and measures. At this meeting the recommendations were for 13/16-inch S2S boards with edges not more than 1/4 inch scant of the nominal width.

Probably because of the apparent growing need for more uniform lumber, this subject was included in the agenda of the American Lumber Congress, which met in April 1919. Among the resolutions adopted at the Congress was one dealing with uniformity of lumber and moldings, and a committee was formed to consider the entire field of lumber standardization. This committee met on June 30 and came to the conclusion that standardization was needed in sizes, grades, nomenclature, forms, and moldings. A resolution was adopted asking the National Lumber Manufacturers Association to investigate and submit its findings to retailers and manufacturers.

For some years the U. S. Forest Products Laboratory had studied comparative grades and manufacturing practice in the. several lumber-producing regions of the United States. Consequently, the advice of the Laboratory was sought by the NLMA and recommendations were made. Briefly, the Laboratory found that more than 60 percent of the surfaced boards produced in the United States were 13/16 inch thick air dry and that more than 60 percent of the dimension was surfaced to an air-dry thickness of 1-5/8 inches. These basic sizes were recommended and on March 18,1920, were adopted by the Southern Pine Association and on March 31 by the North Carolina Pine Association.

The Forest Products Laboratory studies resulted in the publication of "Standard Grading Specifications for Yard Lumber," in 1923 as Circular 296 of the Department of Agriculture (2). The foreword to that publication indicated the four main divisions of the field of lumber standardization as (1) hardwood lumber, (2) softwood factory lumber, (3) structural timbers, and (4) yard lumber. Circular 296 dealt with yard lumber and a companion, Circular 295, "Basic Grading Rules and Working Stresses for Structural Timbers," dealt with structural lumber (4).

In preparing Circular 296, the Laboratory made field studies at 75 sawmills and gave extended consideration to the most economical thickness of lumber for both producers and consumers. They concluded that 13/16 inch was the most suitable thickness for 1-inch boards surfaced on two sides when seasoned to the proper moisture content for the use intended. They similarly recommended 1-5/8 inches for the thickness of dressed 2-inch dimension. They reported that the following allowances for drying and surfacing a 1-inch board are reasonable: variation in sawing 1/16 inch; seasoning (air-dry, 15 percent range), 1/32 inch; surfacing, 3/32 inch. Circular 295 did not discuss standard sizes.

It is worth noting that so far standard sizes had been premised on dry lumber. The term "shipping dry" was often used in connection with shipping weights. This term, while not precisely defined at the time, since there were no moisture meters then, was generally understood to mean air-dry intherange of what is now defined as 15 to 20 percent moisture content.

The beginning of national standardization of lumber size and grading dates from 1921. Early in that year a group of leading lumber manufacturers paid a visit to the Secretary of Commerce, Herbert Hoover, a noted engineer. Mr. Hoover was actively interested in products standardization and the simplification of standards in many fields through the work of the Bureau of Standards. Included in the group meeting with Mr. Hoover were John H. Kirby of Houston, John W. Blodgett of Grand Rapids, and Edward Hines of Chicago, all prominent in the National Lumber Manufacturers Association. This group of lumbermen proposed a simplification of both lumber size and grading standards and publication by the Bureau of Standards, supplemented by grade marking under the auspices of the various lumber manufacturers' associations. The original proposals included softwoods only and yard grades only. Consideration of hardwood standards was not involved except to the extent of hardwood interest in so-called yard lumber. The initial approach to Mr. Hoover had an interested and enthusiastic response.

All through 1921 various groups of lumber manufacturers, wholesalers, and retail dealers considered size standards for lumber. Numerous meetings were held. Appendix B gives recommendations from one such meeting in October 1921.

Meanwhile, the opening of the Panama Canal in 1914 had provided a means for the intercoastal shipment of heavy, bulky goods such as lumber at a considerable freight saving. This is important to a discussion of lumber standardization because ocean rates are based on volume rather than weight. Consequently, the moisture content of lumber had no bearing on freight charges but size did. The shipment ofgreenlumber from the West Coast to Eastern ports was facilitated. At first only a few cargoes of lumber went through the Canal but after the war, beginning about 1920, the traffic began in earnest. The Weyerhaeuser Company, A. C. Dutton, and others handling western lumber built large terminals on the East Coast. Weyerhaeuser's big Baltimore terminal received its first multimillion foot shipment about the end of 1921 or early in January 1922. Very few boards were shipped. Quite a bit of the 2-inch green dimension was S4S, 1/4 inch scant to allow for subsequent shrinkage.

Standardization continued to be a live topic of discussion among lumbermen. The American Lumberman for January 29, 1922, reported an address by Samuel Roberts of Norristown, Pa., at a meeting of the Pennsylvania Lumbermen's Association in part as follows:

> During the last 4 or 5 years the irregularity in the sizes of rough and dressed lumber has become very pronounced, and if there is not a very definite and positive stand taken by the retailers, there is no telling where it will extend. One of the many reasons that has produced this thin and narrow lumber that we are afflicted with today is the keen competition between the manfacturers having the long haul and the short haul on the railroads. This has caused the manufacturer with the long haul to try to meet his competititor's price by putting on the market thinner lumber, thereby equalizing the difference in the freight rates.

Roberts observed that retailers share the blame and to illustrate his points showed how the Philadelphia Building Code had been changed over the years from 3 by 9 rough for ordinary joists to 2 by 10 and 1–3/4 by 10 rough and then to 1–5/8 by 9–1/2. The change was brought on by the retailers. The meeting then recommended some standard sizes as:

> Rough, not more than 1/8 inch scant of nominal dimension; surfaced boards, 13/16 inch thick and 3/8 inch scant in width; surfaced dimension, 1/4 inch scant in thickness and 3/8 inch scant in width

For some time the western shippers had field men traveling in the eastern markets promoting western lumber. At a West Coast Lumbermen's Association meeting in February 1922, reported in the American Lumberman for February 25, 1922, one of the field men, C. J. Hogue, reported as follows, "The West Coast standard of size and practice of dressing green from the saw is beginning to take." However, he reported an insistent demand for full–size stock seasoned before dressing. He said further that the eastern retailer handling West Coast standard lumber had the practice and prejudice of years to overcome.

Apparently there had been talk of the Federal Government entering the field of lumber standards because Mr. Hogue continued, "Government regulation cannot say what size a man will cut his lumber but it can say how much of a spread there shall be between the actual size and the nominal size and this is inevitably what will happen unless lumbermen can agree on satisfactory standards among themselves to satisfy the ultimate customer that he is getting what he pays for."

Another field man, C. G. Garner, recommended the abolishment of dressing green, the standardization of sizes, and said that the manufacturers should stand the shrinkage.

This meeting was attended by a group of retailers from the Northeastern Retail Lumber Dealer's Association who were traveling in the West. One of these dealers, Mr. K. B. Schotte of Amsterdam, N.Y., criticized green dressing and scant sizes and replying to him Mr. W. M. Boner of the Weyerhaeuser Co. said, "The trade wants this change (dry size standard) but they won't pay for it. We have never been encouraged to get away from scant sizes. I'll say this: This thing of surfacing green is wrong. But there is a question in my mind whether you would buy it (dry). I'm willing to reform if we've got a market for it."

The American Lumber Congress met early in April 1922. Among the actions of the Congress was a recommendation that the West Coast Lumber Manufacturers Association and the Southern Pine Association agree on standardization so that national standards could be established. On April 4, Secretary of Commerce Hoover spoke of the activities of his department in the field of standardization and strongly encouraged continuing interest and activity on the part of the lumber industry.

The next day the meeting passed a resolution to the effect that a committee appointed by the National Lumber Manufacturers Association confer with Mr. Hoover about standards and related matters. Later the meeting was set for 4 days beginning on May 22.

Most of the various lumber groups, manufacturers, wholesalers, and retailers prepared statements of their view in preparation for the May meetings. For example, the wholesalers formulated a recommendation which may be summarized as follows:

A. Standard grading rules.
B. Uniform grade branding.
C. Car cards.
D. National inspection bureau to be created by Congress to function under the Department of Commerce or the Forest Service.
E. Control of standards under the Federal Trade Commission to prevent misbranding.
F. Compulsory arbitration of disputes.

A delegation of wholesalers presented these recommendations to Mr. Hoover and reported that he was kindly disposed to the suggestion that a national inspection bureau be created but that he was inclined to believe that inspection could be taken care of within the industry.

Just a few days before the standardization meeting, the West Coast Lumbermen approved a program of size standardization and tally cards. The details are not available.

The American Lumberman for May 27, 1922, reported on the conference with Mr. Hoover during which he had urged the formation of a national inspection bureau within the industry. The next week a good start toward standardization was reported. Specifically mentioned was agreement between manufacturers and retailers on patterns and sizes of flooring, ceilings, partition, and drop siding. Arrangements were made for further regional conferences.

So far the details of only softwoodlumber standards had been considered. Now some thought was given to hardwood standards. These were uniform throughout the country and were administered by one agency so there was no apparent need for consideration of hardwood grades and manufacturing standards. However, it was reported on June 24 that the Hardwood Manufacturers Institute endorsed the standardization program.

One can infer from reading the trade journals, like the American Lumberman, of mid-1922 that a demand for some sort of government supervision of lumber grades and standards continued and that among lumbermen opposition to government standardization had developed. Perhaps for this reason editorials in the July 15 and July 29 American Lumberman asked for the hearty support of and cooperation of the lumber industry with the program of the Department of Commerce. Dr. Wilson Compton of the National Lumber Manufacturers Association issued a statement to the effect that a constructive program of standardization of industry would bury public agitation for government regulation.

About this time lumber representatives met in what were called standardization meetings in Madison, Wis.; Chicago, Ill.; and Portland, Oreg. The meeting in Madison centered around the basic grades proposed by the Forest Products Laboratory. The meeting in Chicago had to do with sizes as well as grades. The retailers continued to favor a 13/16-inch board. There was some discussion about 13/16 inchwithaplus or minus tolerance of 1/16 inch based on the belief of some that lumber could not be made closer than 1/16 inch to a stipulated size. This idea never got very far. However, the meeting did result in a table of recommended size standards, in part as follows:

	Manufacturers	Retailers
Boards*	13/16-inch thickness by 3/8 inch off in widths to 7 inches; 1/2 inch off in widths of 8 inches and wider.	13/16-inch thickness by 3/8 inch off in widths to 8 inches; widths of 10 and 12 inches, 1/2 inch off.
Dimension	1-5/8-inch thickness by 3/8 inch off in widths to 6 inches; widths of 8, 10, and 12 inches, 1/2 inch off.	No recommendation

*The American Lumberman for July 29 reported that the following associations voted No.: Northern Pine Association, West Coast Lumber Manufacturers Association, and Western Pine Association.

So far as can be ascertained, the Portland meeting was inconclusive.

During the rest of the summer discussions and trade journal editorials on standardization continued. The August 12 American Lumberman contained an article by Mr. William A. Babbitt, at that time manager of the National Association of Wood Turners, which took issue with the universally held view that standard sizes for lumber should be related to an inch. Mr. Babbitt compared the discussion of board thickness to the Schoolmen's discussions of the Middle Ages about the number of angels that could dance on the head of a pin. His contention was that the thickness of a board is related to conservation and the heart of the matter was utility.

The simple fact is that the customs andprecedents of the lumber industry were so wedded to "measurement" rather than 'utility" that Mr. Babbitt's ideas did not make much headway. This matter will be discussed in greater detail later.

Late in September 1922 a group of 35 delegates representing 12 eastern lumber associations met in New York City to discuss lumber sizes. At this meeting the group favored "giving the customer 16 ounces per pound," and passed a resolution regarding lumber sizes in part as follows:

> Rough 2-inch dimension shall be full width and thickness allowing 1/8 inch in 10 percent of the shipment for imperfect manufacture or uneven drying. Rough boards shall be full except for 1/16 inch scant in 10 percent as above. Dressed dimension shall be not less than 1/4 inchscant when dry. Dressed boards, 13/16 inch by 1/4 inch scant in width when dry. Recommendations were also made on flooring and timbers.

It may be noted that all eastern recommendations were based on dry lumber. Now questions were asked about the meaning of "dry," "shipping dry," and like terms. In its studies of shrinkage, the Forest Products Laboratory had used 15 percent as a moisture content to which to relate the dry size of lumber. The term "shipping dry" was often used. This was defined in the October 7 American Lumberman as "ready to use, will not deteriorate in storage." Actually there was not much argument about the term "dry." At that time the lumber industry as well as the construction industry all the way down to the carpenter (and despite the green lumber of wartime years) were accustomed to thinking of dry lumber. The definition quoted above had a real meaning.

Development of 1924 American Lumber Standards

The foregoing discussions and conferences led to the formation of a central committee thereafter known as the Central Committee on Lumber Standards. Its chairman was John W. Blodgett, President of the National Lumber Manufacturers Association. Its membership included producers, wholesale and retail distributors of lumber, and consumers of lumber. The first formal meeting of the Central Committee was held on October 3, 1922, and the respective representatives of the manufacturers, wholesalers, and retailers had an opportunity to meet and get acquainted with their opposite numbers representing the wood-using industries, the architects, engineers, railroads, and general contractors.

The Central Committee established early in December what was subsequently known as the Consulting Committee on Lumber Standards. It was composed largely of technical men representing the same interests of production, distribution, and use of lumber and timber. The chairman of the consulting committee was Dr. Wilson Compton, then General Manager of the NLMA. It held a number of meetings whichwere well attended. Great interest was shown by all parties concerned, largely prompted by the interest manifested by the Secretary of Commerce and the help of the U. S. Forest Service.

Progress became more rapid. The program and plans of procedures were presented to a meeting of retailers, engineers, and architects by William A. Durgin, Chief, Division of Simplified Practice, Department of Commerce, and on October 16, 1922, the Central Committee published a statement of progress. Dimensionandboards were proposed to be 1-5/8 and 25/32 inches thick dry. The resolutions of May 22 to 26 conferences were reaffirmed and general definitions and nomenclature were mentioned. The origin of 25/32 inch as the thickness of a 1-inch board is discussed also in Appendix C. Actually the proposal was not exactly satisfactory to anyone and was the cause of some criticism. Probably because of this, an editorial in the November 4 American Lumberman was based on the theme that standardization advantages involve concessions. Apparently those concerned did not like the word "compromise;" at any rate, in an address, Mr. Durgin referred to 25/32 inch as a "practical mutual concession." Whatever it is called, the principles involved in the compromise resulted only in future controversy.

Charles Hill of the Southern Pine Sales Corporation, operating in North Carolina pine, was quite dissatisfied. A strong statement from him about standard sizes and the measurement of scant sizes was quoted in the American Lumberman for December 23, 1922. He contended that price competition lowered lumber standards and to illustrate pointed to a weight reduction of 200 pounds per thousand for each 1/16-inch reduction in thickness. At 1922 rates, this meant a rail freight saving as follows:

Norfolk to New York	$0.60
Deep South to New York	1.10
West Coast to New York	1.80

Undoubtedly the difference of $1.20 between Norfolk and West Coast freight influenced Mr. Hill's thinking.

The various organizations that were concerned with lumber standardization continued their work during 1923. On February 5, the consulting committee met to discuss the standard thickness of boards. Both the western and southern producers expressed a willingness to agree on 25/32 inch as the finished thickness of boards. The North Carolina pine group held out for 13/16 inch. There was discussion of the basis from which to compute finished thicknesses, and the committee agreed on rough green lumber as the starting point. The architects favored utility as the basis to determine thickness and recommended appropriate studies. There was a lack of agreement on widths. The retailers wanted finished widths to be 1/4 inch scant. Manufacturers favored 3/8 to 1/2 inch scant.

There was also discussion of standard 2-inch sizes. With the exception of the North Carolina group, the manufacturers wanted 3/8 inch scant. The retailers favored 1/4 inch scant.

On February 24, 1923, George Gerlinger, who represented the West Coast Association on the consulting committee, reported to his principals on the February 5 meeting. The American Lumberman for March 3 quotes him as stating that there was a tendency toward using rough green with an allowance for sawing variation as the basis for sizes.

The matter of a basic thickness of lumber was a major problem in developing a standard. Mr. R. G. Merritt, Secretary of the Central Committee, explained in the March 10 American Lumberman why 1-inch rough green was taken as the base, in order to answer critics who favored 1-inch rough dry. It was generally agreed that the final finished thickness should include an allowance for surfacing commercially dry stock. An editorial in the next issue of American Lumberman had to do with the NLMA agreement on 25/32 inch and 1-5/8 inches as standard thicknesses. It pointed out that these agreed thicknesses provided for surfacing and shrinkage from rough green thicknesses of 1 inch and 2 inches.

The box manufacturers contended that although they would go along with 25/32, actually 13/16 inch was used in most softwood boxes. They were supported in this by J. A. Newlin of the Forest Products Laboratory. This led to a proposal of two thicknesses of 1-inch boards, which was made in the report of a subsequent joint meeting of the consulting committee and the manufacturers' standardization committee. The proposal resulted in a compromise, with 25/32 inch known as the "standard" board and 13/16 inch included as "extra standard." The term 'extra standard" became in later years "industrial standard."

