Belongs in v. 3

207

ARMY INDUSTRIAL COLLEGE.
Washington, D. C.

WOOD AND WOOD PRODUCTS.

Lecture

by

Mr. Axel H. Oxholm,
Department of Commerce.

March 14, 1927.

INTRODUCTORY REMARKS - COLONEL IRVING J. CARR, S.C., D.O.L.

Gentlemen:

This morning we are taking up the matter of wood and wood products, a subject that heretofore has not been covered in this college.

Mr. Oxholm, who is Director of the National Committee on Wood Utilization and also Chief of the Commodity Division of Lumber in the Department of Commerce, has come here this morning to give us a general set-up of his work.

We are particularly interested in wood conservation and reforestration and in our sources of supply for our needs in carrying out the production program in a national emergency. It is a subject that is intimately tied in with our general scheme and is one in which we are very much interested, particularly in probability of a shortage of lumber and wood utilization practices.

I have told Mr. Oxholm that we are fairly uninformed as to the activities of his office and asked him to give us a general statement of his activities.

I take pleasure in introducing Mr. Oxholm:

WOOD AND WOOD PRODUCTS.

Colonel Carr and Gentlemen:

It is naturally a very difficult matter for a civilian to appear before a group of officers and talk on the subject of Wood. We have taken up the question from a commercial point of view and you will look at it from the point of view required by the military end.

While many people believe that the requirements of the War and Navy Departments and those of private industry may be so different and that there will be no point of contact between them, I am very glad to tell you we do not believe that is the case. For a great many years it has been my privilege to work with the officials of the War and Navy Departments. We have found that we can very well develop specifications for governmental use which come very close to the commercial specification and at some future time we will undoubtedly be able to induce the Federal Specifications Board to adopt commercial specifications for almost all items.

The question of wood is not very well known. The reason for this is that we have never had any complete line of text books on the subject. You gentlemen have all seen text books on steel, concrete, metals, and what not, but I doubt very much whether you have seen any good text book on wood. That has been a very great handicap to the industry.

About a year and a half ago a conference was held in Washington for the purpose of studying the proper utilization of wood, and what could be done in order to insure the perpetuation of our forest resources. The War, Navy and other Government Departments were represented at that conference which was called by President Coolidge. After smme negotiations back and forth, the outcome of this meeting was the establishment of the National Committee on Wood Utilization, now located in the Department of Commerce.

Mr. Hoover is the Chairman of that Committee, Col. W.B. Greeley, Forester of the United States Department of Agriculture, its vice-chairman. We have about one hundred and thirty members recruited from all branches of industry and trade that we can think may have an interest in closer wood utilization, better manufacturing and distributing, and improved wood-using practices. It is not, as you may think, a lumber committee but is one dealing with all forest products ranging from lumber, timber and logs to turpentine, wood chemicals, charcoal, pulp, paper, wallboard and cardboard. This committee is steadily expanding as we take in new industries.

We have some of the very greatest authorities in the industry in the United States on this National Committee and some of the most important industrialists. I may mention some you all know - Mr. Fisher of the Fisher Body Corporation, Mr. Aishton, President of the American Railway Association. We have others, the Presidents of the American Pulp and Paper Association and The Wood Chemicals Association, etc., mine operators, lumbermen, engineers, architects and builders. This committee works in close cooperation with official and private agencies. Through a small executive committee which meets regularly, about once a month, in the Department of Commerce, the Committee's work is planned and executed.

We made a start with a small staff; we are gradually expanding and if industry would put up fifty percent of the expenses of operating the Committee it would be possible to obtain the remaining fifty percent from the Government. At present we are receiving supplies, office space and clerical assistance through the courtesy of the Department of Commerce. To all intents and purposes we function in the same way as other Divisions in that Department. We have the closest tie-up possible with the various divisions in the Department of Commerce and other Government departments.

Our idea is to let industry take the lead on the contemplated program because we feel that by so doing we will be assured of doing our work along practical lines. You all know that the United States Government has made some remarkable discoveries in its various departments, and has brought to light certain facts that would be extremely valuable to industry. Unfortunately in some cases the men that make these discoveries are like artists - not good salesmen. They cannot convey their message to the great mass of people that can use the information. The National Committee has been established for that purpose, to broadcast these discoveries and ideas to the public and to endeavor to increase the efficiency of the wood products industry; to get better and more efficient distribution of these products; to assist in standardizing specifications; and, above everything else, to assist the users of wood products in getting better service out of the forest products they buy.

