

# UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE

HENRY & GRAVES, FORESTER

# INSTRUCTIONS

FOR THE

# SCALING AND MEASUREMENT OF NATIONAL FOREST

TIMBER







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# U. S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE.

HENRY S. GRAVES, FORESTER.

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# THE SCALING AND MEASUREMENT OF NATIONAL FOREST TIMBER.



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# CONTENTS.

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L.	The scaling and measurement of National Forest timber
	Regulation on scaling
	Use of customary commercial units
2.	Scaling logs
	Policy
	Scale of timber in the log
	Use of mill checks
	Defects in the log which reduce the scale
	Mill overrun
	Assurances to purchasers
	Definition of merchantable logs
	Designation of places for scaling
	Frequency of scaling
	Requirements of purchasers
	The log rule
	Log lengths
	Allowances for trimming
	Measuring, numbering, and stamping logs
	Measuring log lengths
	Measuring diameters
	Numbering logs
	Scale book letters
	End check on logs
	Stamping logs
	Check on total number of logs
	Deductions for defects
	Interior defects
	General rule
	Center or circular rot
	Ground or stump rot
	Circular shake or pitch rings
	3
	*

#### CONTENTS.

2.	Scaling logs—Continued.
	Deductions for defects—Continued.
	Interior defects-Continued.
	Pin dote or peck
	Check or pitch seam
	Cat face
	Dote appearing in knots
	Worm holes
	Side defects.
	Unsound sap
	Checks
	Other side defects.
	Minimum length and width of lumber
	Curve or sweep.
	Crotches
	Determining the merchantability of logs
	Scaling green and dead timber
	Penalty scale.
	Settlement of complaints
	Check scaling.
	Mill scale studies.
3.	Scaling from the stump
	Use of stump scales
	In timber trespass
	In sales by estimate
4.	Cubic measurements
	Policy
	Merchantable timber
	Requirements of purchasers
	Check measurements
	Cord measure
	Policy.
	Cord measurements
	Stamping and numbering
	Cubic foot measure
	Policy.
	Measurements
	Deductions for defect

## CONTENTS.

.

		Page.
5.	Linear measurements	31
	Policy	31
	Merchantable timber	31
	Requirements of purchasers	32
	Measurement	32
	Board-foot equivalents	33
	Stamping and numbering	33
	Check measurements	33
	Combined linear and diameter measurement	33
6.	Counting	34
	Policy	34
	Merchantable timber	34
	Requirements of purchasers	34
	Stamping and numbering	34
	Check measurements	34
7.	Weighing.	35
8.	Records and reports	35
	Scale books.	35
	Penalty scale records	36
	Check of scale books	37
	Cutting reports	37
	Penalty scale reports	38
	Check and record of cutting reports	38
	Scale records for purchasers	38
	Report of timber sold and cut	38
	District forester's monthly report	30
	Annual report	30
	Report on miscellaneous products	30
9	Appendix	40
υ.	Table 1 Scribner Decimal C log rule	40
	Table 2 — Cull for rectangular defects	46
	Table 3 — Cull for squared defects	56
	Table 4 — Solid cubic contents of logs	50
	Table 5 — Board foot contents of standard sizes of timber	00 61
	Table 6 — Standard converting factors	64
	Table 7. Converting factors Chostnut talashing sales	04
	rane	60

9. Appendix—Continued.	Page.
Table 8.—Areas of circles	66
Table 9.—Taper for scaling in maximum lengths of 16	
feet	67
Table 10.—Taper for scaling in maximum lengths of 32	
feet	68
Sample page 1, Form 231, saw timber	70
Sample page 2, Form 231–D1, saw timber	72
Sample page 3, Form 631, saw timber	74
Sample page 4, Form 631, saw timber, summary sheet.	76
Sample page 5, Form 231, cubic feet and cords	78
Sample page 6, Form 648, cord measurement	80
Sample page 7, Form 651, shingle bolts	82
Sample page 8, Form 231, telephone poles	84
Sample page 9, Form 231-D1, linear feet	86
Sample page 10, Form 648, mining timbers, ties, and posts.	88
Douglas fir log grading rules—	
(1) Of the Puget Sound Log Scaling and Grading	
Bureau	- 90
(2) Of the Columbia River Log Scaling and Grading	
Bureau	90
Western yellow pine log grading rules	91

# THE SCALING AND MEASUREMENT OF NATIONAL FOREST TIMBER.

The following instructions govern the scaling and measurement of National Forest timber. They supplement the National Forest Manual and will be followed in the administration of timber sales, timber settlements, timber trespass, free use, and administrative use. Uniform standards and methods are necessary in all National Forest work involving the measurement of timber. It is therefore essential that these instructions be carried out strictly by all Forest officers.