Another problem had to do with board measure. It was emphasized during the discussions that the board foot is used to measure logs and standing trees. Consequently, it applied in the green condition. Forest Service statistics were based on nominal rough green dimensions. Any volume lost in shrinkage due to drying and in surfacing thus did not represent a change in measurement but only a refinement of the original rough green lumber. The board measurement of lumber less than 1 inch thick (rough green) was based on the surface dimensions of length and width. Appendix D is a detailed statement prepared for the Consulting Committee on the green rough dimension and board foot measurement.

There was much discussion also of the matter of "dryness or seasoning." The closest approach to unanimity that could be reached was the term 'shipping dry." It was decided to leave definition of the term to the regional associations with the understanding that weights to determine dryness and thickness would be issued after approval by the Central Committee. This leaving of the matter to later education and compromise had over a period of years a very substantial effect, as differing ideas of "shipping dry" developed in different regions.

All these discussions led to much controversy among lumber groups. One hardwood group, which was not directly affected by the softwood standard, got into the act, thereby making it necessary for Herbert Hoover to deny allegations that politics influenced standardization. This was reported in the June 23 American Lumberman.

On July 25 and 26, the Board of Directors of the NLMA met in San Francisco. Reports were made on the status of the work on standardization. In connection with a discussion of standard sizes, Wilson Compton explained, "There is nothing to prohibit any consumer from demanding or any manufacturer from cutting thicker lumber, but it simply means that the lumber trade as a whole asserts that there is a minimum below which it will not go and that anything below that is not standard." The quotation is from the American Lumberman for August 4.

The Pennsylvania Lumberman's Association met in Williamsport, Pa, on July 30, 1923. They were not at. all satisfied with the proposed standard sizes and went on record as disagreeing with a statement made by Mr. Durgin of the Department of Commerce to the effect that retailers demanded smaller sizes. They proposed to "buck the efforts to put across scant sizes."

The August 25 American Lumberman reported that on the 18th the West Coast Lumbermen's Association approved the standardization work.

Early in October, John E. Lloyd, a member of the Central Committee, President of the National Retail Lumber Dealers' Association, at its annual convention urged the adoption of the proposed standards even if not agreeable to everyone. He said that any standard would do if it is a standard and he pointed out that they were working for a minimum standard which would prevent the selling of still thinner and narrower stock. He suggested that the proposed standard be tried for a year and then if not satisfactory, it could be changed.

On November 6, 1923, the Department of Commerce announced that the first standard was complete. Mr Hoover called a meeting for December 12 for its ratification. During the week of November 20 the Forest Service announced that in the interest of standardization it would support the recommendations of the Central Committee even though its position had been for the 13/16-inch board.

Appendix C explains in detail the provisions of the proposed American Lumber Standards. It may be well to emphasize that it was the view of the Central Committee that finished dry sizes are the only sizes that are physically capable of standardization within the prescribed limits of 1/32 inch.

The American Lumberman for December 15 carried an editorial about the agreement on the standards and also a discussion of its approval.

It will be recalled that one of the early objectives was the organization of a national lumber inspection service. This was found to be impracticable and in fact never has been accomplished.

Despite the approval of the standards on December 13, there remained a number of less controversial loose ends to tie together before the effective date of July 1, 1924. This was accomplished during the early months of the year. For example, the manufacturers standardization committee and the consulting committee met during January to work out some of the details of random lengths and odd lengths. There was an extended discussion of rough dry thicknesses and the Forest Service was asked to prepared a table showing for each species shipping weights for specific rough dry sizes. It is to be noted that size limitations for rough green lumber were never included in the standards. The record is not clear as to reasons, but variations in mill manufacturing practice had a lot to do with it.

Further, no attempt was made to list standard sizes for surfaced, green lumber. All standard sizes were stated as minimum dimensions of dry lumber. In this way much controversy was avoided. When surfaced green lumber is purchased it is, of course, entirely possible to stipulate the minimum acceptable green size. However, the shrinkage of lumber is a variable and the difference between a stipulated green size and a standard dry size is unlikely to be the actual shrinkage in any specific instance. If so interpreted, needless and inconclusive argument can result unless the green and dry sizes are recognized as "technical equivalents" and some variation of individual pieces is understood.

The consulting committee and the Central Committee met in March and acted on the proposals made earlier on odd and short lengths, bundling, and grade marking. On April 22 a conference of producers, distributors, and consumers met in Washington and recommended the adoption of the supplementary material. Late in May the Central Committee announced that it had copyrighted a trademark for the use of mills that agree to produce American Standard lumber.

In the meanwhile, various associations of manufacturers and retailers had acted to endorse the standards. It is interesting to note that the North Carolina Pine Association and some retail groups qualified their endorsements as applying to extra-standard lumber only.

The standards, Simplified Practice Recommendation No. 16, became effective July 1, 1924, and were the subject of an editorial in the July 5 American Lumberman. In announcing the effective standard, Secretary Hoover said in part, "...it is proof of industrial conscience and service;" and "If this effort succeeds, no legislation will be necessary. This is keeping the Government out of business through the remedying of abuses by business itself."

Later, during the campaign for the presidency in 1928, Mr. Hoover referred to the lumber industry and its standardization movement as "Exhibit A of industrial self-government."

On July 23, 1924, the NLMA announced the establishment of a lumber standards bureau under A. T. Upson, formerly of the Forest Service, to promote uniformity of grading and inspection under the American Lumber Standards. Extracts from SPR 16 dealing with the events leading up to its adoption are given in Appendix E.

The Period 1924–1939

No sooner had the standards become effective than questions and misunderstandings began to arise. To illustrate, the July 26 American Lumberman printed a summary of the provisions of ALS prepared by the Central Committee. Included therein was a discussion of commercially dry shipping weights. It was stated that the Forest Products Laboratory was to prepare a schedule of commercially dry weights for each size of standard and extra–standard lumber. When approved, these were to become apart of ALS. The Central Committee went on to explain that so far as ALS was concerned, shipping weights had no bearing other than for use in determining standard sizes. They had nothing to do with freight charges.

The September 13, 1924, issue of the American Lumberman printed an exchange of correspondence between the National Retail Lumber Dealers Association and the Southern Pine Association about standard (25/32) and extra–standard (13/16) boards. Apparently there was retail dissatisfaction with the mill policy to produce 25/32. The Southern Pine Association contended that a survey showed that retailers wanted 25/32 more than 2 to 1. The retail position was that Secretary Hoover had assured them that 13/16 would be available to those who wanted it, while in fact it was not.

Although retailers had expressed a lack of enthusiasm for the new standards, the manufacturers in general had gone along with them. In some areas like the Northeast and the Lake States, local producers continued to serve their trade with the accustomed sizes. Many West Coast producers, however, were dissatisfied. On October 18, 1924, a meeting was held in Aberdeen, Wash., to discuss the standards. On the advice of a telegram dated October 14 from H. G. Uhl, Secretary of the Central Committee, stating that CCLS approved green dressing of fir lumber, it was decided to dress green. A change in paragraph 27 of the WCLA Grading Rules was noted so that this paragraph would read, "Dimension, 2 x 4 and wider, timbers, and all lumber thicker than 2 inches, if ordered surfaced, are surfaced green to standard size.'

The meeting rejected the wording of the paragraph which had been adopted at Hoquiam, Wash., meeting on June 28 reading as follows:

> Common grades of boards and dimension up to and including 2 x 12 inches may be surfaced green or dry. If surfaced green, they shall be accepted by the purchaser, if, upon receipt of the shipment, the sizes are within 4 percent of the standard size. Dimension, 2 x 4 and wider, timbers, and all lumber thicker than 2 inches, if ordered surfaced, are surfaced green to standard size.

A table of shipping weights was also adopted. The meeting was reported in the October 25 issue of the American Lumberman.

In the discussion concerning this action, Mr. A. C. Dixon of the Booth–Kelly Lumber Co. of Eugene spoke of the 4 percent allowance. It was made plain that this allowance was intended to be a plus allowance to compensate for shrinkage. Others present at the meeting said that when lumber was shipped green it should be of sufficient size that when dry it would be of the right size.

The action of the Aberdeen meeting apparently had been dominated by the cargo mills and did not meet with universal approval; another meeting was therefore held at Tacoma on November 8, 1924. Many of those present felt that lumber when dressed green should be full in thickness to allow for shrinkage. The Aberdeen action on rule 27 was rescinded and the working of the Hoquiam recommendation was reinstated. The American Lumberman reports "spirited discussion," and that is probably an understatement.

Still another meeting was held at Tacoma on November 15. The cargo mills opposed full-size standards in favor of green standards. However, the meeting reaffirmed the action of November 8.

The southern mills, too, were having trouble. At a Southern Pine Association meeting at Memphis on November 10, Mr. W. T. Murray of Rochelle, La., of the rules committee reported that his firm made 13/16 to order at a price differential. He said that the biggest fight was to refuse to ship 3/4 to some retailers who demanded it to meet competition. Strangely enough, the official position of the retail associations still was for 13/16. The southern pine manufacturers decided to give the standards a full year's tryout.

The standards were revised and expanded in 1924 and again in 1925 (effective dates July 1, 1925, and July 1, 1926). No changes were made affecting standard sizes. However, extra-standard boards and dimension were renamed "industrial standard." Appendix F, excerpted from a 1926 trade journal article, refers to this.

In 1928 an important change with respect to moisture content definitions and the basis for the measurement of sizes was suggested. These are discussed in Appendix G, a portion of the proposed 1928 revisions to American Lumber Standards.

Ever since the effective date of the 1924 standards, it had been apparent that the weight of a shipment was not a good criterion of the size or moisture content of the lumber. There were too many variables. Then, too, standard shippingweights were associated with freight charges, which was a further complication. Therefore, as soon as a means of determining moisture content was reported available, appropriate changes in the standards were suggested.

At a meetingofthe CCLS on December 7, 1928, these matters were discussed. The proposals made by the consulting committee set forth in Appendix G were rejected, and references to "shipping dry" were taken out of the standards. These references were replaced in the 1929 standards by:

> Paragraph 28. The dressed dimensions, specified in paragraphs 30, 31, 32, 33, and 46 and the roughsizes specified in paragraphs 34 to 36, inclusive, shall apply to lumber in the condition of seasoning as sold and shipped.
>
> Paragraph 27. Specifications dealing with lumber seasoning and moisture content shall be developed by each regional manufacturers' association in accordance with its own conditions and the requirements of the users of its products. Such specifications adopted from time to time by any regional association shall be filed with the Central Committee on Lumber Standards for approval.

The basic motion to effect this change was made by George D. Rose representing the line yard dealers. It was seconded by W. R. McMillan of the California Redwood Association. The minutes of the Central Committee do not give the details of the voting.

Although new paragraphs 27 and 28 reduced the effectiveness of size standardization, they were not immediately used. In 1929, business conditions were not good. For the next 10 years, lumber had to be sold in a buyer's market. Dry, full-sized, well-graded lumber was readily available. During this period large quantities of West Coast Dimension surfaced green 1/4 inch scant continued to be shipped in the Intercoastal trade. The full size of this lumber compensated fairly well for shrinkage. West Coast boards were not a factor in the eastern market.

The 1929 standards were supplemented but stood without important change for 10 years. With the improvement of business conditions in the late 1930's, the need for review was recognized, and the Central Committee on Lumber Standards met on December 14 and 15, 1937. Proposals developed at that meeting were somewhat modified to accord with suggestions received from the lumber industry, and the modified standardwas promulgated as of October 15, 1939, under the title "American Lumber Standards for Softwood Lumber: Simplified Practice Recommendation R 16-39." It was accepted by the major lumber manufacturers associations and by the National Lumber Manufacturers Association. It continued size standards for yard lumber and seasoning provisions without change from 1929.

During the same period, activity of the Forest Products Laboratory continued in the field of lumber grading. The Laboratory prepared "Guide to the Grading of Structural Timbers and the Determination of Working Stresses," published in 1934 as Department of Agriculture Miscellaneous Publication No. 185 (6). It included specific size recommendations for all of the structural sizes, including 2-inch joist and plank. Of these, it said

> Rough (unsurfaced) pieces shall be sawn full to nominal dimension except that occasional slight variation in sawing is permissible. At no part of the length shall any piece because of such variation be more than 3/16 inch under the nominal dimension when this is 3 to 7 inches, inclusive, nor more than 1/4 inch under the nominal dimensions when this is 8 inches or greater. The actual thickness of nominal 2-inch material shall not be less than 1-7/8 inches at any part of the length. Further, no shipment shall contain more than 20 percent of pieces of minimum dimension.
>
> Surfacing, whether on one or both of a pair of opposite faces, shall leave the finished size not more than 3/8 inch under the nominal dimension when this is 7 inches or less, and not more than 1/2 inch under the nominal dimensions when this is 8 inches or more.

MP 185 was incorporated by reference in R 16-39 as the basis for the grading of structural lumber. The American Society for Testing and Materials adopted similar provisions in their standards for structural grades of lumber. It was originally conceived that 2-inch dimension generally was not structural lumber, but growing emphasis on the engineering design of light-frame construction led to a1940 supplement to MP 185 that provided specifically for the stress rating of 2-inch framing lumber, Size recommendations remained unchanged. A suggested additional requirement was that "Material shall be seasoned to a moisture content of not to exceed 19 percent in any individual piece."

The Period 1939–1953

Beginning in 1940, the United States was preparing for or was actively at war for several years. There was feverish construction activity, and the diversion of steel to munitions put extra demands on lumber for construction. Even with the conservation of material made possible by a liberal wartime design basis, structural lumber was in short supply. Wartime price controls forced manufacturers to produce lumber as cheaply as possible. In many instances, the grade called for in design was unobtainable, and a lower grade was substituted. The good showing of wartime timber structures under these generally unfavorable circumstances led to a widespread belief that lumber had ample reserve qualities and that deviations from standards were not cause for alarm. Builders also gained a great deal of experience and confidence in coping with the consequences of building with green lumber.

Between 1939 and 1941 the lumber manufacturers associations came under the scrutiny of the Department of Justice regarding trade practices. To avoid charges of restraint of trade, the lumber manufacturers associations accepted consent decrees separating grading from their other functions and making the grading services available to nonmembers. At the time the consent decrees were being developed, extensive consideration was given to size standards and their relation to moisture content. Appendix H discusses this in some detail. The following was inserted in the 1953 edition of American Lumber Standards as a result of this activity:

> Approval of an agency's rules by the Board of Review should require that lumber identified as American Standard, whether shipped green or seasoned, which is to be used where accuracy of size is a prime consideration, shall meet American Standard sizes in its usual and customary markets.

The National Lumber Manufacturers Association reported to the lumber grading agencies that:

> The position of the Department of Justice will necessitate "First, that in grading rules published by any agency the definitions of seasoning and drying standards are to be clear and specific.
>
> "Second, that if lumber of sizes for which seasoning specifications are to be provided, is to be graded, marked, and sold as American Standard but is to be marked and shipped green, it must be finished oversize in both width and thickness by an amount to be shown in the grading rules approved by the Lumber Standards Authority as reasonably assuring that the lumber will be not less than the minimum standard dimensions when seasoned."

The Department of Justice has continued its interest in American Lumber Standards, as has been indicated in discussions of the present standards. It was agreed in a meeting of the principals in the lumber industry in December 1961 that a revision of ALS will require clearance from the "legal agencies responsible for such agreements" referring presumably to the Department of Justice.

A great deal of attention was given at the Forest Products Laboratory in 1946 to problems arising from the use of green lumber in building construction. Sharp controversy developed between the Laboratory and that portion of the lumber industry that customarily manufactured and shipped unseasoned lumber. The statement, since widely quoted, that "we still have not learned how to build good houses of unseasoned lumber" was made in a Laboratory report that was later withdrawn. An extensive "Program to Reduce Use of Green Lumber in Housing" was planned at the Laboratory, but never implemented. Although size standards were not a major part of the controversy, shrinkage in service was given as the principal drawback to the use of green construction lumber, thus emphasizing the relation of size to moisture content.

At about the same time was the case of the home owner in Virginia who sued for damages resulting from the use of green lumber in building his house. The court awarded him some $8,000 damages, but the award was set aside on appeal to a higher court. There was also sharp controversy about whether or not building codes could legally set maximum moisture content values in lumber used in buildingconstruction. The argument was advanced that health and safety do not require dry lumber, and that building law could not go beyond health and safety requirements.

While the consent decrees made it necessary to revise the 1939 American Lumber Standards, controversy on these items made the revision difficult. A revision was prepared in 1949, but there were serious objections from the West Coast Lumbermen's Association and the Pacific Lumber Inspection Bureau, and the 1949 revision was not promulgated. After much discussion, a further revised draft met general acceptance and was promulgated as Simplified Practice Recommendation 16–53. Grade standards were made more generalized. Size standards were continued as before, except that the standard dressed width of 6–inch lumber was reduced from 5–5/8 to 5–1/2 inches. Seven–inch boards were reduced from 6–5/8 to 6–1/2 inches. The moisture provision was "The shipping of green or dry lumber, of any item, is a matter for each agency to determine in accordance with its own conditions. Each agency should adopt its own definitions as to the green or seasoned condition of the lumber it ships. In considering its rules, the Board of Review should review these definitions and pass upon them as to clearness and adequacy."