I might add that the Committee has its contact officers with various departments. Major T.J. Hanley is the contact officer with the War Department. We are keeping the closest touch with him and call his attention to anything that would be of importance to the War Department. We think that in time our work will prove just as important to you as to industry.

The following is just a short description of the Committee and its program, and I will touch on a few of the concrete accomplishments during the last year. We have been working exactly one year now.

I mentioned to you that the Committee members are studying various problems through special sub-committees organized for that purpose. All of the contractors, builders, distributors or manufacturers on our Committee agreed on the subject of "short lengths" and their uses. We took up that question as one of the most important. By short lengths of soft woods we mean fir, pine, spruce, etc., of less than eight (8') feet in length. I doubt whether any of you have ever seen short length lumber in any lumber yard because it has not been sold in that form except in very rare instances. If you go to a lumber yard and ask for six (6') foot lumber the chances are nine-to-ten that the yard man will sell you a twelve (12') foot piece, cutting it up for you or asking you to do it. People might say, "Why do you ask the manufacturers to produce these short lengths if there is no demand for them?". It is perfectly true that our logs are cut to lengths of about sixteen feet and that theoretically all the lumber produced from those logs should be sixteen feet long, but we have large knots or other defects in the logs and when the lumber is cut it pays the manufacturers to cut out those knots, producing pieces shorter than sixteen foot. We have figures to show that the total production of softwoods in the United States is thirty-two billion feet (32,000,000,000') of hardwoods, corresponding to fifty-two (52%) percent of the total lumber production in the world. If we could sell all of these short lengths contained in a tree we could increase the present production of lumber of the softwood varieties by twenty-five (25%) percent without cutting a single additional tree.

Let the above be the answer to any statement to the effect that we are facing a shortage of timber. We do not believe that we are. We believe that we can make the public take the larger percent of these short lengths and thereby prevent a possible shortage of timber until the time the first crop, now being planted, becomes available.

Now, in order to deal with this problem in the most practicable manner, our Construction Committee, headed by Mr. John Foley, Purchasing Agent of the Pennsylvania Railroad, and a large group of contractors, builders, lumbermen, engineers and architents, made a report under Mr. Holtman's direction. Mr. Holtman is the Assistant Director of the Committee and has had long experience in wood construction work. Our program called for the analyzing of two hundred and fifty (250) house plans of the typical small American home, costing less than $25,000 to build. The result showed that forty (40%) percent of all lumber used in these small

houses was of the short length variety, less than eight feet, but the builders had purchased only one and one-half percent of short lengths. In other words, ninety-eight and one-half (98½%) percent of the lumber used in those houses was bought in long lengths and eighteen and one-half (18½%) percent of the total lumber bill was cut into short lengths on the job.

This is a study that has never been made before. It took a great amount of work and we are very proud to say that the results are bringing results right now. I shall not go into detail to tell you how we are trying to put over that short length campaign but it is sufficient to say that in one month we sold twenty thousand (20,000) of our pamphlets to people who were interested enough to pay ten cents a copy. We will go after all the important housing companies in the United States, the builders, contractors, etc., and interest them in this campaign.

Now, if that were all we had to say about the subject we would not be able to make much headway. It is all right to talk about conservation but it is not going to do you a bit of good to talk unless you can prove you are going to enrich the listener's pocketbook. With the exception of a few women's clubs and some conservation enthusiasts we have not found that we can make much progress unless the financial element is touched upon. For that reason everything must have a"pocketbook appeal" so far as the general public is concerned. When it comes to the War and Navy Departments we have to show the same pocketbook appeal because you are interested in showing Congress that you are using such labor saving and material saving devices as private business men have found practicable. This would also make a very strong appeal to those taxpayers who have to put up the money for your activities. I am now speaking perhaps a little too freely on the subject but I know the arguments the Department of Commerce has to put up for its appropriations. I do not know of anything that would appeal more to the public at this time than a statement that the War and Navy Departments are adopting some of these recommendations which would enable us to perpetuate our forest resources.

As to money saving, it might interest you to know that short length lumber can be purchased at the mill at a discount ranging from fifty (15) to forty (40%) percent. If the consumers do not buy the short lengths, what will be the consequence? The lumbermen will be forced to leave the defects in the lumber and will go just as far as he can in putting this material with its defects on the market. If the buyer does not take short lengths, the lumbermen will make him pay for this waste of material wherever possible and it is human nature to do so.