Unless timber is sold on an estimate in the tree, it must be scaled, counted, or measured before it is removed from the cutting area or from the place designated for scaling.

# **Regulation on Scaling.**

The regulation of the Secretary of Agriculture on scaling National Forest timber is as follows:

REG. S-18. No timber cut under any contract shall be removed from the place designated until it has been scaled, measured, or counted and stamped by a Forest officer, unless such removal is specifically authorized in the agreement.

No person except a Forest officer shall stamp any timber belonging to the United States upon a National Forest with the regulation marking ax or any instrument having a similar design.

The Scribner Decimal C log rule, as used by the Forest Service, is the official rule for scaling National Forest timber.

#### Use of Customary Commercial Units.

National Forest timber will ordinarily be appraised, sold, and measured by the customary commercial units. As the standard practice, saw timber will be scaled by the thousand board feet log scale, railroad ties by the piece of stated maximum and minimum size, mining timbers by the piece or linear foot, telephone poles by the piece of stated length and diameter class, piling by the linear foot, and fuel, shingle bolts, and pulpwood by the cord or its equivalent in solid cubic feet. Other units may be used for these products, however, when better adapted to local trade customs.

# SCALING LOGS.

#### POLICY.

# Scale of Timber in the Log.

The material purchased in National Forest sales is timber in the log, not manufactured lumber. In its measurement it is necessary to determine the merchantability of the log as a commercial product in itself. Timber will therefore be scaled as far as practicable in accordance with the defects or indications of defect in the log. It will not be scaled in relation to the lumber grades to be manufactured from it or on the basis that only material calculated to produce certain grades of lumber is merchantable.

"Straight and sound" is an expression common in parts of the United States which indicates a scale based upon the log rather than upon lumber grades. It means the straight and sound material in the log after deductions have been made for visible defects which render parts of the log crooked or unsound. Since this term has been identified with various local standards of utilization, however, it will not be used in defining the basis of scaling adopted by the Forest Service.

Scaling on the log rather than on lumber grades is the standard practice of the Service for the following reasons:

(1) The unit of measure is regarded as more stable, with less fluctuation from year to year, than where lumber grades are followed. Greater certainty is thus assured purchasers as to what material they will be required to pay for throughout the life of their contracts.

(2) The basis of scaling is less subject to individual judgment. It is more readily learned by scalers and more uniformly applied, and hence is more practicable as a common standard for a large number of scalers in timber of varying size and quality.

(3) Mill tallies are not required for effective application of the scale or to settle complaints by purchasers. The obligation to check the scale by mill studies, which is implied in scaling to certain lumber grades, is avoided. The accuracy of the scale is directly and inexpensively determined by a check on the logs themselves.

8

# Use of Mill Checks.

At the same time, knowledge of the various lumber grades and of how timber "cuts out" is of great assistance to scalers. The best way to train the judgment in making deductions for particular kinds of defect is to see how defective logs open up in the mill and the actual loss as compared with sound logs of the same size. Frequent mill checks are therefore desirable, not to correct the previous scale, but to train the scaler's judgment in making allowance for various classes of defect.

In training and instructing scalers, check scaling, settling complaints, discussing proposed sales, and other matters of scaling practice, however, scaling to include certain grades of lumber and exclude other grades will be avoided as far as practicable.

# Defects in the Log which Reduce the Scale.

Deductions will not be made for defects outside of the cylinder represented by the top end and total length of the log or for defects in the portion of the log which will be slabbed off. Otherwise deductions will be made in Forest Service scaling for all visible defects which will actually reduce the yield of lumber from the log. This includes crooks and any defective or waste material whose presence is plainly indicated on the surface of the log by conks, rotten knots, pitch seams, etc. There must, however, be an unmistakable surface indication of the defect. The scale should never be reduced simply because the timber is known to be more or less defective, or because hidden defect frequently appears in sawing.