ALS reiterated that "Lumber identified as American Standard, whether shipped green or seasoned, which is to be used where accuracy of size is a prime consideration, shall meet American Standard sizes in its usual and customary markets."

Changes were taking place in the relation of the Forest Products Laboratory to lumber grades. Its important role in the development of the first lumber standards has already been pointed out and reference was made to U.S. Department of Agriculture Circulars 295 and 296, which were prepared at the Laboratory. Six Laboratory representatives attended the Seventh General Lumber Conference in Washington in 1928. The U.S. Department of Agriculture was listed as an acceptor of R 16–39. Structural grades in American Lumber Standards were based on U.S. Department of Agriculture Miscellaneous Publication 185.

The years after World War II, however, saw a rapid increase in the industry control of lumber grades. The National Design Specification of the National Lumber Manufacturers Association has listed since 1944 the structural grades of lumber and their working stresses, while the 1955 Wood Handbook (5) referred to them in only general terms. In 1949, the American Society for Testing and Materials Committee D–7, with Laboratory personnel taking an important part, withdrew the descriptions of specific structural grades from their stress-

grading standard D 245–49T. While R 16–53 still refers to MP 185, it is with the exception that deviations therefrom shall be permitted if approved by the American Lumber Standards Committee. Laboratory staff did not participate in the conferences leading to the promulgation of R 16–53, nor was the Department of Agriculture an acceptor of that standard. The role of the Laboratory was conceived by that time to be that of an advisor only as called upon for help in technical questions.

Recent Developments

A proposal in 1956 to reduce the standarddressed thickness of the 1–inch board from 25/32 to 3/4 inch provoked a storm of controversy. Echoes of the 'Battle of the Thirty–Second Inch" are still being heard. The views of the Forest Service were sought by the Department of Commerce and by American Lumber Standards Committee. Replies to both requests prepared at the Forest Products Laboratory gave the factual data on equilibrium moisture content and shrinkage, and the reply to the Department of Commerce recommended that the 25/32–inch size be retained.

A sharp difference of viewpoint on lumber moisture content and size standards existed within the organized lumber industry. The southern pine industry favored the greater thickness of board and urged that it be tied to a maximum moisture content of 19 percent. The practice of a majority of western manufacturers was to dress and ship lumber green at ALS Standard sizes. They also advocated the 3/4–inch board. There were fundamental reasons for this difference in viewpoint.

Southern pine lumber is principally sapwood and has a high moisture content when cut. Unless dried immediately, the sapwoodis subject to bluestain. Southern pine lumber is cut mainly from trees less than 100 years old and is characterized by intergrown knots that generally do not fall out and cause degrade in drying.

Douglas–fir, on the other hand, is mostly heartwood at about 35 percent moisture content and does not suffer seriously from bluestain when shipped and stored unseasoned. The large old–growth trees are characterized by encased knots that fall out and cause serious degrade in drying. Further, Douglas–fir has less tendency than southern pine to warp in drying. All of these factors made green Douglas–fir more acceptable in the market than green southern pine, without a similar advantage when it was dried.

A meeting of American Lumber Standards Committee on April 30, 1956, voted to establish 3/4 inch as the standard dressed dry thickness (Appendix I), but when the proposal was circulated by the Department of Commerce, opposition by the southern pine industry and by retailers and users of lumber defeated it. Nevertheless, the West Coast lumber industry adopted the 3/4–inch thickness. In 1957, the southern pine producers sought to have the American Lumber Standards amended so that the standard dressed sizes would be associated with a specific moisture content. The proposal was defeated by a narrow margin and a strong protest against that action was made by the Southern Pine Inspection Bureau. Meanwhile, the Federal Housing Administration gave temporary acceptance to 3/4–inch boards (see Appendix J) and that acceptance is still in force. The 1958 Minimum Property Standards of FHA provided for reduced allowable joist and rafter spans where lumber was scant of the ALS sizes at 19 percent moisture content. Enforcement of that provision, however, has been incomplete.

Appendixes K, L, and M are reprints of trade journal articles about the 1956–1957 controversy. These illustrate the wide divergence of opinion within the industry.

Lumber size standards have international implications. Forty percent of the current Canadian lumber production is exported to the United States. The Canadian lumber industry tends to follow United States standards of size and grade so far as possible to make their product competitive. Canadian lumber, however, is exported also to Great Britain and other countries; it competes there with lumber of Scandinavian or Baltic origin which has generally larger standard sizes. Size standards for Canadian lumber were the subject of a 1961 meeting of representatives of forest products laboratories from Canada, United States, and Great Britain. The export trade of the United States lumber industry, however, is not large and size standards of lumber produced in other countries are not critical to United States producers.

Another development of recent years is the increase of engineering design of light-frame construction. The thickness of boards is thought of in engineering terms such as moment of inertia or modulus of elasticity or for its effect on nail-holding values. Dimension lumber used for framing is evaluated and allowable spans are set from working stress values reflecting strength and stiffness. Reference has already been made to the action of FHA in reducing joist and rafter spans by a specific percentage if lumber is undersize at a specified moisture content. Engineering dimensions have been added to arguments about size standards for construction lumber.

Board lumber competes directly in the housing market with sheet materials such as plywood, fiberboard, or particle board. The sheet materials, because of their homogeneity and their load-distributing characteristics, are generally permitted in less thickness than that required of boards. The lumber industry believes that boards thinner than those conforming to the present standard would compete more effectively with sheet materials. The choice, however, may be affected as much by comparative costs of application as by the cost or the structural properties of the materials.

A joint committee within the lumber industry was appointed in 1961 and has become active in the standardization field, Known as the Committee on Grade Simplification and Standardization, it has brought together representatives at the management level from all of the major regional lumber manufacturers agencies. Forest Products Laboratory representatives serve as advisors. Work has gone forward on the following:

(1) Reduction of the number of existing grades.
(2) Standardization of grade names and grade requirements for all species and grades.
(3) Development of uniform grade descriptions and grade-use data.
(4) Simplification of span tables through the grouping of grades and species having similar strength and stiffness characteristics.
(5) Establishment of standard dressed sizes for seasoned and unseasoned lumber. (This aspect of the program was included as a result of a request by the American Lumber Standards Committee that the lumber industry attempt to develop separate sizes for green and dry surfaced lumber.)

The Committee on Grade Simplification and Standardization has dealt mainly with boards and dimension lumber intended principally for light-frame construction. Its activities were first in connection with size standards, but later were on unified and simplified grade descriptions and on species and grade groupings for simplified joist and rafter spans. Grade descriptions and grade groupings are still not completely resolved, and a discussion of them is outside the scape of this history. Definitive action has been taken, however, on size standards.

Under SPR 16-53, it was possible to produce either green or dry lumber to the same standard dressed sizes. Producers of dry lumber urged that green lumber should be dressed to sizes larger by enough to compensate for the shrinkage in drying. Producers of green lumber naturally resisted such a change. An agreement was reached in 1961 that standard sizes would be related to moisture content, but that the new green sizes would be equivalent to SPR 16-53 sizes, while the new dry sizes would be smaller. This was justified by the argument that lumber dressed green to SPR 16-53 sizes had been widely and satisfactorily used, and that requirement of larger green sizes would be wasteful and would work undue hardship on the lumber industry.

The southern pine industry first proposed that both thickness and width of 2-inch dimension be reduced from the older sizes by an amount commensurate with the expected shrinkage, about 1/32 inch per inch. The western industry countered with the proposal that standard widths be left unchanged and that the standarddrythickness be reduced from 1-5/8 to 1-1/2 inches. They pointed out that joists or rafters thus sized dry would have as much load capacity as joists or rafters dressed green to the older sizes and subsequently shrunk in drying to the same moisture content. This was true because width is more critical than thickness in determining the load capacity. Recognizing certain marketing and use advantages in maintaining width in preference to thickness of dry framing lumber, the western proposal was agreed upon at a meeting of the GSSC in December 1961 at Scottsdale, Ariz.

Dimension lumber dressed 1-1/2 inches thick dry was referred to as '2-inch nominal" as before.

A comment may be made here on the relation of that nominal size to the rough green size. This varies with the mill, but a representative situation is about as follows: To make dimension lumber 1-1/2 inches thick dressed at 19 percent maximum moisture content requires a "set-out" of 1-7/8 inches. Subtraction of 3/16 inch for the saw kerf leaves 1-11/16-inch rough green thickness. This is quite different from the 2-inch nominal thickness.

Since boards are often made by resawing from 2-inch dimension, the new 1-1/2-inchthickness required reconsideration of the standard board thickness. It was agreed at Scottsdale to recommend a new standard board 5/8 inch thick dry, which could be resawn from 1-1/2-inch dimension. A standard board 3/4 inch thick dry was also recommended. These recommendations were taken back to the regional associations for ratification, and industry research laboratories began in 1962 to develop technical data to show to users the utility of the thinner boards. Tests of strength, stiffness, and impact resistance were made to compare boards of various thicknesses and grades with plywood or other covering materials.

Definition of dry lumber in terms of moisture content proved to be difficult. There was early agreement on 19 percent, but disagreement on whether this should be an average or a maximum. A meeting of the GSSC at New Orleans in March 1962 recommended that "in those regions where conditions require, the moisture content restrictions may permit the inclusion of not more than 10 percent of any shipment in excess of 19 percent but no piece shall exceed 25 percent." As will be seen later, this recommendation was subsequently revised.

Lumber industry recommendations on board and dimension lumber sizes were transmitted to the American Lumber Standards Committee. The Forest Products Laboratory served as a technical advisor to ALSC in their consideration of the proposed size standards. The Committee, at a meeting at Chicago in January 1963, agreed that the moisture content basis for dry lumber would be 19 percent maximum and that equivalent green and dry sizes would be based on shrinkage to 15 percent average, which was considered to correspond to 19 percent maximum moisture content. It was agreed and subsequently written into the proposed new standards that "Reinspection provisions for moisture content in regional grading rules may include a provision permitting 5 percent of the pieces to exceed the allowable moisture content."

Various data on shrinkage related to these moisture contents were presented to the Committee. These were studied and debated extensively. In April 1963, the Laboratory reported to the Committee their recommendation after thorough study of all the data that green sizes be based on "average shrinkage values to 15 percent average moisture content of 2.35 percent of the thickness or 2.80 percent of the width of boards and 2-inch dimension." That recommendation was subsequently written into the proposed new standards.

The Department of Commerce followed closely the activities of American Lumber Standards Committee, and an advisor from Commerce attended all meetings of the Committee. Recognizing the widespread interest in the new proposals, the Commodity Standards Division issued in June 1963 an information bulletin on the organization of the Committee and its relation to the Department of Commerce (Appendix N). Functions of Commodity Standards in this connection were transferred later to the National Bureau of Standards, with the Forest Products Laboratory serving as technical advisor. The acceptor list for ratification of the new standards was reviewed and extended to some 22,000 names. Elaborate procedures were set up in the Bureau of Standards for polling the acceptor list and evaluating the responses to the poll.

American Lumber Standards Committee at a meeting in Washington, D. C., November 1, 1963, approved the new standards and asked the Department of Commerce to submit them to the acceptor list for ratification. The American Lumber Standard dry thickness of the 1-inch board was set at 3/4 inch, but provision was made for dry boards not less than 5/8 inch thick. Dry board widths were the same as in the previous standard and the same as those for 2-inch dimension. The ALSC Board of Review took action at the November 1 meeting on green sizes for the major construction species to be equivalent to the new dry sizes of dimension lumber. Those sizes were as follows:

Nominal dimension In.	Standard dry dimension In.	Equivalent green dimension In.
2	1–1/2	1–17/32
3	2–5/8	2–11/16
4	3–5/8	3–11/16
6	5–1/2	5–5/8
8	7–1/2	7–11/16
10	9–1/2	9–3/4
12	11–1/2	11–13/16

Somewhat smaller green sizes in recognition of smaller shrinkage values were subsequently adopted for redwood and western redcedar. It was agreed to publish the standard green sizes in an appendix to American Lumber Standards. The proposed revision was sent to the acceptor list by letter of the Secretary of Commerce dated April 3, 1964.

General Comment

Trend in Lumber Size Standards

There is strong competition not only among regional areas of lumber production but also between lumber and other construction materials. Survival of the lumber manufacturer demands the utmost efficiency. This economic pressure has been a compelling reason for the continuing erosion of standard sizes. Fifty years ago, 13/16 inch was a common thickness for the dressed 1–inch board, By 1929, 25/32 inch had become more common, the 3/4–inch board appeared in 1956, and the 5/8–inch board is now proposed. This latter value is no longer related to the nominal 1–inch thickness. Likewise, lumber dressed dry to 1–1/2 inches thickness does not require 2 inches rough green. The thinner boards and dimension are, of course, useful, and technical information to show their usefulness has been developed.

One difficulty with a reduction of standard sizes is that the lumber industry is continually on the defensive to justify those sizes to users and to avoid the view that the lumber manufacturer is degrading his own product. There is a tendency to overlook the industry effort to tailor its product to specific consumer needs.

Smaller sizes will reduce production costs of lumber but it remains to be seen how much. If lumber is thinner, raw material (log) costs will be less, and drying costs will also be reduced. On the other hand, the manufacturing cost and the cost of installation of a piece of board or dimension will remain practically unchanged.

Basis for Lumber Sizes

Earlier in this discussion a brief reference was made to suggestions that lumber standard sizes be based on the utility of the product rather than arbitrary units of measure. Let us first consider the units of measure.

The 1914 edition of Graves' Forest Mensuration (1) states, 'The board foot as a unit of measure for sawed lumber has been used in this country for a great many years. Thus the measurement of the superficial contents of boards is described in 'A Complete Treatise on the Mensuration of Timber' by James Thompson, published in Troy, N.Y., in 1805. At that time as shown in this same work, round logs were measured entirely in cubic feet, by the old Fifth Girth Formula, brought over from England. In this book there is no reference to log tables or to estimating the contents of logs in board measure."

Graves says further that "The earliest mention of a log rule for board measure, known to the author, is contained in 'A Table for Measuring Logs,' Anon., Portsmouth, Me., 1825." In view of the fact that there is no Portsmouth in the state of Maine, it is probable that this is a misprint and actually the reference is to Portland, Maine.

As time passed, the custom of estimating the contents, and the value of logs in terms of the measurement of the lumber that could be sawed from them, became the rule in this country. This system of measurement has been very convenient and useful and it has worked well. However, it has been an obstacle to the sawing of standard sizes that depart much from the concept of the traditional board foot. Nevertheless, actual sizes have become adjusted to suit markets. To illustrate, for many years eastern hardwood producers have sawed 1-inch lumber 1-1/16 inches thick so that when air-dry it will measure 1 inch. Softwood 1-inch shop lumber is commonly sawed full thickness so that when kiln-dried and surfaced it will meet the requirements of the woodworker. Yard grades of boards for construction are often sawed somewhat scant in thickness without affecting their usefulness to builders. The thicknesses are different yet each is measured by the same unit. The log scale is not affected, but mill realization is affected by a variable factor of overrun.

When, however, thicknesses are much thinner than the customary 1 or 2 inches, misunderstandings about board measure are likely to arise. The industry has been reluctant to adopt the "surface foot" or the 'superficial foot" as a unit of measure. However, if lumber 1-1/2 inches thick is called '2-inch dimension." it must be recognized that "nominal" is not the same as "rough green" size.

When the problem of measurement is solved to the satisfaction of all concerned it may be easier to agree on utility standards that provide for the principal use requirements without creating a confusing multiplicity of sizes. This is not a simple task. For example, a board that is thick enough to cover an area may lack strength and stiffness for other uses. It is probable that adjustments and compromises will have to be made in the interest of standardization.

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Appendix A

STANDARD SIZES OF LUMBER
(From Table 10, "Lumber and its Uses," Kellogg, 1914)

WOOD	BOARDS (inches)	DIMENSION (inches)
White & Norway Pine (Northern Pine Mfrs. Assn.)	S1S or S2S to 25/32	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-5/8 x 3-5/8 -- 5-5/8 -- 7-5/8 -- 9-5/8 -- 11-5/8
North Carolina Pine (North Carolina Pine Assn.)	S1S to 7/8, S2S to 13/16	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-3/4 x 3-3/4 -- 5-3/4 -- 7-3/4 -- 9-3/4 -- 11-3/4
Longleaf Pine (Ga. - Fla. Sawmill Assn.)	S1S or S2S to 13/16	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-5/8 x 3-5/8 -- 5-5/8 -- 7-5/8 -- 9-518 -- 11-5/8
Longleaf & Shortleaf Pine (Southern Pine Assn.)	S1S or S2S to 13/16	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-5/8 x 3-5/8 -- 5-5/8 -- 7-1/2 -- 9-1/2 -- 11-1/2
Cypress (So. Cypress Mfrs. Assn.)	S1S or S2S to 13/16	2" S1S or S2S to 1-3/4 3/8 scant for S1E, 1/2 for S2E
Douglas Fir, W. Hemlock, Cedar, & Spruce (West Coast Lbrms. Assn.)	S1S or S2S to 314	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-5/8 x 3-5/8 -- 5-5/8 -- 7-1/2 -- 9-1/2 -- 11-1/2
Hemlock & Tamarack (N. Hem. & Hwd. Mfrs. Assn.)	S1S or S2S to 13/16	2 x 4 -- 6 -- 8 -- 10 -- 12 S1S1E 1-3/4 x 3-3/4 -- 5-3/4 -- 7-3/4 -- 9-3/4 -- 11-3/4
Idaho White Pine, Western Pine, Fir, & Larch (Western Pine Mfrs. Assn.)		2 x 4 -- 6 -- 8 -- 10 -- 12 -- 14 1-5/8 x 3-5/8 -- 5-1/2 -- 7-1/2 -- 9-1/2 -- 11-1/2 -- 13-1/2 all S1S1E
Redwood	S1S to 13/16	
Sugar & California Wt. Pine	S2S to 7/8	

Note: In addition a special kind of board called "Roofers" was made. Roofers were 3/4-inch thick and usually D & M. Boards S2E varied from 1/4 inch to 1/2 inch scant of nominal. S4S lumber was commonly surfaced to the same dimensions as S1S1E.