We can therefore improve the quality of lumber by taking short lengths. On the other hand consider, for instance, steel or other metals of a homogenous composition; it has been manufactured and can be shaped to fit any specification. Any scraps left over from the cutting of a bar or desired shape are immediately put back into the smelter and salvaged. With lumber that is not the case; once lumber is cut one cannot remanufacture it into longer lengths. One has to take it the way Nature supplies it. For that reason the specification question of lumber is so very much more important than that of steel. You do not pay one penny more for steel bars of various lengths because they are sold by the ton, but with lumber it is quite another matter - you pay up to forty (40%) percent more for lengths measuring more than eight feet in length. Naturally if you can use eight feet or less you would save just that much and enable the lumbermen to utilize their logs to best advantage.

I will now go one step further and say that in order to make the short lengths as useful to the consumers as possible we must show the consumer how to use them. Take flooring, for an illustration; we have in most homes or offices a carpet or rug covering most of the floor. If you will go in the Commerce or any other Department you will see pine floors made of long lengths of lumber free from defects and under the carpet the same quality as on the edges. Who can appreciate the quality of the lumber under that carpet? None but the scrubwomen who remove it. It would therefore seem to be a sensible policy to concentrate on the borders and use the shorter lengths under the carpet. We can also use knotty lumber under the carpet - I refer to the tight-knotted material which is just as serviceable for the purpose but may not have the same attractive appearance as clear flooring. There is a difference of fifty (50%) percent in price between the two items. That would mean a very important saving in connection with the present building program, for as you gentlemen perhaps know we are going through a period of six billion dollars worth of construction in the United States. If woodusers insist upon using long lengths for all purposes a lot of money will be spent unnecessarily.

We are working on a scheme of end-matching lumber; by that we mean providing one end with a tongue and one with a groove, just as on the sides. That means you can take lumber of any length, use it as it comes - placing one end to another; when you come to the end of the floor space, saw the last board off and use the end to start the next run. In this manner there is not an inch of waste. That proposition alone, I am convinced, would save the country fifty million dollars a year. I know one manufacturer down South who told me that by end-matching he had made one hundred

fifty thousand dollars profit last year on quality alone because it enabled his men to cut off the bad knots and turn the useable lumber into end-matched products. In other mills such short stock would be burned or wasted. There is no incentive for a man to put such lumber in the junk pile if he can get fifty percent more for it when end-matched.

Gentlemen, I want to tell you that this end-matching of lumber is the greatest achievement in the lumber field for the past fifty years. Consider what it means to the War Department for an example. Suppose in case of war you get some rush order for emergency barrack construction. By taking end-matched lumber you do not have to employ skilled carpenters to saw each of these pieces on the job to required lengths; anybody can install end-matched lumber. Our bulletin of end matching will be out within two months and this material can be applied to any kind of construction. We can use it for boxes of the larger variety; we think we can use it for elevator shafts; and there is a number of other uses for which we are trying to introduce this lumber. Perhaps you think end-matched lumber would not have sufficient strength having its joints between the joists. We have seen actual tests where a piano has been moved back and forth on such flooring and we know that it has sufficient strength.

I am sure that you have all heard of the activities of the American Lumber Standards Committee. At one time in New York City we came to the point where there were twelve different kinds of two-inch thicknesses; the producers were shaving the thickness of their lumber year after year. Mr. Hoover and his Lumber Standards Committee called a halt to that shaving process and now have the situation pretty well in hand. It is up to us to assist in putting over the program of using standard lumber. We think that in a few years the majority of lumbermen will produce only standard sizes. It is of the greatest importance to the War Department to always be able to know what exact thickness and width will be supplied by the trade.

There is another important question included in the Committee's program - that of seasoning and handling lumber. We are getting up four bulletins on the most efficient and economical ways of handling and storing lumber, each bulletin sponsored by five prominent men in the industry. I do not know whether these bulletins would be of great interest to you from the standpoint of storage, for I imagine you have worked out some very excellent methods, but they might contain a few new ideas for you.

The object of the seasoning study is to induce the lumber manufacturers to give proper attention to this subject. Seasoning is a very complicated process and there are considerable technical

difficulties to be overcome. Most manufacturers can season lumber at a cost not exceeding three or four dollars per thousand feet. It stands to reason that if lumber in seasoned condition increases in strength and at the same time loses in weight, from a consumer's point of view, we have a very important element of saving.

The cost of an order of seasoned lumber for the average frame house is not in excess of forty dollars. Therefore you can readily see how we feel about the contractors and builders who build houses made of green lumber that we know will not give satisfaction to the purchaser. It is nothing less than a crime to my mind. We have to be very careful about expressing our views before these builders but we are trying to induce them to use seasoned lumber.