The total scale of the log will be reduced in each instance by the estimated loss in lumber from the defects present in the cylinder as compared with a sound cylinder of the same dimensions. Reductions will not be made for defects in the swell of the log outside of the cylinder. Scalers should reduce the scale for all other defects regardless of overrun. The total overrun for all sources including taper, based upon the standard Service method of scaling, is obtained from mill studies and taken into account in fixing the price of the timber. Overrun should not affect the scale in any manner or influence the scaler in making reductions. Allowance must therefore be made for every defect which will cut down the yield

# 10 THE SCALING OF NATIONAL FOREST TIMBER.

of lumber as compared with a sound cylinder of the same length and diameter. Defects outside of the cylinder or which will be slabbed off should be disregarded.

In applying the foregoing, the shortest length considered in determining the amount of lumber lost on account of a defect will be the minimum log length of the species stated in the contract. The minimum width will be 4 inches.

Deductions will not be made for "sound" defects, such as sound knots, however large, and firm red rot, sound blue stain, or other discoloration, which affect the grades of lumber but do not reduce the total cut from the log. Deductions will be made only for crooks, curve, or sweep, and for unsound material such as rot, broken-down sap, shake, checks, worm holes, and pitch rings.

# Mill Overrun.

In making mill checks or more extensive "mill studies," it is of course desirable to compare the total cut of all merchantable grades of lumber with the log scale under the standard Service method; thus determining the overrun.

Mill overrun is made up of:

(1) Any saving in saw kerf under one-fourth inch, the kerf upon which the scale rule is based.

(2) The saving in kerf from cutting dimension stock, timbers, and other material over an inch thick.

(3) Trade practice in cutting lumber of scant thickness.

(4) Utilization of narrow widths in slabbing, not included in the diagrams upon which the Scribner scale is based.

(5) Utilization of short lengths from the swell of logs, not included in the Scribner diagrams.

(6) Utilization of lumber grades which admit considerable unsound material, rot, broken-down sap, etc., which should be eliminated in the scale.

The first five sources of overrun are obtained from all classes of logs, sound as well as defective. The normal overrun from these sources under the Scribner log scale ranges from 4 to 20 per cent, depending upon the size and taper of the timber. This overrun should be secured under Service scaling in sound timber. In defective timber it should be obtained in the grades of lumber admitting sound defects—such as sound knots, firm red rot, etc.—for which no deductions are made in the scale.

Since the scale deducts for all unsound defects visible in the log, except those outside of a cylinder represented by the top end and length and those which will be slabbed off in milling, lumber grades containing considerable amounts of such defect, if such lumber is manufactured, should under accurate scaling be largely overrun. Good scaling under the Service standard should thus yield an overrun equivalent to the greater part of the cut of grades which contain considerable quantities of unsound defect in addition to the normal overrun on sound logs.

The methods of manufacture of particular purchasers will not be taken into account by scalers. No attempt should be made to adjust the scale to losses due to poor equipment or inefficient methods, or to catch up gains from exceptionally close utilization. It is the scaler's function to determine the amount of sound material in the log as uniformly as possible, whatever the overrun may be.

# Assurances to Purchasers.

No assurances regarding the Forest Service scale should be made to purchasers, except that—

(1) The Service will give them a scale of the sound material in the log under the Scribner Decimal C rule. The Service practice of reading diameters to the nearest, instead of the next lower, inch should be made clear, together with the requirements governing maximum scaling length, trimming allowance, and penalty for overrunning the trimming allowance.

(2) The Service will make systematic checks on the local scale by more experienced scalers of special competency.

(3) The Service will make special check scales by the best men in its organization in case of serious complaint.

Where mill-scale studies have been made, prospective purchasers may be furnished with the results of the Service scale in given classes of timber as to species, size, soundness, etc., and under specified manufacturing methods. The furnishing of such information should, however, convey no direct or implied guaranty whatsoever on the overrun in a proposed scale. Assurances to purchasers should be restricted absolutely to those given above. Never should any assurances or promises be made on amount of overrun.