Appendix B

STANDARD SIZES FOR YARD LUMBER

(Recommended for consideration by Lumber Manufacturers by Conference of Producers, Distributors, and Consumers, Chicago, Ill., October 18, 1921)

Nominal size		Proposed sizes [1]			
Thickness	Width	Rough lumber [2] (minimum size)		Finished lumber (standard size)	
		Thickness	Width	Thickness	Width
In.	In.	In.	In.	In.	In.
COMMON BOARDS AND STRIPS					
1 S1S	2	15/16		718	
1 S2S	3	15/16		13/16	
1-1/4	4	1-3/16	3-7/8	1-1/8	3-5/8
1-1/2	5	1-7/16		1-3/8	
	6		5-7/8		5-5/8
	7				
	8		7-3/4		7-1/2
	9				
	10		9-3/4		9-1/2
	12		11-3/4		11-1/2
DIMENSION					
2	2	1-3/4		1-5/8	
2-1/2	3	2-1/4		2-1/8	
3	4	2-3/4	3-7/8	2-5/8	3-5/8
4	5	3-3/4	4-7/8	3-5/8	4-5/8
5	6	4-3/4	5-7/8	4-5/8	5-5/8
	7		6-7/8		6-5/8
	8		7-3/4		7-1/2
	9		8-3/4		8-1/2
	10		9-3/4		9-1/2
	12		11-3/4		11-1/2
	14		13-3/4		13-1/2

[1] Proposed sizes are based on air-dried stock with maximum of 20 percent moisture. Proposed finished sizes are S1S1E or S1+S material unless otherwise noted.

[2] Minimum sizes for "Rough Lumber" were included at the request of the Conference and are submitted to the manufacturers for approval or disapproval.

Recommendations as to Standard Sizes and Grades of Lumber Are Explained by the Central Committee

WASHINGTON, D. C., Nov. 27.—The Central Committee on Lumber Standards has just issued the following "explanation of recommended American lumber standards as reported by the Central Committee on Lumber Standards." [Note: In order that the reader may intelligently follow this explanation it is suggested that he refer to pages 34, 35 and 36 of the Nov. 10 issue of the AMERICAN LUMBERMAN on which were printed the recommendations for American lumber standards.—EDITOR.] The explanation of the recommended standards follows:

The following brief explanations refer to the Recommended American Lumber Standards, reported to the United States Department of Commerce by the Central Committee on Lumber Standards, as presented and numbered in the circular reprinted under date of *Nov. 22, 1923*, copies of which have been furnished to interested organizations and the lumber trade press.

Paragraphs 1, 2, 3, 4 and 5 are self-explanatory. Proposed in the interest of uniform usage in the lumber trade and based on the generally prevailing practice in the industry today.

Paragraph 6. A general principle agreed to by producers, distributers and consumers from the beginning.

Paragraphs 7, 8, 9, 10, 11, 12, 13. To secure similar names for comparable grades of different species used in the same markets for the same purposes. Represents a vast expenditure of time, money and effort by the associations which publish and administer grading rules for yard lumber. Based upon definite recommendations of United States Department of Agriculture. Supported by unanimous vote of committee representing the associations which publish yard lumber rules.

Paragraph 14. One-inch boards and 2-inch dimension are the most generally used sizes of *ordinary yard lumber. The boards are used largely for covering* purposes, the dimension largely for framing purposes. These two sizes are basic. Around them for five years has centered most of the controversy over sizes. If these two basic sizes can be standardized in actual practice, the standard sizes of most of the other less important items can be more readily maintained.

The committee's recommendation contemplates that for ordinary covering and general utility purposes the consuming public should be encouraged to use the *Standard Board.* This would be not less than ¾-inch thick in commercially dry condition.

Similarly, for ordinary *framing* and bracing purposes etc., the consuming public should be encouraged to use *Standard Dimension.* This would be not less than 1⅝-inch thick, dressed.

It is not intended that the terms 1-inch boards and 2-inch dimension be discontinued because, obviously, the *Standard Board* and *Standard Dimension* are measured as 1 inch and 2 inches, respectively. Furthermore, these designations are firmly fixed in the lumber trade and it is the committee's thought that existing custom and *practice, unless unsound, illogical or unreasonable,* should not be disturbed.

The use of the term *Standard Board,* therefore, is advocated not because it happens to be *1-inch lumber* but because it represents the best and most practical size for the ordinary *general utility purposes* of the consumer and should therefore be described to him as such.

Similarly with the *Standard Dimension.* If the average lumber user can be gradually educated to use *Standard Boards* and *Standard Dimension* for his ordinary purposes, it is believed that he will benefit thereby, and the maintenance of these size standards will have become much *more effective.*

Therefore, no board thinner than ¾-inch, dry, should be sold as a *Standard Board;* and no dimension less than 1⅝-inch should be sold as *Standard Dimension.*

The use of the description *Standard* is in accord with the purpose of the committee to focus the mind of the consumer upon the *advantages* and *economy* of confining his purchases to lumber of standard size. It should have educational value and should have the effect of emphasizing to the consumer the superior *utility* or *use* value of the *Standard Board* and the *Standard Dimension.*

Paragraphs 15, 16, 17 and 18. Standard Thicknesses and Widths of Yard Lumber. Opinion on yard lumber sizes has been divided chiefly on 1-inch and 2-inch lumber; and, to a less extent, on the widths of finished lumber.

Thickness

During the more than four years of investigation conference and argument over lumber sizes the preferences of every group among the lumber consumers distributers and producers have been carefully considered The committee's size recommendations are not submitted with the claim that they represent the maximum utility or the ideal from every point of view. The committee believes that they represent good usage and good utility, that they are practical of present application and that a national standardization on the basis of the sizes recommended would constitute a vast improvement over the present conditions and obvious tendency toward constantly reduced dimensions of yard lumber.

Twenty-five/thirty-seconds-inch, recommended as the minimum finished thickness of inch lumber is the *maximum* thickness under good conditions of manufacture, well seasoned air dry, that can be secured from lumber originally cut full 1-inch thick, namely, in the rough green condition which is the basis of board measure. The *average* variation in sawing, or tolerance is $\frac{1}{16}$-inch: the average shrinkage per inch, air dried, is 1/32-inch: the minimum allowance for surfacing two sides under good manufacturing conditions is $\frac{1}{8}$. The total reduction in size, therefore is $\frac{7}{32}$-inch leaving $\frac{25}{32}$ which is the recommended minimum The United States Forest Products Laboratory has recommended $\frac{13}{16}$-inch. allowing $\frac{1}{16}$-inch for variation in sawing $\frac{3}{32}$-inch for air drying and $\frac{3}{32}$-inch as the minimum allowance" for surfacing two sides. The experience of the industry, including producers, distributers and consumers, is that $\frac{1}{16}$-inch is necessary allowance for surfacing one side or $\frac{1}{8}$ for two sides of 1-inch lumber.

If the allowances were based on kiln dry lumber where the shrinkage is usually $\frac{1}{32}$-inch greater than the shrinkage in air dried lumber, the maximum under good manufacturing conditions as above described on kiln dried stock would be little, if at all, in excess of 24/32 or $\frac{3}{4}$. The recommended minimum standard of $\frac{25}{32}$ therefore represents good manufacturing practice in the refinement by drying and surfacing of rough softwood lumber.

It is to be noted also that boards $\frac{25}{32}$-inch thick well seasoned and particularly when properly kiln dried are both stronger and stiffer than boards $\frac{13}{16}$-inch thick to the condition of inadequate dryness in which heretofore considerable quantities of yard lumber have been shipped; also that the proportion of lumber shipped in adequate commercially dry condition is increasing; and that the proportion of yard lumber of common grades that is being kiln dried is fast advancing.

This recommendation includes $\frac{13}{16}$-inch as standard inch lumber. It precludes, however, the sale as *Standard Boards* of $\frac{3}{4}$-, $\frac{11}{16}$-, and $\frac{5}{8}$-inch lumber

There are twelve associations publishing and administering rules for the grading and inspection of softwood yard lumber. The total production represented in these associations is approximately 10,000,000000 feet annually not to speak of the lumber shipped on the association grades by non-members or non-subscribers. Of the output of boards S1S or S2S, 54 percent is now being shipped $\frac{3}{4}$-inch or less; 15 percent, $\frac{25}{32}$-inch 31 percent, $\frac{12}{16}$-inch ; of the total output of lumber sold as 2-inch dimension, 11 percent is now 1¾-inch: 86 percent, 1⅝-inch ; 3 percent, $1\frac{9}{16}$-inch. These thicknesses for dimension are the official standard but an increasing proportion nominally 1⅝ inches thick is little, if any thicker than 1½ inches commercially dry. On boards therefore, nearly 70 percent is now less than $\frac{13}{16}$ and more than 50 percent is less than 33. On dimension nearly 90 percent is less than 1¾ and a small and increasing proportion is less than 1⅝.

At the time of the standardization conference four years ago, the agreement of at least 50 percent of the manufacturers could have been secured on a standard of $\frac{13}{16}$ as the minimum thickness for inch lumber. Today the agreement of 30 percent can not be secured to that standard, so far has the tendency toward increasing variation in sizes proceeded during the short period of four years.

Approval of lumber producers' organizations representing approximately 95 percent of the softwood lumber production may probably be secured to the recommendation of $\frac{25}{32}$-inch as a minimum thickness for standard inch lumber. On no other minimum standard is there even a majority agreement; and on any thicker minimum there is not even a one-third agreement.

Southern pine and the west Coast woods are the dominant factors in softwood yard lumber. No standards can be expected to be permanent or generally adhered to which are not observed by the manufacturers of southern pine and fir. The committee's recommendation of $\frac{25}{32}$-inch as the minimum for 1-inch lumber necessitates a far-reaching and difficult concession by each of these groups. The committee has reason to believe that they will agree to the recommended sizes and will observe them in practice.

[NOTE: In the revised and corrected report of recommended American lumber standards, paragraphs 19 to 23 inclusive read as given below. Paragraph 19 in the original report has been omitted and paragraphs 20, 21, 22, 23 and 24 have consequently been renumbered as 19, 20, 21, 22 and 23. In comparing with the report as printed in the Nov. 10 issue of the AMERICAN LUMBERMAN, this corrected report should be used.]

IV. Methods of Lumber Measurement

19. The following thicknesses and widths of yard lumber shall be considered *standard.* All other sizes shall be considered special.

Thicknesses: $\frac{5}{16}$, $\frac{7}{16}$, $\frac{9}{16}$, $\frac{11}{16}$, 1, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{2}$, $3\frac{1}{2}$, 4 inches, board measure, and up in multiples of 1 inch; for rustic, drop siding and partition. $\frac{3}{4}$ inch; for bevel siding, $\frac{1}{2}$ x $\frac{3}{16}$-inch and $\frac{5}{8}$ x $\frac{3}{16}$-inch.

Widths: 1 inch and up, board measure, in multiples of 1 inch.

Sard lumber of standard size shall be described by these standard dimensions.

20. Lumber of standard size shall be tallied *board measure.* On lumber of standard thickness less than 1 inch (board mensure), the board foot measurement shall be based on the surface dimensions.

21. The board measurement of dressed lumber of standard size shall be based upon the corresponding standard dimensions of rough green lumber.

22. Lumber finished to special size shall be counted (tallied) as of the standard rough size necessarily used in its manufacture.

23. The measurement and description of the dimensions of yard lumber shall he as follows :

Thickness of yard lumber measured and described as	Minimum Thickness S1S or S2S: at standard commercially dry shipping weight and moisture content. Inches
1 inch, board measure. to be not less than	$\frac{25}{32}$"
$1\frac{1}{4}$ inches; board measure, to be not less than	$1\frac{1}{32}$"
$1\frac{1}{2}$ inches, board measure, to be not less than	$1\frac{9}{32}$"
$1\frac{3}{4}$, inches, board measure, to be not less than	$1\frac{7}{16}$"
3 inches, board measure, to be not less than	$1\frac{5}{8}$"
$2\frac{1}{2}$ inches, board measure, to be not less than	$2\frac{1}{8}$"
3 inches, board measure, to be not less than	$2\frac{5}{8}$"
$3\frac{1}{2}$ inches, board measure, to be not less than	$3\frac{1}{8}$"
4 inches, board measure, to be not less than	$3\frac{5}{8}$"

Widths of boards, dimension and finish, measured and described as 2, 3, 4, 5, 6, and 7 inches, board mensure, to be respectively, not less than $1\frac{5}{8}$, $2\frac{5}{8}$, $3\frac{5}{8}$, $4\frac{5}{8}$, $5\frac{5}{8}$ and $6\frac{5}{8}$ inches, S1E or S2E, at standard commercially dry shipping weight and moisture content; widths of boards, dimension and finish, measured and described as 8, 9, 10, 11 and 12 inches, board measure, to be, respectively, not less than $7\frac{1}{2}$, $8\frac{1}{2}$ $9\frac{1}{2}$, $10\frac{1}{2}$ and $11\frac{1}{2}$ inches.

The description of thickness of dressed stock less than 1 inch thick, board mensure S1S or S2S, to be its actual thickness at standard commercially dry shipping weight and moisture content.

(Note: It is to be understood that the standard dimensions of rough lumber, commercially dry, are in excess of the dimensions of finished lumber of the corresponding size, board measure, by the amount necessary to permit of surfacing either one side or two sides and/or one edge or two edges.)

2-inch Dimension

A minimum finished thickness for 2-inch dimension of $1\frac{5}{8}$ inches has been made for the following among other reasons :

1. As above indicated, considerably more than 80 percent of the present standard practice is on this basis.

2. "The demands made upon 2-inch dimension for use as joists will be properly met by a dry finished thickness of $1\frac{5}{8}$ inches for widths up to and including 12 inches. A thickness greater than this would add to the cost without increasing its usefullness." (Page 23*)

"On account of the relatively enormous consumption for joists and studding those uses should govern the thickness of 2-inch stock." (Page 22*)

"Since the thickness of $1\frac{5}{8}$ inches has been found best suited for use in joists, it should govern in studding." (Page 23*)

In other words, $1\frac{5}{8}$ inches is the minimum thickness recommended as representing approximately 80 percent of the present practice and as constituting the best utility size as determined by investigation of actual uses. This, however, does not nor is it intended to preclude the manufacture and sale, where trade conditions demand it, of lumber thicker than $1\frac{5}{8}$ inches. It does preclude and is intended to preclude the sale as *standard* of dimension less than $1\frac{5}{8}$ inches.

Present Variations In Sizes

In the yard lumber grading rules of the twelve associations herein referred to, twenty-six *different* standard finished dry thicknesses are recognized for yard lumber items of thicknesses *2 inches and less,* not including bevel siding or moldings or worked lumber of any kind. This variation runs as follows :

$\frac{3}{16}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{11}{16}$, $\frac{3}{4}$, $\frac{25}{32}$, $\frac{13}{16}$, $\frac{27}{32}$, $\frac{7}{8}$, $1\frac{1}{16}$, $1\frac{9}{32}$, $1\frac{1}{8}$, $1\frac{5}{32}$, $1\frac{1}{4}$, $1\frac{9}{32}$, $1\frac{9}{16}$, $1\frac{11}{32}$, $1\frac{5}{8}$ $1\frac{13}{32}$, $1\frac{5}{8}$, $1\frac{25}{32}$, $1\frac{3}{4}$.

The absurdity uselessness and wastefulness of such a wide variation in finished thicknesses up to

(*Above quotations from United States Department of Agriculture Circular 296 "Standard Grading Specifications for Yard Lumber." as recommended by the Department of Agriculture.)

2 inches are obvious without argument. In place thereof the committee recommends the standard sizes enumerated in Paragraph 19, representing a total of ten standard finished thicknesses in place of the twenty-six thicknesses provided in the present official rules for grading of yard lumber, which are now being bought and sold in many of the same markets and used by the same consumers for the same purposes.

At present there are not less than seven different actual finished thicknesses of lumber being sold as 1-inch lumber. At least three of these sizes are less than ¾.

Substantially, the issue before the lumber trade is its willingness and ability to determine for itself a definite and practical system for describing the quality and measuring the quantity of lumber bought and sold. The committee has therefore proposed a definite formula for measurement of yard lumber, and standard sizes in strict accord therewith.