We also encounter another difficulty - that of knowing whether we are getting the class of lumber for which we pay; whether we are getting, for instance, white pine, No. 1 Common, if we ordered same, or if No. 2 Common is supplied. Today the usual practice is to ship lumber without any marks whatsoever. We know that United States and Canada are the only two countries of any importance where the bulk of the lumber is sold unbranded. "Long Bell" has advertised its trade mark for a long time. However it is often a poor policy to sell trade marked lumber. It should bear the grade mark. Suppose you say you would like to get "Long Bell" lumber; there is an incentive to many distributors to mix a poor grade because you are not going to be so strict with your inspection. This grade juggling, gentlemen, is a great stumbling block to the users of wood and we have a scheme to do away with most of it - to put a clear indication at the end of each board of the grade, "No. 1 Common" or "No. 1 Clear", as well as the name of the mill which produced it. Asscheme has been worked out whereby the associations will guarantee these grades. I think that in two years time we will have the majority of the mills grade marking; they can not afford not to do so. The lumber manufacturers will be far more careful and the distributors will not have a chance to mix grades; lumber will be sold to you on the same grades as produced. You have undoubtedly found that at some time or other the supplies you received had been juggled. I remember that some time ago a man who had been supplying the War Department received an order for some lumber. When the car was delivered it was found that the lumber was marked "No. 2" and should have been "No. 1". The man was called on long distance and he explained the error, saying the wrong grade of lumber had been forwarded. All would have been well and no investigation made had not another car arrived the next day bearing the same mark. That man is on the War Department black list today. The War Department in this instance ordered No. 1; they could have used No. 2 just as well and that applies to almost every wood user in this country. If the grade mark

had not been put on the car by mistake the chances are nothing would ever have been said.

Here is a very important point the Committee has in mind - do not use a better grade of lumber than is needed for the work you are contemplating doing. Grade marks will edunte the consumers in regard to the proper quality to be used in each instance. Today we are producing only thirty-three percent of clear lumber on the West Coast, two-thirds of all lumber cut are of common grades. All the profit is made on the clear lumber, common lumber being sold at or below cost of production.

Those of you who have had foreign experience know that foreign lumbermen are placing grade marks on every piece of lumber produced in order to assure the ultimate consumer that he is receiving the quality for which he has paid. Even this is not considered as sufficient quarantee in all cases. For instance, in some foreign shipyards the labor unions demand that each plank to be used for scaffolding be suspended between two horses and four men jump up and down on these planks to make sure that they will serve the purpose for which they are intended. These shipyards undoubtedly find that No. 2 planks in many cases would serve the purpose of No. 1 quality and they are making up their specifications based on their practical experience. Grade marks are, therefore, valuable as an agent in educating the consumer in regard to lumber grades.

The public is grasping the idea of the value of grade marks and is taking an interest in the purchase of grade marked lumber.

I may mention also that I am a member of the Federal Specification Board and in time that Board will undoubtedly make the recommendation that grade marked lumber be given preference because dishonest dealers cannot put over anything with properly grade marked lumber. The evidence is right there; the producers name is on each piece of lumber and every truck load of grade marked lumber that goes thru the street is testimony in itself of properly manufactured and graded stock.

Another one of our problems is the utilization of wood chemicals. May I mention to you gentlemen that the United States has a relatively small wood chemical industry. There is no country I know of that should have a larger one. Let me give you an example of a few errors on our part. On the Pacific Coast twenty-five thousand (25,000) tons of charcoal is used for chicken and hog feed; most of this is being shipped from the East at a cost of fifty ($50.00) dollars a ton while on the Coast they could make it themselves at about twelve ($12.00) dollars a ton. It is also being imported from Mexico. Wood chemicals are being imported from Europe. In the Army

camphor plays a important part. We know that Formosa is the only commercially known source of supply of camphor. The other day we discovered that we were importing camphor from Germany; that same camphor is synthetically made from imported American naval stores. Three million pounds of rosin were shipped into this country last year. That shows the opportunity opened to us and the advantages taken by Germany of our failure to develop our wood chemical industry.

I do not blame the wood chemical industry so very much. We have practically no text books on wood chemistry. I doubt if there are six first class wood chemical experts in the United States; I believe the Government has the best. In order to prepare a hand book we had to go to Sweden to get a man who was familiar with the practices of the wood chemical industry all over the world.

Charcoal is used in all refrigerating cars; is used for domestic fuel; manufacture of powder, explosives, purification of gases and water; and is a big item in the requirements of the War and Navy Departments. The film industry is based on wood chemicals and there are many other industries depending on wood chemicals for raw materials which only an expert can tell you about. I mention them only to show you that the industry is vital and should be encouraged.