The committee has submitted its recommendation on lumber sizes as being fundamentally and logically sound and as representing the closest approach to the standards of maximum utility to which there is any reasonable probability of securing the agreement of the various elements in the lumber trade itself from producers to consumers.

Paragraph 17. Standard Widths of Yard Lumber. The committee in its recommendation on widths has followed the recommendations of the United States Department of Agriculture,† based upon its elaborate investigation of consumers' requirements and maximum economy in manufacture and distribution.

"* * * the following sizes are the maximum that may be obtained from lumber cut to the full nominal size in the rough green condition. * * *

"In determining the standard widths of lumber the same elements must be considered as for thickness. Variation in sawing has been found to be ⅛-inch on all widths, and the amount of material necessary for ordinary dressing on the edges about ¼-inch. In the matter of shrinkage, however, an allowance of 1/12-inch per inch of width would give a different total shrinkage, and thus a different finished size, for each width. Such a situation would be inadvisable from the manufacturers' as well as from the distributers' standpoint. Therefore, widths are divided into two groups, one group up to and including 7 inches and the other 8 inches and above. In the first group an allowance for shrinkage of ⅛-inch is made. In the second group an allowance of ¼-inch is made. Thus the total allowance for variation in sawing, shrinkage and dressing on the edges, for boards and dimension up to and including 7 inches in width, is ⅝-inch. The allowance for boards and dimension 8 inches and over is ½-inch. This allowance is sufficient for ordinary dressing, but where a tight-fitting tongue-and-groove or rabbet joint is required on sizes 7 inches or less in width, an additional ⅛-inch of wood must be removed."

Present Variation in Widths

The present published grading rules show wide variation in the widths of lumber of the same nominal sizes. The following comparison shows the present standard practice in the manufacture of softwood yard lumber in the various regions, which are covered by published grading rules:

DIFFERENCES BETWEEN NOMINAL WIDTHS AND WIDTHS S1E OR S2E, AS SHOWN BY GRADING RULE BOOKS

Association—	Finish		Common boards		Dimension	
	Narrower Width	Wider Width	Narrower Width	Wider Width	Narrower Width	Wider Width
Calif. Redwood Assn.	½	½	½	½	½	½
Calif. White and Sugar Pine	¼	¼	¼	¼	*	..
Georgia-Florida Sawmill Assn.	½	⅝	½	⅝	⅝	½
Michigan Hardwood Mfrs.' Assn.	½	½	½	½	¼	¼
North Carolina Pine Assn.	⅝	½	⅝	½	⅝**	½
Northern Hemlock and Hardwood	⅝	⅝	⅝	⅝	⅝	⅝
Northern Pine Mfrs.' Assn.	½	½	½	½	½	½
Southern Cypress Mfrs.' Assn.	½	½	½	½	⅝	⅝
Southern Pine Assn.	⅝	½	⅝	½	⅝	½
West Coast Lumbermen's Assn.	½	⅝	½	½	⅝	½
Western Pine Mfrs.' Assn.	⅝	⅝	⅝	⅝	⅝	½

*Does not manufacture "Dimension."

**In practice is ¼-inch off.

Proposed Widths of Finish; Common Boards and Dimension

⅝-inch off on lumber of standard widths less than 8 inches.

½-inch off on lumber of standard widths of 8 inches and over.

Illustrated in another way, and weighted in accordance with the relative volume of shipments, the present condition in the narrower widths alone is as follows:

1. In *Finish* of narrower widths (that is, up to 8 inches, approximately).
   - 46 percent is ½ inch off the nominal width.
   - 44 percent is ⅝ inch off the nominal width.
   - 10 percent is ¼ inch off the nominal width.
2. In *Common Boards* of narrower widths:
   - 46 percent is ½ inch off the nominal width.
   - 44 percent is ⅝ inch off the nominal width.
   - 10 percent is ¼ inch off the nominal width.
3. In *Dressed Dimension* of narrower widths:
   - 8 percent is ½ inch off the nominal width.
   - 3 percent is ¼ inch off the nominal width.
   - 88 percent is ⅝ inch off the nominal width.
   - 6 percent is ¼ inch off the nominal width.

(Note: These percentages include North Carolina pine lumber as surfaced ¼-inch off, inasmuch as this is understood to be the actual practice in much of that region, altho the published standards are as indicated.)

Simple and Uniform Standards Recommended

The committee's recommendation of ⅝-inch off on the widths less than 8 inches, and ½-inch off on wider widths, represents the least practicable disturbance of present general practice consistent with reasonable convenience and uniformity. The widths are the maximum that, for the average of the important softwood species, can be manufactured from boards cut in the rough full to the indicated size.

The recommended standard widths for studding, flooring, ceiling partition, shiplap and dressed and matched factory flooring, heavy roofing, decking and sheet piling are definitely related to the recommended standard widths of finish, common boards and dimension. These recommendations are also based on the principle of securing, first, the maximum of uniformity; second, the minimum of change in present practice, and, third, standard widths not less than the widths which under good conditions of manufacture can be secured from lumber cut to full indicated size rough.

Paragraph 19. Method of Lumber Measurement. The recommendation provides that the dimensions of lumber of standard size be described by the standard thicknesses and widths as shown. The thicknesses less than 1 inch board measure are actual thicknesses representing lumber in the surfaced commercially dry condition. The standard thicknesses 1 inch and over are based on corresponding standard rough dimensions. Reference to standard lengths has been omitted in order that there may be no possible confusion involving any determination of the proportions, if any, of short and odd length lumber admissible in shipments of various grades and items of yard lumber. The committee's recommendation is that that matter be held for subsequent and separate determination after committee conferences may have developed a closer approach to agreement among the representatives of various branches of the lumber trade and the lumber consumers than now apparently exists.

Paragraphs 20, 21 and 22. These provisions are self-explanatory and are in accord with the best of present practice and custom in the industry. The framework of the lumber industry has been built around the principle of board measure. Recently there have been numerous departures from this customary system of lumber measurement. These have taken the form of lineal measure, surface area, piece measure etc., or combinations thereof. The committee recommendations represent the belief that the standard board foot method of lumber measurement traditional in the lumber industry should be universally applied. This is in accord with its purpose to promote a uniform system, so to speak, of "weights and measures" in the lumber trade similar, in its benefits of economy and convenience, to those prevailing in other industries whose manufacturing and distributing processes and methods have been more completely standardized than have those of the lumber industry.

For this purpose the committee has recommended the definite method of lumber measurement provided in Paragraph 20 with its more elaborate specific application in Paragraph 23. The basis of board measurement is described in Paragraph 21, this being an explicit recognition of the meaning of "board measure" as developed in the usage of the lumber industry during the last hundred years and briefly described in the following explanation‡:

"In the early days of lumber manufacture practically all lumber cut into boards or planks was sold on surface measure. A surface area of 1 square foot was considered 1 board foot, regardless of the thickness. Timbers, however, were sold on cubic measure. A need then arose to measure logs in terms of lumber measure. Thus it was necessary to adopt a standard thickness for the board foot, and gradually it became the practice to consider 1-inch as that standard for thickness. Lumber thicker than 1-inch was measured as the product of its surface area in square feet by the thickness in inches, while lumber thinner than 1-inch remained on surface measure. This board-foot unit was applied to lumber in the rough. Dressed lumber was always considered as of the same footage as the rough lumber used in its production.

"Today very little yard lumber is sold in the rough, altho the rough unit of measurement is used as the basis of computation and the rough or nominal size is used to designate individual items of lumber. Board-foot measurement is actual measurement when applied to rough green lumber only. In the same way, nominal sizes are actual only when applied to rough green lumber.

"The board-foot standard is the most advantageous unit of measurement yet devised for use in computing lumber production and costs from the stump to its final use, in comparing prices of various products, and in compiling statistics of the lumber industry. Nevertheless, the purchaser of dressed lumber must keep in mind that sizes and measurements are purely nominal."

Paragraph 23. This recommendation is self-explanatory as constituting a detailed application of the recommended method of lumber measurement in Paragraphs 20 and 22. It is to be noted that the *method of measurement* considered by itself and on its own merits has no direct relation to the specific *sizes* which may have been agreed upon as standard. In other words, this provides a *formula* for the board foot measurement of whatever sizes may be agreed upon as standard. For illustration, it provides that lumber less than 1⅝ inches thick surfaced and dry may not be measured and described as 2-inch lumber. This does not preclude the measurement and description of lumber 1¾ inches surfaced and dry as 2-inch lumber, but does prohibit the measurement, for example, of 1½-inch material surfaced and dry as 2-inch lumber board measure.

The minimum thicknesses shown in the last column under Paragraph 23 represent the finished sizes which with average allowances of shrinkage for the principal softwood species, with the average variation in sawing, or tolerance, in good manufacturing practice, and the average allowance for dressing, ought to be possible of manufacture out of material originally cut in the rough to the indicated thickness and width.

It is recognized that whatever standards for finished widths and thicknesses are devised, some mills under specially favorable conditions of manufacture, shrinkage and variation in sawing, can meet the finished size standards out of rough lumber sawn thinner than is necessary in other sawmills cutting lumber with proportionately greater shrinkage, greater variation in sawing and a larger necessary allowance for cleaning the surface of the board. *Such condition, however, will necessarily exist whatever finished size standards are adopted.* The finished dry sizes of yard lumber are the only sizes which are physically capable of standardization with any such degree of precision as is represented in the argument thruout the trade over thirty-seconds and sixteenths of an inch. Rough sizes either green or dry are inherently incapable of any such precise standardization as is represented in the standardization program. The only point at which the manufacturer or planing mill operator has exact control over dimensions is in the process of surfacing the sides and edges, provided the material is dry. The finished dimensions under good manufacturing practice are controllable by proper spacing of knives which can then be adjusted at least to a precision of thirty-seconds of an inch.

Between 85 percent and 90 percent of yard lumber is now shipped surfaced, and the proportion is increasing. Size standards are properly, therefore, based directly upon the finished dimensions of surfaced lumber in commercially dry condition. Consequently, it is to be understood that the standard dimensions of rough lumber commercially dry are sufficiently in excess of the standard dimensions of finished lumber of the corresponding sizes as to permit the surfacing of one or two sides or one or two edges.

Paragraph 24. Inasmuch as the size standards are related to the condition of standard commercial dryness and inasmuch as this condition of dryness varies with the moisture content and hence with the shipping weight of lumber, the committee has recommended that the standard shipping weights to be used for the purpose stated in Paragraph 24 shall be those which are recognized and in effect at the time shipment is made.

Paragraphs 25, 26, 27, 28 and 29. Shipping and Other Provisions. These recommendations explain themselves and constitute their own recommendation. An agreement among producers, distributers and consumers on lumber standards is by itself inadequate to accomplish the purpose of standardization. Means for promoting the observance in practice of the standards adopted are indispensable.

Paragraphs 30, 31, 32 and 33. These provisions likewise are in the interest of securing observance in practice of the published lumber size and grading standards.

Paragraphs 34, 35, 36 and 37. These recommendations likewise are in the interest of enforcing agreed standards. Additional provisions of similar purport may perhaps wisely be added. Such other provisions are under consideration by the committee.

Paragraph 38. By common acceptance and for reasons which will be readily apparent, a definite designation for the lumber standards proposed for agreement has been included in the committee's recommendation. The recommended designation has obvious advantages of simplicity and publicity appeal.

In Conclusion

The Central Committee, under the commission which it received from lumber producers, distributers and consumers in July, 1922, has assumed that there exists among the lumbermen generally the *purpose* and *willingness*, to which the lumber industry has publicly pledged itself, to standardize sizes and grades and to maintain these standards in actual practice.

†Page 25 United States Department of Agriculture, Circular 296.

‡From page 16 of the United States Department of Agriculture, Circular 296, "Standard Grading Specifications for Yard Lumber."

Standardization obviously means that changes somewhere must be made. Each region and each group has of course preferred to have other regions and other groups do the changing. With but few conspicuous exceptions, however, tolerance of spirit, open-mindedness, and sincere desire for constructive progress have been manifested in a remarkable degree. The committee is convinced that the recommendations now submitted to the lumber trade and consumers thru the secretary of commerce will be considered by the interested public in the same broad spirit and with a desire for constructive action equal to that exhibited by their committee representatives.

The fact that these recommendations have been made by the unanimous vote of the *eight groups* (manufacturers, wholesale dealers, retail dealers, engineers, architects, contractors, railroads and wood using industries) represented on the Central and Consulting committees is itself evidence that this spirit and this purpose have characterized the action of the responsible committees of producers, dealers and consumers which have joined in these recommendations. Their recent public endorsement by the secretary of agriculture and its public appeal for the adoption and practice of the American Lumber Standards recommended by the Central Committee as reflecting "constructive progress," are additional convincing evidence if further evidence be needed, that the standards recommended are fundamentally sound and in the public interest.

Much has been said of the large direct savings and economies to be derived from lumber standardization. Much has been said of definite national standards of lumber sizes and grading as a direct contribution to the sound, honest and efficient conduct of the lumber trade on the highest plane of integrity economy and service. Again It has been characterized as a vital aid to the orderliness, stability and profitableness of the lumber business. Furthermore the nationally organized standardization effort of the lumber trade is a direct test of the capacity of the lumber industry for self-government. that is, of its own standards, methods and operations, in such manner as to secure on the one hand, reasonable service without needless waste, and at reasonable cost to the public and on the other hand orderly efficient and profitable business for those engaged in the industry itself.

In the consideration therefore, of the recommendations of the Central Committee on Lumber Standards reported to the secretary of commerce, the organizations to which it has been submitted are confronted, in the opinion of the committee, with two alternatives.

First the approval of the standards so far as essential features are concerned, substantially as now recommended ; or,

Second, the indefinite prolongation of controversy within the industry over the comparative merits of differing individual, regional and group views, with the virtually certain prospect of further increasing variation in size and grading standards and of indefinite prosponement of the realization, within the lumber trade itself, of any national standards.

The committee suggests that those organizations to which the secretary of commerce has submitted its recommendations be prepared, at the conference in Washington, Dec 12 and 13, to suggest the time at which, and the ways and means by which, the standard: then agreed upon should be made effective in the conduct of the lumber trade.

Promoting Observance of Standards

WASHINGTON, D. C., Nov. 27.—Methods of promoting observance of lumber standards are discussed in a letter written by Wilson Compton, chairman of the Consulting Committee on Lumber Standards, to Fred H. Ludwig, of the Merritt Lumber Yards, (Inc.), Beading, Pa., in response to a communication seeking light on this subject. Mr. Compton says:

You will recall our conversation leaving Laurel, Miss., on Nov. 16 regarding the practicable ways and means of securing the observance in practice of such standards of size and grading of lumber as may be agreed upon by the voluntary act of lumber producers, distributers and consumers.

May I, as suggested at that time, enumerate suggested ways and means which I believe to be deserving of consideration, Some are directly involved in the standardization recommendations now before us, others will no doubt be discussed, at the conferences in Washington next month:

1. The use of the organized official inspection services of the lumber associations which publish standard grading rules, as a means of enforcing the observance of the size and grading standards incorporated in the rules under which the lumber has been purchased or sold.

2. By grade marking of standard lumber including an appropriate brand or insignia indicating that it is standard size.

3. Advertising to the lumber trade and to the lumber using public of standard lumber.

4. Injunctions promptly secured against sellers of lumber who announce that they deal in standard lumber, make contracts of sale on the basis of agreed American lumber standards and deliver lumber which is not standard.

5. The appeal to public confidence by means of the certification of the Departments of Commerce and Agriculture that the standards are sound, in the interests of economy, and for the good of the public as well as of the lumber trade; also their public recommendation and appeal that the ordinary transactions in the lumber trade be confined to the purchase and sale of standard lumber.

6 A limitation upon such shipping provisions as the so called 5 percent clause; also the provision for the acceptance by the buyer of that part of the shipment up to standard without prejudicing his just claims with respect to the remainder, in such a way as to confine them to dealings in standard lumber, excluding from their benefits special sizes, special grades and special workings.

7. Using the opportunity for nation-wide sentiment making, offered during the next several months in the annual conventions of organizations representing lumber dealers, lumber producers and consumers; this for the purpose of establishing gradually a recognized general custom.

8. The provision on the letterhead and in order blanks and statements of terms of sale by buyers and sellers of lumber that their dealings are in accordance with the American lumber standards; these standards thus to become an implied part of the contracts of purchase and sale.

9. The specific indication on invoices, on tally cards and on shipping papers of lumber which is not of standard size, standard grade or standard working.

10. The gradual accumulation of public good-will value of American lumber standards as a business asset.

There is, to be sure, in addition a natural expectation based on the obvious experience of other industries, altho of course it will necessarily continue as heretofore to be dependent upon the voluntary act of individuals, that, other conditions being equal, lumber of standard size, standard grade and standard working will cost less than lumber of special size, special grade and special working.

Altho we did not, so far as I recall, discuss the further question of the time at which such standards as may be agreed to should be considered as effective, I suggest that that too is an important feature which deserves consideraqtion. On the basis merely of such inquiry as I have myself been able to make. I gather the impression that an agreement on such standards to be effective perhaps June 1 or July 1, 1924, would give ample opl[portunity for such adjustments and modifications of published rules for grading and inspection of yard lumber as might be necessary, and would also afford the important opportunity during the coming lumber convention season for nation-wide sentiment making in behalf of the purchase and sale and use of standard lumber.

A STATEMENT OF THE ELEMENTARY ARGUMENTS WHICH CONTROLLED IN THE RECOMMENDATION OF MEASUREMENT IN THE GREEN ROUGH AS THE STANDARD CONDITION FOR THE VOLUME MEASUREMENT OF LUMBER, KNOWN AS THE "BOARD FOOT METHOD."

PREAMBLE: To get a right view of the conditions involved it seems desirable that certain axiomatic facts and principles shall be stated as a basis for the conclusions reached as a result of the deliberations of the Central Committee on Lumber Standards supplemented by the Consulting Committee created by it. We, therefore, offer statement of facts and principles as follows:

1st. The variability of material volume. All material is subject to volume change.

2nd. Essentials to standards of volume measurement. Since actual units of material of every type are subject to volume variation dependent on seasoning temperature and moisture content, these factors) must be definitely fixed before any standard of volume measurement for any given commodity can be established.

3rd. Time and condition of measurement. Since conditions of moisture content and temperature can be established at any age or state of a material, it is necessary to establish a definite time and condition of measurement to establish a reasonably accurate standard of measurement

4th. Peculiarities of lumber. Since wood fiber is peculiarly susceptible to the effects of seasoning and moisture content these factors are responsible for large volume fluctuations in the same piece containing the same amount of valuable wood fiber content. It is, therefore much more Important In the standardization of lumber than in most other commodities to find a natural condition when actual fiber content bears a substantially fixed proportionate relationship to tangible volume.

5th. Practical time for measurement of lumber. Since careful investigations of scientists. as well as the practical experience of manufacturers, clearly indicate that the actual valuable fiber content of a given species of wood, which has not been subject to special artificial treatment is most nearly uniformly proportionate to its actual volume when the material is green and since in the process of manufacturing lumber such a condition in lumber does prevail at the time the saws are spaced for the first cutting of logs into timbers. scantling and boards, this seems to be the most practical time for measurement.

6th. Economic principles Involved. Since fundamental economic law requires that in order for any industry to continue to exist, it is essential that the ultimate consumer shall pay the coat of the raw material required in manufacture plus the cost of manufacture and distribution, and since the only time when raw material can be measured or estimated with any practically uniform degree of accuracy, is at the the of the first sawing from the log, measurement in the rough green at the first sawing seems to be the most practical method of establishing a standard of lumber measure that can be uniformly and justly enforced.

7th. A conclusion. In view of the observations hereinbefore enumerated, the committee, after long investigation and much discussion, has come to the conclusion that the fairest and most practical state for standard measurement of lumber is in the rough green condition. In consequence. all of its recommendations are based on this fundamental assumption.

8th. Loss of volume as a result of manufacturing process and seasoning. The research of the Forest Products Laboratory seems to indicate that it is reasonably certain that lumber cut full 1 inch in–the green can be surfaced one or two sides and seasoned to 16 percent moisture content and with careful economical manufacturing methods, produce boards $\frac{13}{16}$-inch in thickness. Manufacturers, however, insist that accidents of sawing produce too large a percentage of under $\frac{13}{16}$-inch to make $\frac{13}{16}$-inch the practical *minimum thickness* for the "standard," surfaced one or two sides seasoned board cut from "standard" 1-inch green stock. Therefore, after much discussion the committee has come to an agreement on $\frac{25}{32}$-inch as the minimum thickness that can be required to be delivered in seasoned material surfaced one or two sides produced from "standard" 1-inch rough green stock.

9th. Nominal surface dimensions to be standard measure for material required to be cut from less than 1-inch green stock. Practical requirement. of consumption dictate the necessity of manufacturing lumber in various finished items of a thickness less than the $\frac{25}{32}$-inch minimum standard board. but, since these requirements are met in practical manufacture by the resawing of seasoned stock from standard 1-inch or thicker original stock or from fall-downs from 1-inch lumber, and, since the opinion of practical retailers and consumers is opposed to the use of the fractional measurement. which would result if this material were reckoned by volume and carried back to original standard measurement in the green; therefore the committee concluded that nominal surface measure would form the most practical method of measurement for all resawed and substandard green stock. In consequence all of its recommendations are based on the assumption that nominal surface measure shall be the method of measurement for the material described in this paragraph.

HENRY ERICKSON,

General Contractor representing Associated General Contractors of America.

JOHN FOLEY,

Forester, Pennsylvania System, representing American Railway Association.

EMERY STANFORD HALL,

Architect representing American Institute of Architects, Chairman of Practical Size Investigating Committee.

Appendix E

BRIEF HISTORY OF LUMBER STANDARDIZATION

(Extracted from Simplified Practice Recommendation No. 16
dated July 1, 1924)

The problems of simplification of sizes, nomenclature, grades, and trade practices have been before the lumber industry for many years and it has long been recognized that, even though cut from different species, lumber of similar characteristics and intended for similar purposes could be produced, merchandized, and applied in accordance with fixed standards. More recently many have urged that the wide variation in regional practices as to size, grading, and names have reacted to the disadvantage of the user, retailer, wholesaler, manufacturer, and indeed, all groups interested in lumber, and that sane standardization offered promise of increased economy, more profitable and stable business, and markedly better service.

The constructive advance to solution may be dated from the convention of the American Lumber Congress in 1919, when an organized program was adopted looking to the simplification of lumber-grading standards, greater uniformity in the basis of similar grades of competing species, and the standardization of sizes of yard and factory lumber. A sound basis was at hand in the work of the Forest Products Laboratory of the United States Department of Agriculture, which has been studying, investigating, and urging national lumber standardization for many years. Progress, though continuous, was somewhat slow during 1920 and 1921, but early in 1922 Mr. Hoover, as Secretary of Commerce, responded to the request of the industry with suggestions for hastening results and an offer of cooperation in activities along definite lines. These were to be specifically directed to realizing the proposals for simplification and standardization and to development of more adequate quality guaranties to the lumber-using public.

As a consequence of the efforts of the Secretary of Commerce and the discussions which took place at various meetings, a general conference of 110 representatives of all interests was held in Washington during the last week of May 1922, under the auspices of the Division of Simplified Practice. Working through subcommittees, the conference developed unanimous resolutions of the industry to go forward in the formulation and adoption of the necessary standards in sizes and grades and methods of interpreting, enforcing, and applying these standards.

The plan was worked out in more detail at the second general conference in Chicago in July 1922, attended by representatives of over 110 organizations of all interests. A central committee was formed to act as an executive steering organization in drafting concrete recommendations and submitting these to the constituent associations. This committee at once proceeded to the organization of a larger group which they named the Consulting Committee

on Lumber Standards, members being appointed from all interests to work out the detailed data and appropriate recommendations. The two committees held eight meetings during the period between July 1922, and December 1923, the sessions of each continuing two or three days. A considerable number of nonmembers attended one or more of these meetings to discuss special points, and all in all the industry gave a most thorough-going consideration to the matters finally embodied in the recommendations submitted at the third general conference held at the Department of Commerce in December 1923.

SUMMARY OF THIRD GENERAL LUMBER CONFERENCE

One hundred and sixty-eight representatives of all lumber interests, manufacturers, distributers, and consumers, including the various Government groups, as well as architects, engineers, and other technical experts, assembled at the Department of Commerce December 12 and 13, 1923, to consider the report of the Central Committee.

Secretary Hoover opened the first session with a brief resume' of the industry's efforts toward standardization and outlined the cooperative position of the Department. Col. W. B. Greeley, representing Secretary Wallace, indorsed the movement for the Department of Agriculture and commented on the cordial cooperation of the industry with the Forest Products Laboratory in working through to the recommended standards.

Upon completion of the roll call, John W. Blodgett presented the recommendations of the Central Committee, calling upon various members to give detailed explanations of the basis and meaning of particular sections.

Procedure for the adoption of the report by sections having been established, the presiding chairman read sections 1 to 13, inclusive, which were unanimously adopted without change. The reading of section 14, however, at once developed the major point of difference between certain groups, namely, the proper basis for board measure and the related minimum thickness of the nominal 1-inch board. The technical finding of the Forest Products Laboratory that theoretically the most desirable thickness of dressed 1-inch boards is 26/32 of an inch was urged as the only feasible basis, althoughthe representatives of the Laboratory were in entire accord with the establishment of 25/32 inch S1S or 2S as a trial minimum standard, this being the Central Committee's recommendation.

Strong proponents of both views entered the debate, and after many futile attempts to reconcile the diverse trends of thought and opinion, through a solution agreeable to the contending groups, Secretary Hoover suggested that a committee of five manufacturers and five retailers confer with him during the evening to evolve, if possible, a satisfactory line of advance. The evening's deliberations resulted in a recommendation recognizing 25/32 inch S1S or 2S as the "standard size" and 13/16 inch S1S or 2S as the "extra standard size" for 1-inch boards, with the 1-inch rough green board the basis of board measure; also 1-5/8 inch S1S or 2S as the "standard size" and 1-3/4 inch S1S or 2S as the "extra standard size" of 2-inch boards and dimension. The proposal when presented to the general conference the following morning secured unanimous approval.

The conference closed with a summary of accomplishment and congratulations from Secretary Hoover and brief pledges of support from spokesmen of the several interests. Among these perhaps one of the most impressive was the resolution now on file in the Department offered by 26 retail lumber organizations representing all parts of the country and indorsing the standards for yard boards and dimension in the interests of progress.

This consummated cooperation of all lumber groups attains two great objectives:

First, by the elimination of unnecessary and often wasteful sizes, the number of actual finished yard lumber items has been reduced nearly 60 percent, and by fixing definitions of basic grades a firm foundation has been established for grade equalization. Such simplification of business practice means economies of great magnitude.

Second, and even more important, through the operations of the recommendations, the home builders of America are assured the production of standard lumber and standard products maintained by the united force of the industry.

The conference made full provision for consideration of the remaining details necessary to completion of the lumber standardization undertaking.

The lumber industry thus has set a precedent for other basic industries and has established a method of procedure which it is confidently expected will prove a most important business facility and an immensely powerful ethical control in our developing commercial structure.

Amendix F

"STANDARD LUMBER NOW ASSURED"

General Conference Brings
Manufacturers and Retailers Together on
Basis of Co–operation.

By Adolph Pfund, Secretary–Manager
National Retail Lumber Dealers Association

"The General Lumber Standardization Conference held at Washington, D.C. on April 27, 1926, will go down into history as a momentous occasion in the annals of the lumber industry, for the reason that it witnessed a coming together of producers and retailers on a basis of co–operation such as has never before existed since the lumber business began some sixty or seventy years ago."

'More progress was made by this General Lumber Standardization Conference for completing the major portions of the American Lumber Standards than the most optimistic in the industry had thought possible. Such important subjects as Shipping Weights, Short Lengths and Determination of a Single Standard, (in place of the present dual standard), were among the uncompleted chapters in the American Lumber Standards confronting the General Conference."

****

'The great forward strides registered by the General Standardization Conference on the following day, April **27,** were made possible largely by the preliminary conference of producers and retailers on the day prior. Briefly, we refer particularly to the settlement of the standard of thickness question, by giving the industry a single standard of 25/32 and 1–5/8 inch for yard lumber and yet retaining 13/16 and 1–3/4 inch as regular (not special) sizes in the American Lumber Standards procurable by dealers under the designation of Industrial Standard lumber."

"Short Lengths and Shipping Weights"

"Second, we refer to the settlement of the short lengths controversy by writing into the American Lumber Standards that the marketing practice of producers shall permit the dealer to secure specified lengths. Dealers will make every effort to handle their part of the bargain in disposing of short lengths and producers will not include shorts except as called for in the grading rules. The practice of refusal to ship specified lengths will cease. Mills will ship specified lengths, when ordered, or specified assortments of lengths, whatever combination of lengths may be desired. By a year from now we will know how well both sides have lived up to the bargain."

Excerpts from an article which appeared in the May 1926 issue of the "National Retail Lumber Dealer," the journal of the National Retail Lumber Dealers

REVISIONS AND PROPOSED ADDITIONS

TO THE

AMERICAN LUMBER STANDARDS

SOFTWOOD LUMBER

AS REPORTED

TO THE

UNITED STATES DEPARTMENT OF COMMERCE

BY THE

CENTRAL COMMITTEE ON LUMBER STANDARDS

Washington, D. C.

APRIL 3, 1928

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ARTHUR T. UPSON — Secretary
Washington, D. C.

Advisory:

FOREST PRODUCTS LABORATORY
Forest Service,
Department of Agriculture

DIVISION SIMPLJFIED PRACTICE,
Bureau of Standards,
Department of Commerce

REVISIONS AND PROPOSED ADDITIONS

TO THE

AMERICAN LUMBER STANDARDS

SOFTWOOD LUMBER

AS REPORTED TO SECRETARY OF COMMERCE

BY THE

CENTRAL COMMITTEE ON LUMBER STANDARDS

WASHINGTON, D. C., APRIL 3, 1928.

Since the sixth General Conference of Lumber Producers, Distributors and Consumers, held by the Department of Commerce, April 27, 1926, at which time revised recommended American Standards for Softwood Lumber were established, work, by the lumber industry through its organized Standardization Committees, of completing these standards and bringing them up to date has steadily progressed; and the Central Committee on Lumber Standards has approved and now recommends to the U. S. Department of Commerce certain revisions in and additions to the American Lumber Standards for Softwood Lumber.

In accordance therewith, a General Conference of Lumber Producers, Distributors and Consumers has been called by the Secretary of Commerce for May 3, 1928, in Washington, D. C., to take action upon these recommendations.

The proposals hereinafter enumerated are amendatory of or supplementary to those approved in General Conferences on December 12 and 13, 1923, April 22, 1924, May 1, 1925, and April 27, 1926, respectively, of representatives of Producers, Distributors and Consumers of lumber, and by the Secretary of Commerce as published in Simplified Practice Recommendation No. 16, issued by the Bureau of Standards, Department of Commerce, effective from July 1, 1926, and pertain to the following:

1. Nomenclature of Commercial Softwoods.
2. Definition of Edge Grain.
3. Substitution of Dryness of Lumber for Shipping Weights as a Basis for Measurement of Standard Lumber Sizes.
4. Classes of Lumber Dryness.
5. Clarification of Table of Sizes of Lumber Worked to Pattern
6. Uniform Patterns for Worked Lumber.
7. Shingles.
8. Basis for Measurement of Dryness of Factory Lumber.
9. Other Subjects for Discussion by the Conference.

Accompanying each revision or addition enumerated below are explanatory statements of the Central Committee on Lumber Standards in justification of its recommendations. The section numbers, or subdivision headings, quoted refer to those contained in Simplified Practice Recommendation No. 16, dated July 1, 1926.

Following the nine specific subjects upon which the Central Committee makes specific recommendation, are listed several standardization topics of more than ordinary importance, for general discussion by the Conference. Other matters pertaining to the Softwood Standards, not contained in this Program, may also be discussed or presented for the action of the Conference.

Recommendation No. 1—Nomenclature:

Section 7 and Appendix A: Since the establishment of the current American Standard nomenclature for commercial softwoods, changes have occurred in certain Standard botanical names and in groupings of similar species in commercial practice. **The Central Committee on Lumber Standards recommends that the present commercial nomenclature be revised and amplified accordingly. Names now appearing in Appendix A (Page 26), requiring revision, are as follows:**

Present Standard Commercial Name	Present Standard Botanical Name	Recommended Standard Botanical Name
Eastern Hemlock	Tsuga canadensis	Tsuga canadensis and Tsuga caroliniana (Carolina hemlock)
Pond Pine	Pinus serotina	Pinus rigida serotina
Jack Pine	Pinus divaricata	Pinus banksiana
Eastern Red Cedar	Juniperus virginiana	Juniperus virginiana Juniperus lucayana (southern red cedar), and Juniperus mexicana (mountain juniper)

Commercial softwoods recommended added to the American Standards are as follows:

Recommended Standard Botanical Name	Recommended Standard Commercial Name
Western Juniper	Juniperus utahensis (Utah juniper) Juniperus pachyphloea (alligator juniper) and Juniperus scopulorum (Rocky Mt. red cedar) Juniperus occidentalis (western juniper)
Pacific Yew	Taxus brevifolia

Recommendation No. 2—Edge Grain:

Section 21: By the American Standards the word "vertical", where used to describe the relationship between the rings of annual growth and the surface of the piece, is defined as an angle of 45 degrees or more, whereas by the dictionary "vertical" is defined as perpendicular or upright, namely 90 degrees. On the other hand lumber in which the rings form an angle of 45 degrees or more with the surface has long and rightly been classified with that with rings approaching a 90 degree angle. To avoid confusion in terms, therefore, and to eliminate all possibility of misconception in legal rulings, the lumber industry should provide itself with a Standard but descriptive term of its own coinage and definition. A purely lumber phrase, descriptive, quite extensively used at present, and more or less well established by custom, is the term "Edge Grain.''