Then we have another committee activity, the object of which is to cut down the use of wood to the smallest possible extent in container construction. The men who have been working with us on this proposition have benn able by redesign of crates and boxes to reduce the quantity of lumber by fifty percent. Just think of what this means to the War Department in case of emergency to be able to reduce the weight of containers without sacrificing utility and strength.

We get a good many ideas from Sweden along these lines. Just recently I received a box of nails of special design and we are having them tested. If they prove to do all that is held out for them, we will be able to reduce the thickness of lumber of boxes and crates because the holding power of the nails is much greater than that of the common nails we now use. By using a special saw of conical shape one may give the lumber such a smooth surface that it will not be necessary to plane it, thus saving the boxing industry one hundred and twenty-five million feet of wood a year.

We are now working with a machine which will convert top logs into lumber. These logs are left in the forest today. We have two

of these machines in operation in this country and have found that we can cut the cost of labor in half and triple production as compared with the operation of band saws. You see that this project alone, if successfully worked out, would increase the total output of lumber by twenty-five percent at least. When you fell a tree you can only utilize down to ten (10") inches of the top, the balance being left in the woods. Now we ought to be able to haul the top logs to the mill and cut them into lumber.

Those things which I have mentioned to you are only a few of the projects put up by us by industry itself. We believe it is both impossible and impracticable to pass any laws in this country forcing people to engage in reforestration. You can no more force the farmer to reforest his timber lands than to compel him to grow cotton.

We all know that our very existence as a civilized nation is dependent upon timber; we are using one hundred twenty-five hundred million railway ties a year, five hundred million fence posts, millions and millions of telephone poles; ninety millions of people in the United States live in wooden houses; fifty percent of all the paper used in this country comes from domestic pulp wood. In fact practically everything you can think of is made from wood in one form or another. You may hear of substitutes and think you will not need wood but you will be very surprised to hear that many of these substitutes are wood products in another form. Your radio set may be of steel but the dial is made from wood, so is linoleum. You cannot get away from wood and for that reason the perpetuation of our forest resources is a very important matter.

I believe we can say that the average utilization of timber in this country is about thirty-three and one-third (33-1/3%) percent, which means that two-thirds of the tree is more or less wasted. Suppose that we could raise this utilization percentage by finding a market for the short lengths which are produced as a result of the closest possible utilization of the logs, and that so-called sawmill waste could be turned into pulp, paper, wood chemicals and other products. Such utilization would make it possible for the timber owner to double the present realization of his timber and it is only natural that under such conditions reforestration would be a profitable undertaking. It would not be necessary to exercise any pressure on timber owners to make them regenerate the forests.

While a certain amount of forestry education is necessary in order to stimulate this interest in reforestration, it is far more important to educate the public to the proper use of forest products so as to eliminate waste and increase the present low utilization percentage.

From the War Department's point of view you all know that in case of an emergency you plan to use two billion feet of lumber, making the War Department the largest single consumer of lumber in the country. It was a great source of satisfaction to our Committee to have been called into conference with Army officials in connection with the short length problem. Gentlemen, we are looking forward to the day when we can announce that to the public - the Army was the first organization to adopt the Committee's recommendations.

To those of you gentlemen who are interested in transportation may I mention this advantage in connection with the use of short lengths. If box cars are loaded with lumber in excess of eight feet in length, for instance sixteen feet which is a current dimension, there will be a space of six to eight feet left, usually behind the car door. Sometimes this space may be occupied by lath or shingles but it would be logical to utilize this space for the loading of short lengths of less than eight feet. That this matter of loading cars to capacity is an important matter both in normal times and in times of emergencies is evident, and in making up specifications for car load lots this question of short lengths should be taken into consideration.

I have only touched upon a few of the major points of our program, and if you think that the National Committee on Wood Utilization can be of any assistance to you in drafting your specifications and in securing your supplies, we shall be glad to cooperate with you. We realize that it may be difficult and at times embarrassing for you to ask the suppliers of forest products to advise you in such matters and at times such information may not be easily obtained. In such cases I feel that the National Committee on Wood Utilization may be on considerable assistance.

As our work progresses we expect to turn out a number of pamphlets and handbooks and we shall be glad to place this material at the disposal of the Army Industrial College.

In closing, permit me to thank you, Colonel Carr, for the opportunity of addressing the Army Industrial College, and you gentlemen, for having given me so much attention.