The Central Committee recommends that the term "Edge Grain" be substituted for the term "Vertical Grain" in this section of the Standards.

Recommendation No. 3—Basis for Measurement of Sizes:

The present American Standards provide, in Sections 24 to 27 inclusive and 33, that for use in determining thickness and width of Standard lumber the commercially dry shipping weights of the regional associations of manufacturers, issued after approval by the Central Committee on Lumber Standards and in effect when shipment is made, shall be employed. This provision was adopted at the General Conference on December 12 and 13, 1923, and has been discussed at each succeeding Conference.

At the Conference, April 27, 1926, representatives of the lumber retail dealers presented a resolution which, after considerable discussion and some amendment, was unanimously adopted. It stated that the Consulting Committee on Lumber Standards was of the conviction that the consumer is entitled to lumber in a condition for commercial use and that it considered an approach to the solution of the question was, at that time as regards Yard lumber, represented by completing the stipulations called for in Section 33 of the American Lumber Standards; and by this resolution the Consulting Committee requested the Central Committee on Lumber Standards to ask prompt compliance by the regional associations in supplying commercially dry shipping weights for the approval of the Central Committee; and that upon such approval, such weights should become effective at once upon publication as part of the American Lumber Standards. By amendment adopted, the last provision of this resolution provided that before approval a scientific study by a Sub-Committee of the Consulting Committee should be made, and by a second amendment that a suitable committee be appointed by the Central Committee to continue the investigations of practicable methods of improving the seasoning and uniformity of dryness of lumber when delivered to lumber consumers.

As instructed by this resolution, the Central Committee called upon the regional associations of manufacturers to supply their commercially dry shipping weights, and appointed a Sub-committee consisting of a chairman and two representatives of lumber retailers, two of lumber manufacturers, one of architects and contractors, one of box manufacturers, one of railroads and engineers, and one of millwork manufacturers, to study and report on both subjects assigned by the Conference.

This Sub-Committee of the Central Committee on Lumber Standards, working in full cooperation with the U. S. Forest Products Laboratory, has spent nearly two years in study of these questions. In taking up its study of association shipping weights furnished the Central Committee, it found that at least in three instances association shipping weights had been compiled solely for the purpose of guaranteed costs of lumber delivered at destination, and were not and could not be used as a basis for determining whether or not lumber

was of American Standard thickness and width, and were not so furnished the Central Committee. Coincident with this, the Sub-Committee secured the results of studies by the Forest Products Laboratory of variation that might be expected between shipments of lumber otherwise of the same species and shipping weights. These showed that in some species, due to variation in density of the wood, shipments of the same actual weight might vary in dryness from a few per cent moisture content to as high as 28 per cent.

In view of the fact that at least three associations did not recommend their commercially dry shipping weights for the purpose intended by Section 33, and in light of the great variation in density and hence lumber weights, the Sub-committee rightfully concluded that shipping weights were far from a practicable basis to employ in measuring lumber for compliance with the rough and dressed sizes provided in the Standards. It therefore proceeded to consider and devise improved means for this purpose.

During this two-year period, the Forest Products Laboratory conducted in cooperation with lumber manufacturers and consumers extensive technical studies of (1) the dryness of lumber as shipped from sawmills, including the major commercial softwoods produced at typical large mills in California Redwood, California White and Sugar Pine, Southern Pine, West Coast and Western Pine regions; (2) average shrinkage in drying; (3) amount of change in dryness of lumber in transit; (4) practicable methods for measuring lumber dryness; and (5) to a lesser extent, the dryness of lumber in use. The studies of the dryness of lumber as shipped involved over 20,000 moisture determinations of over 400 representative shipments of lumber. Tests were made upon both air-dried and kiln-dried lumber. The work was done with a single exception during the winter season. The data were analyzed by the Laboratory with special reference to the average moisture content of the individual shipments or lots and to the degree of uniformity of, or range in, moisture content among the different boards in each shipment.

At the same time the Central Committee, at the request of the Sub-Committee, called upon the various branches of the industry to furnish all available technical data on the practicability of shipping weights as an indicator of lumber dryness, air seasoning and kiln drying practices and their results, the custom in regard to the shipment of lumber of specified dryness, etc., etc.

These comprehensive technical data, supplemented by practical information obtained from the industry, brought out the following pertinent facts :

That both in kiln-dried lumber and in air-dried lumber the degree of dryness attained in seasoning as practiced by the best mills is practically uniform in each class of lumber, i. e., Select, Common, and Factory, irrespective of species and regions;

That both in kiln-dried lumber and in air-dried lumber the range ‘of moisture content attained by such seasoning practice in shipments of the same degree of dryness is practically uniform in each class, irrespective of species and regions ;

That the bulk of winter air-dried lumber, whether it be Select, Common, or Shop, had an average moisture content of between 15 and 24%;

That the bulk of kiln-dried Common lumber, also, had an average moisture content between 15 and 24%;

That the bulk of kiln-dried Select lumber had an average moisture content of from 10 to 15%.

In the light of these data, the Sub-committee formulated and recommended to the Consulting Committee, which subsequently approved and recommended to the Central Committee, and the Central Committee now so recommends to the General Conference, with respect to an improved basis for measurement of Standard lumber sizes, the following revisions in the American Standards for Softwood Yard lumber:

Section 33: That the title to this section be changed from “Shipping Weights” to “Basis for Measurement of Lumber Sizes”; that it be transposed to immediately following Section 30, be numbered Section 31, and present Sections 31 and 32 be renumbered accordingly; and that the following be substituted for present Section 33:

> “31. The dressed dimensions specified in Section 27 shall be minimum dimensions when measured as of a moisture content of 20 per cent for Common lumber, and of 14 per cent for Select lumber, including all grades developed in working of Select lumber.”

Sections 24, 25, and 26: That the expressions “(measured at standard commercially dry shipping weight and moisture content for each species)” and “(based on kiln-dried lumber)”, wherever they appear in these Sections, be amended to read “(measured as specified in Section 31)”.

Section 27: That the heading “Dressed Dimensions at standard commercially dry shipping weight and moisture content” in the headings of the tables in this section, Pages 6, 7, and 8, be amended to read “Dressed Dimensions”; and that Footnote 1 on page 6 and the figures “1” in the last column to which the footnote refers, be eliminated.

Section 30: That the words “rough and commercially dry” and the words “rough and kiln-dried” be eliminated; and the words “rough dry“ be inserted before the word “finish” in lines 1 and 3, and before the words “common boards” in line 7.

Section 41: That the words "at standard commercially dry shipping weight and moisture content" in the heading of the table in this section, Page 10, be eliminated; and that for the expressions in the footnote to this table "at standard commercially dry shipping weight and moisture content" (lines 2, 6, and 8), and "based on kiln-dried lumber" (line 3), and "commercially dry" (ling 9) be amended to read "measured as specified in Section 31".

The Central Committee also **recommends,** upon advice of the, Sub-Commitee and the Consulting Committee, that to cover the measurement of structural material a new section be added under **"2. GENERAL PROVISIONS" of Division IV. "STRUCTURAL MATERIAL", of Bulletin 16, to read as follows:**

"The dressed dimensions specified in Sections 83, 91, and 98 shall be minimum dimensions when measured as of a moisture content of 24%.

Recommendation No. 4—Lumber Dryness:

Upon recommendation of the, Sub-committee and the Consulting Committee, the Central Committee on Lumber Standards **recommends to the General Conference that upon the basis of the results of technical studies of the degree of dryness attained in seasoning as practiced by the best mills, there be established standard definitions for the use of the trade in describing the various degrees of lumber dryness, to be inserted as a new sub-division immediately following Section 22 of the American Standards, and the succeeding sections renumbered accordingly, as follows:**

Classes of Lumber Dryness

23. The different degrees of dryness of Yard lumber shall be defined as follows:

(a) Green Lumber — Lumber having an average moisture content in excess of 24%.

(b) Shipping Dry Lumber — Lumber having an average moisture content of from 15% to and including 24%.

(c) Commercially Dry Lumber — Lumber having an average moisture content of 15% or less.

Note: For the information of the Conference, the Central Committee on Lumber Standards advises that the Forest Products Laboratory has devised simplified instruments, and at least one lumber manufacturer a piece of mill equipment, for the rapid determination of the moisture content of lumber of practical use in putting the above recommendations into commercial application. In addition, a table of shrinkage values can be compiled for use in determining whether lumber of any moisture content is of American Standard size.

The scientific studies have also proven that moisture determination on not to exceed 20 samples from any shipment or lot of lumber will establish for all practical purposes the average moisture content of that shipment or lot. Pending perfection and universal adoption or the newly devised moisture content measuring devices, the use of the present oven and scales method is entirely feasible when only 20 moisture content determinations are required.

Appendix H

(Source: Southern Pine Assn.)

Attitude of Department of Justice

In the latter part of 1941 and early 1942, there were several exchanges of correspondence as well as a number of conferences between Mr. Tom C. Clark, who was in charge of the Anti–Trust Division of the Department of Justice, and a small committee representing the producing regions that were undertaking this revision of the American Lumber Standards to meet the requirements of the National Lumber Manufacturers Association and other lumber industry consent decrees. From the outset, Mr. Clark took the position that the revision of the American Lumber Standards should include specific requirements with respect to moisture content at which the American Lumber Standards sizes apply. There was some argument back and forth on the subject, but in a letter to Dr. Wilson Compton of the NLMA, dated March 2, 1942, Mr. Clark stated

> "As to paragraph 7, you know my opinion of the seasoning requirements. Seasoning is either good or bad. If it is good, we should make all lumber associations enforce it; if it is bad, we should take it out of the requirements of all of them. To make manufacturers of Southern Pine season their lumber, while at the same time to permit manufacturers of Douglas Fir to sell green, gives an unfair advantage in my opinion."

Further conferences and a prospective meeting in the fall of 1942 caused the NLMA to address a circular to all agencies publishing grading rules, outlining the latest developments and the three remaining points that must be satisfactorily handled in order to meet the views of the Department of Justice. Point one relatedto the identification and publication of approved grading rules. Point two had to do with grade–marking requirements. Point three was on lumber seasoning, and in this connection it was stated

> "The position of the Department will necessitate
>
> "First, that in grading rules published by any agency the definitions of seasoning and drying standards are to be clear and specific.
>
> "Second, that if lumber of sizes for which seasoning specifications are to be provided, is to be graded, marked, and sold as American Standard but is to be marked and shipped green, it must be finished over–size in both width and thickness by an amount to be shown in the grading rules approved by the Lumber Standards Authority as reasonably assuring that the lumber will be not less than the minimum standard dimensions when seasoned."

In view of the discussions of seasoning requirements, oversized provisions, etc., the West Coast Bureau of Grades gave consideration to this at a meeting in September 1942, and Col. W. B. Greeley as manager of the Bureau wrote to the NLMA under date of September 15 that the following action had been taken.

> "That the Bureau should continue to support American Lumber Standards and join with other lumber groups in working out the most favorable adjustment obtainable from the Department of Justice. If oversizing of Green Dimension is necessary, the averages should be kept as small as possible. 1/16" in thickness, 1/8" in 4" and 6" widths, and 1/4" in greater widths are regarded as adequate."

It is understood that prior to and during the early part of World War II, the West Coast mills that shipped green lumber customarily dressed it oversized so as to allow for shrinkage. As the war progressed this practice was abandoned, and since then all of the production both dry and green has been dressed to the standard finished sizes established under the grading rules.

By November 1942, it was quite clear that war pressures would make it impossible for the lumber industry to continue this effort to revise the ALS, and the Department of Justice concurred in the request that the matter be held in abeyance until the termination of the war. In a letter to Mr. Clark, dated November 30, summarizing the accomplishments to date, the small committee representing all of the manufacturers' groups, composed of Messrs. Wilson Compton, Col. W. B. Greeley and A. S. Boisfontaine, stated

'In further support of this request, we are glad to advise you that the agencies of the industry which have participated in the consideration of these matters, are prepared in substantial respects to meet the views of the Department as set forth in our last conference with you in May 1942.

"Recent discussions of the Manufacturers Committee indicate that a revision can be worked out along these lines:

> "1. Grade marks approved by the Authority will designate lumber of standard sizes. Lumber of less than standard size will be unmarked or have some distinctive marking.
>
> "2. Standard sizes will apply in the customary markets of the species. Grading agencies whose rules include provisions applicable to the shipment of green lumber will provide that such lumber be sufficiently over-sized to conform with the standards upon arrival in customary markets.*

When this activity was resumed in the summer of 1946, the West Coast region seemed inclined to retract from the position agreed to in 1942, but the feeling prevailed that nothing less than this would satisfy the Department of Justice. In a letter dated October 14, 1946, written to Mr. Wendell Barge who had become head of the Anti–Trust Division of the Department of Justice, the NLMA reported:

> "On the question of seasoning, the industry still feels that it must stand on the principles stated in the memorandum of February 13, 1942, although we believe the ideas as expressed by Mr. Clark in conference and by letter are fully met through the provisions proposed under paragraph 122 of the enclosed revision. It will be noted that these require grading rules to include specific definitions as to the green or seasoned condition of the lumber shipped under such rules and that the Lumber Standards Authority is authorized to pass on these definitions both as to clearness and as to adequacy. Further, theprinciple is recognized that lumber identified as American Standard shall meet American Standard sizes in its usual and customary markets, and it will be required that specific provisions to carry out this principle be included in all grading rules."

At that time, all of the participants understood that the "specific provisions to carry out this principle" in grading rules would be either maximum moisture content limitations, or definite requirements for dressing lumber over–size if shipped green. Later, at the request of the West Coast Lumbermen's Association, the ALS paragraph on seasoning was amended to include the underlined clause in the following present paragraph VF2 of the ALS:

> "Approval of an agency's rules by the Board of Review should require that lumber identified as American Standard, whether shipped green or seasoned, <u>which is to be used where accuracy of size is a prime consideration</u> shall meet American Standard sizes in its usual and customary markets."

This evidently was proposed with the idea that the requirement would not apply to common boards and dimension, although there was never any agreement among the participants that this was the intent of the provision, or the way in which it should be interpreted. The present controversy over sizes, involving the FHA and government purchases, definitely indicates that accuracy of size is an important consideration even in the common items.

Appendix I

MINUTES OF MEETING

AMERICAN LUMBER STANDARDS COMMITTEE

SHERATON BLACKSTONE HOTEL

CHICAGO,ILLINOIS

A meeting of the American Lumber Standards Committee was held pursuant to call at the Sheraton Blackstone Hotel, Chicago, Illinois, at 10:00 A.M., April 30, 1956.

Present were the following:

GROUP "A," Representatives of agencies formulating, publishing and maintaining grading rules and inspection services--

H.B. JAMISON and S. V. FULLAWAY (Alternate)
J.K. HERNDON and A.S. BOISFONTAINE (Alternate)
R.E. BRODERICK (Alternate)
S.J. SHARP
L.N. REICHMANN and H.V. SIMPSON (Alternate)
H.S. CROSBY

This represented six of the eight members in this group.

GROUP "B." Representatives of other agencies and groups--

J.M. ALEXANDER
W.A. OLIVER (Alternate)
J.M. JARVIS
D. HINCKLEY
O.G. WILBUR (Alternate)
DON CAMPBELL
E.W.DONAHUE
H.J. LEAF and H.W. MURPHY (Alternate)

This represented eight of the nine members and hence a quorum of the group.

The Secretary advised the Chairman that a quorum was present.

Others present were Messrs. Price, Johnson, Cahal, Noland, and Carr.

Mr. Alexander acted as Chairman and Mr. Carr as secretary.

The minutes of the previous meeting were approved without objection.

In response to a letter from the Federal Housing Administration, requesting advice on the moisture content at which standard sizes apply and allowable tolerances therefrom for drying, it was moved, seconded, and carried that the Secretary advise the F.H.A. that the committee recognizes the problem and will work to the end of relating sizes to a specific moisture content along the lines of Interim Federal Specification MM–L–00751d(GSA–FSS) for Softwood Lumber and Timber, dated July 15, 1955.

It was moved and seconded that the Committee recommend to the Department of Commerce that SPR–16 be revised in the following respects:

1. Establishment of 3/4" as the dry (19 percent for common, 15 percent for finish) minimum dressed thickness for all 1" items now required to be 25/32", with customary 1/32" differential maintained for patterned items including siding.

2. Corresponding reduction in roughdry sizes.

3. Reduction of 1/32" in thickness of standard industrial board.

It was moved, seconded, and carried, that the motion be amended to strike out the following from the previous motion (dry 19 percent for common, 15 percent for finish).

The motion as amended was then carried.

It was moved, Seconded, and carried that areduction of 1/8" in the 8", 10", and 12" dressed widths of 2" and thicker worked lumber, when shiplapped and for splines be recommended to the Department of Commerce.

It was moved and seconded that the Committee recommend to the Department of Commerce the re–establishment of minimum dressed width 3/8" scant of nominal for 6" and 7" boards and dimension.

The motion was defeated.

It was moved, seconded, and carried, that the committee shall establish appropriate max–imum moisture contents at which minimum sizes would apply.

The Chairman then appointed a committee to study the problem of relating moisture contents to sizes and asked that they make recommendations for consideration of the Committee as a whole at the earliest possible date.

The committee appointed was as follows:

MR. MURPHY, Chairman
MR. HERNDON
MR. JARVIS
MR. OLIVER
MR. REICHMANN

There being no further business to come before the meeting, the meeting was adjourned.

J.H. Carr, Jr., Secretary

Appendix J

FEDERAL HOUSING ADMINISTRATION

Washington 25, D.C.

FOR RELEASE FRIDAY
MAY 18, 1956

FHA 56-21
EX 3-4160 EXT 4693

How thick should a one inch board be? FHA looks to industry to set standards upon which it bases its construction requirements, states Federal Housing Commissioner Norman P. Mason. This principal applied as equally to plumbing supplies, for example, as to lumber and other building items, he said.

Recent differences within the lumber industry over the acceptable thickness of boards reportedly created a flurry of confusion among builders trying to meet FHA requirements.

The issue in question, the standardto be applied to the dressed thickness of nominal one inch board lumber, is one for the industry to resolve, Commissioner Mason asserted.

However, he said, FHA is being pressed to set a firm standard, and if industry does not settle the issue within a reasonable time FHA will be required to act.

Since 1924 the minimum dressed thickness of nominal one inch boards has been 25/32 of an inch in accordance with American Lumber Standards. On March 15 the West Coast Lumber Inspection Bureau issued new grading rules and reduced the dressed thickness of so-called one inch boards produced by members of the West Coast Lumber Association to 3/4 inch.

For a brief time thereafter the thinner boards shipped by West Coast Lumber producers presented a problem to FHA inspectors. Although traditionally FHA's requirements have abided by standards set by the lumber industry as a whole, as represented by the American Lumber Standards Committee, Mr. Mason modified the rules temporarily to permit acceptance of 3/4 inch boards.

The 16-member American Lumber Standards Committee met in Chicago April 30 and voted to recommend to the U.S. Department of Commerce that 3/4 inch dressed thickness be the new ALS standard. The Commerce Department, when it receives the recommendation, will circularize the lumber, construction and consumer fields seeking ratification of the new standard before taking a position.

Mr. Mason pointed out that because the Commerce Department desires widespread approval of all people affected by lumber sizes before it approves a change in standards, this phase of the matter is necessarily a time consuming one.

Hoping, however, the lumber industry will be able to resolve the problem soon, Commissioner Mason has announced that FHA will extend the period of its acceptance of 3/4 inch boards.

Mr. Mason pointed out that the question is really a basic one. In general it is his belief that industry wishes to establish its own benchmarks. This is true of the whole range of building supplies from portland cement to heating equipment.

"A further matter," he said "touched on by the ALS Committee but not as yet resolved, is the relationship of the moisture content to the finished size."

Appendix K

LOOKING AT WASHINGTON

Members of the wooden box industry will be interested in a proposed revision of softwood lumber standards now in the process of circulation for voluntary approval by lumber manufacturers and users and for subsequent publication as simplified practice recommendation R16-53, under sponsorship of the U. S. Department of Commerce.

The major revision applies to standard thickness of nominal one inch lumber. It was proposed that rough dried thickness of one inch lumber, now fixed at not less than 29/32". shall be reduced 1/32" to 28/32" except that 20 percent of a given shipment may not be less than 27/32". Under this revision, the finished thickness of nominal inch lumber is reduced from 25/32" to 3/4". Nominal one inch lumber run to pattern, such as rustic or drop siding, is reduced in thickness from 3/4" to 23/32".

Manufacturers of wooden boxes and other commercial lumber users who have regularly purchased quantities of one inch lumber may view the reduction of 1/32" as a penalty in the manufacture of resawn material.

Members of the Southeastern Box and Shook Manufacturers Association, meeting August 9, in Richmond, took action registering their opposition to the proposed reduction in standard thickness in nominal inch lumber.

National Wooden Box Association will supply, upon request, copies of the proposed revision. Lumber producers or users who wish to offer suggestions or to register opposition to the proposed revision may communicate with the Commodity Standards Division, Office of Technical Services. U. S. Department of Commerce. Washington 25, D. C.

Appendix L

Where is the Stopping Point? How Scant Should Lumber Be?

The furore aroused by the West Coast Lumbermen's Association in releasing its new Grading Rules, permitting 1" boards to be surfaced and shipped when green to 3/4", raises some unanswered questions.

The resulting discussion is reminiscent of the industry debate on the subject of standard sizes for Boards and Dimension which took place over thirty years ago. At that time, the General Standardization Conference, which ultimately became the Committee on Lumber Standards, established 26/32" as Extra Standard, and 25/32" as the Standard Size for Boards. 26/32" was then championed by eastern associations of retailers. Hundreds of speeches and thousands of words of printed matter were devoted to this subject. Eventually, the extra 13/16" Standard for Boards and 1 -3/4" for Dimension were forgotten.

Far Twenty-Five Years . . . .

For a quarter of a century, 25/32" has been the officially recognized American Lumber Standard for Boards and, as such, was incorporated in the Minimum Building Requirements of FHA.

As time went on, the rules as to standard thickness were honored quite as much in the breach as in their observance.

We are told that you can hardly distinguish between 25/32" and 3/4" Boards and, for many years, it has been said that you cannot distinguish between 3/4" and 11/16" stock.

It is interesting to note that the so-called "Extra Standard" for Dressed Boards and Finish of thirty years ago was based upon the published findings of the United States Forest Products Laboratory as the minimum justifiable standard. Yet until the FHA adopted the standard of 25/32" set by the industry, there has been little protest against the increasing competition of thinner sizes. Commissioner Mason was on solid ground when he told Congress that standards are needed on which to base building requirements. The FHA adopted the 25/32" Standard because the industry on the recommendation of the American Lumber Standards Committee had recommended it for adoption by the Department of Commerce.

The recent sudden meeting of the Standards Committee was occasioned by the action of the West Coast Lumbermen's Association

which released its new Grading Rules without consultation with its customers — the retailers

It is hard to understand why the WCLA would take time and trouble to meet with retail groups on numerous occasions when it was going through the process of changing its grades from numbers to names, and then adopt something sa important as the changing of lumber sizes without one consultation with its retail customers.

Where is the Stopping Point?

Where is the stopping point? What does a 3/4" thickness for Boards mean when they are dressed green?

A 4 percent tolerance is allowed for shrinkage and seasoning. How will this be enforced' Is any one going to check Boards with a pair of calipers to find out whether they are 3/4", 11/16", or 5/8" in thickness?

As we see it, there is only one answer to establishing a definite size and that is to establish the thickness of Boards either rough or dressed when dry

We predict that in the not too distant future a further recommendation will be made by the manufacturers that the size of 11/16" be adopted How far shall we go? Would not 5/8" be equally acceptable?

We heartily commend the recommendation of Don Campbell who single-handedly represented retail dealers at the recent meeting of the American Standards Committee when he said that "The problems connected with supplying the end-use purchaser deserve equal consideration with the production problems of the manufacturer If the lumber industry is to meet the competition of other materials It must give the consumers the goods they want in the sizes that suit their purposes"

We agree that Minimum Size Standards of Lumber should be established at once with sizes built upon scientific data for area use Standards should not be based solely upon production requirements. We are satisfied that retailers generally will cooperate and support any agency or organization in the industry or in Government which is based upon scientific evidence as to the consumer's needs

When all is said and done it seems evident that Lumber Standards cannot be based upon finished green sizes if they are to mean anything The same principles apply to Dimension Lumber which was not even touched in the recent discussion of the Standards Committee but will probably come to the front in the not too distant future.

Paul H Collier

GPO 812–841–3

Appendix M

Consumer Interest or Production Advantage?

By PAUL S. COLLIER

Claims and counter-claims of the advocates of a thinner standard for boards have befogged the real issue for the buying public

Several months ago we asked the question, "Where Is The Stopping Point? How Scant Should Lumber Be?"

That question has been partially answered by the recent action of the American Lumber Standards Committee, setting aside the recommendation adopted by a margin of one vote at the hurry-up meeting of the some Committee held last April. That recommendation called for the adoption of 3/4" thickness of boards surfaced and shipped green as the official standard to be established by the Deportment of Commerce.

As matters stand now, there will be no change in the present standard of 25/32" thickness. If perchance, 3/4" should be adopted, then this must mean 3/4" when dry. This is the position championed by forward-looking retailers, such as Chester T. Hubbell, former Northeastern President, now a member of the NRLDA Standards Committee.

For the Consumer's Best Interest

Last June we asked the question, "Where Is The Stopping Point?" Since that time we hove noted the appeals made to groups of wholesalers and retailers to promote the proposed 3/4" Green Standard so strongly championed by the leader of the West Coast Lumbermen's Association. We have previously commended the forward-looking actions taken by the West Coast Lumbermen's Association, such as their adoption of a grade marking program. We regret that in this instance we cannot agree with their position on this subject of the thickness standard for Boards. We do not believe that if this proposed standard were adapted the best interest of the consumer, or of the industry itself, would be served.

Therefore, we are not surprised that the Forest Products Laboratory, the United States Forest Service, and the Federal Housing Administration have entered their objections to this proposed lowering of standards. We have even heard it rumored that the Corps of Engineers will not purchase lumber on this standard of thickness.

We, Too, Oppose Any Lowering of Standards

We congratulate these objectors and hope that this stoplight will cause every firm in the industry, which has the opportunity, to vote "No" on Recommendation R16-53. We earnestly hope that the De-

partment of Commerce stands firm in refusing to endorse this lower standard.

The reason for the opposition to the standard recommended by one group of manufacturers is obvious; it has been stated before. A thickness of 3/4" without a limitation of maximum moisture content is meaningless. It can only mean that such boards when dry will probably measure 11/16" or less. The next inevitable step downward would naturally be a standard of 5/8" should this meaningless 3/4" green standard be ultimately adopted.

It is well that at last we ore facing fundamentals. It is high time, as a prominent Boston retailer said recently, that the industry call a halt to the constant push for lower and lower standards. We quote:

> "Year by year we watch the grades and standards of lumber progressively debased by the manufacturers. We have seen No. 1 Common mongrelized into a combination grade. We have seen the width of lumber dropped from 3/4" to 5/8" and now to 1/2". Every day we see an increasing number of sub-standard items being pushed into the market. The next step from 3/4" Board, of course, will be 11/16". It seems to me that those of us who are at the gross roots level, namely the retailers, should make a real effort to put the brakes on this downhill trend."

The Handwriting Is On the Wall

If the lumber manufacturing industry expects to hold its own against the competition of other materials, it must put the end-use problems of the consumer ahead of temporary expediency; it must serve the interest of the consumer rather than the production advantage of the manufacturer.

Unless we put the interest of the consumer first, it will be difficult to hold his loyalty to wood, the building material which has served him for generations. By courageously standing now for the best interest of the consumer, we con prove our industry worthy of his continuing confidence and support.

Appendix N

TS-5636

July 18, 1963

U.S. DEPARTMENT OF COMMERCE

AMERICAN LUMBER STANDARDS

The softwood lumber industry in the United States has adopted standards that were developed with the cooperation of the U. S. Department of Commerce. They are issued by the Department as Simplified Practice Recommendation 16-53. Recent questions on proposals for a revision of R 16-53 have made it desirable to give the following information on procedures for the cooperative development of these industry standards in order that they will be in the best interests of the industry and the public.

The 'Procedures of the Commodity Standards Division" as published by the Department are carefully followed. In accordance therewith, the Department receives proposals for voluntary Commercial Standards and simplified Practice Recommendations and circulates such proposals for voluntary acceptance. Any firm, organization or group may propose a standard of practice for consideration. If the proposal meets the Department's requirements, as specified in the procedures, it is circulated widely to the industry (which is broadly defined to include producers, distributors and users) with an opportunity for voluntary acceptances.

If a substantial and representative number of producers, distributors, and users accepts the proposal, and it is compatible with the public interest, the proposal is then promulgated by the Department of Commerce as a voluntary standard of practice. To keep such standards current, the Department encourages the establishment of committees, fairly representing the industry, which may propose revisions from time to time as the need arises. These committees are appointed from interested groups by mutual agreement. The Department does not establish the committees or appoint the members. The justification for the committees lies in their usefulness to industry and the consuming public. Under the Department's procedures, all proposals are given equal treatment, whether they come from the committees or from any other source.

The committee for the lumber standards is somewhat different. It is organized under a court-approved procedure as the American Lumber Standards Committee. The Department's relationship with the ALSC is defined by the consent decree and court orders growing out of an anti-trust action. Under this court-approved procedure, members of the ALSC are appointed by the Department of Commerce from certain listed elements of the lumber industry. Although this appointment procedure differs from the normal way in which committees are voluntarily established, it does not mean that the ALSC may revise the standards of practices issued by the Department under established commodity standards procedures. The Department will treat any proposal made by the ALSC as falling within these established procedures which require wide circulation and acceptance, just as it, does a proposal by any other group.

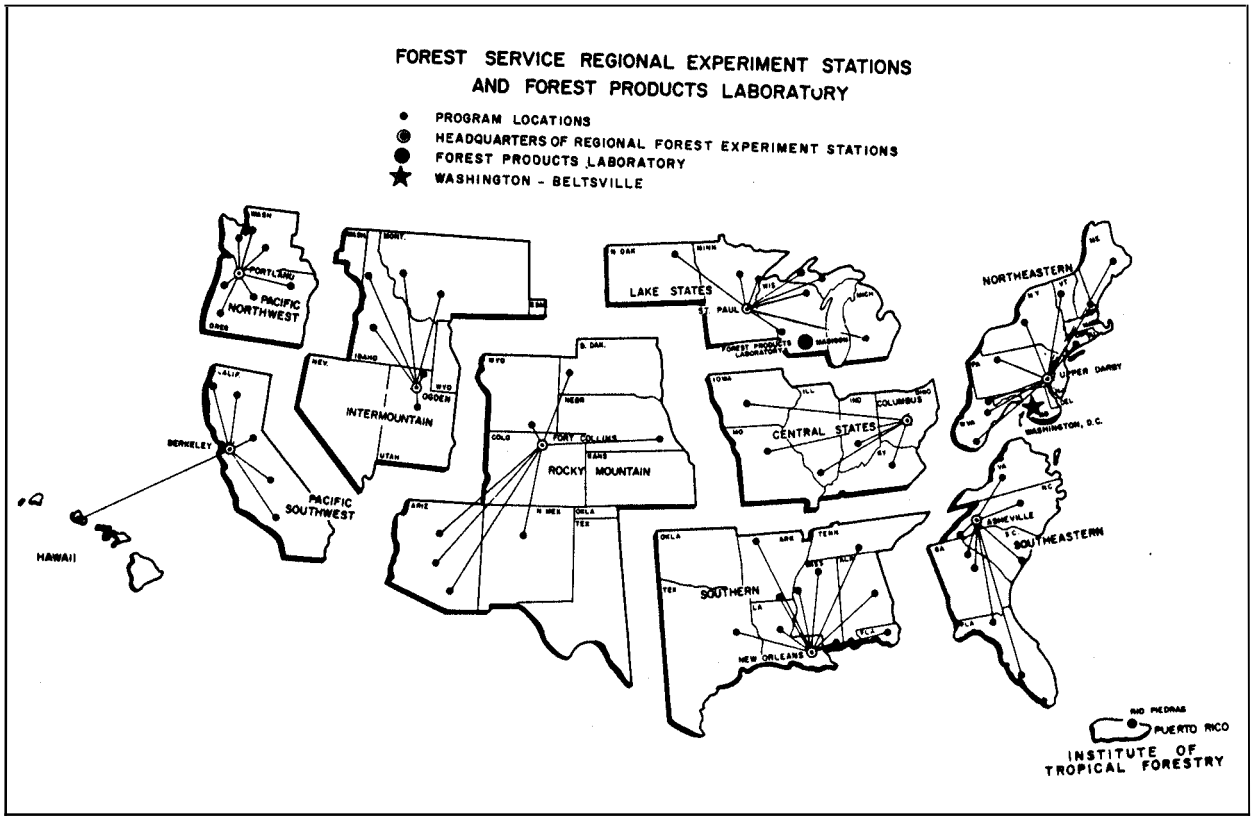
Thus, any recommendation of the ALSC to the Department for revising the Lumber Standards will first be reviewed by the Department and, if found suitable, the Department will give it wide circulation under the published procedures. The public interest is thereby protected by providing the broadest opportunity for interested firms or persons to accept or reject the proposal. In addition, the technical soundness of the proposed standard will be examined comprehensively by the Forest Products Laboratory of the U. S. Department of Agriculture or other appropriate technical agency.

Regarding the composition and tenure of the ALSC, that committee is being urged to work out acceptable procedures whereby the industry could appoint its own members rather than having the Department of Commerce do so. This would place the ALSC in the same position as all other voluntary standards committees.

A current list of acceptors of thelumber standards will be prepared at the appropriate time. It is considered that under the procedures being followed by the Department, once a proposed lumber standard is widely accepted by the industry, as well as being technically sound, such a standard will be beneficial to the lumber market.

GPO 812–841–2

Commodity Standards Division



Forest Service regional experiment stations and Forest Products Laboratory

GPO 812–841–1