# Definition of Merchantable Logs.

Every timber-sale agreement should define exactly the material to be classed as merchantable under its terms. Exceptions to this rule may be made only in rangers' sales where satisfactory standards of utilization have been established. In sales of sawlogs this definition will consist of:

(1) The minimum length of merchantable logs.

(2) The minimum diameter at small end.

(3) A minimum percentage of the gross scale of the log remaining after deductions for visible indications of defect. (See merchantability clause, Form 202, Timber Sale Agreement.)

As rapidly as practicable, standard percentages under No. 3 will be established for each species in each region. These will ordinarily be applied uniformly in sawlog sales. They should be not more than 33<sup>1</sup>/<sub>3</sub> per cent of the gross scale of logs of the more valuable commercial species, and not more than 50 per cent of the gross scale of logs of inferior species.

As rapidly as the necessary data are obtained from mill studies or other thorough investigations, the standard definition of merchantable logs may include a specific statement of the treatment in Service scaling of common defects or alleged defects in the timber of the region. This makes the work of different scalers more uniform and the Service standard more stable. It is particularly desirable to indicate that no deductions will be made for defects, like firm red rot and firm blue stain in Idaho white pine, which mill studies have shown convincingly do not affect the cut of sound grades of lumber.

# Designation of Places for Scaling.

Unless specified in the contract, the places where timber is to be scaled will be designated by the officer in charge of the sale. Such places should be adapted, as far as reasonable economy in scaling will permit, to the practical requirements and methods of operation, so as to impose as little additional cost upon the operator as possible. Scaling will not be done, however, in places or under conditions dangerous to life or limb.

# Frequency of Scaling.

In small sales the frequency of scaling must be adapted to the reasonable requirements of the purchaser. It is desirable to scale only at intervals within which considerable quantities of timber are logged and assembled, such as 15,000 or 20,000 feet. Any such measures to promote economy must, however, be enforced only as far as it is practicable for the purchaser to comply with them.

In larger sales the most economical plan of scaling should be considered in advance and provided for in the agreement. (See Standard Clauses 29, 30, 31, National Forest Manual, p. 27–8.) Clause 31 should be generally used in sales where operations will be conducted simultaneously over a considerable area.

#### **Requirements of Purchasers.**

To permit scaling at reasonable cost, purchasers may be required to assemble and hold logs for scaling. This should be covered by a specific clause in the contract. On the other hand, methods of scaling should, so far as practicable, be adapted to the operating methods of the purchaser. The decking or skidding of logs solely for scaling is usually unnecessary and should be required only in classes of operations where it is essential for efficient or economical scaling. (See Standard Clauses 29, 30, and 32, p. 27–S of the National Forest Manual.)

If cutting is to be done on Government and private lands simultaneously, the purchaser should be required to keep the logs separate up to the point of scaling. (See Standard Clause 33, National Forest Manual, p. 27–S.)

The Forest officer in charge should require piles or skidways to be constructed so as to permit economical scaling.

Where necessary and practicable, the purchaser will be required to mark top ends of logs to avoid question and to expedite scaling.

## The Log Rule.

All saw timber will be scaled by the Scribner Decimal C log rule. This rule drops the units and gives the contents of a log to the nearest 10 board feet. One cipher added to the sum of the numbers read from the scale stick gives the total scale of the log, except in the case of 6-inch logs 6, 7, 8, and 9 feet long and 7-inch logs 6 feet long. The reading for these is 0.5, which multiplied by 10 gives 5 feet as the actual scale.

Scale sticks for logs of even lengths are furnished in 30, 36, 48, 60, 72, and 96 inch lengths. Scale sticks showing odd lengths will be furnished whenever the demand is sufficient to warrant their use.

In the absence of a scale stick, or where the position of logs in the pile makes its use difficult, their diameters and lengths may be taltied and the scale figured from a table later, fair allowance being made for defect.

Table 1 on pages 40 to 45 of the Appendix gives the contents of logs of both odd and even lengths of 6 to 32 feet and of diameters of 6 to 120 inches. One cipher must be added as with the scale stick.

# Log Lengths.

On all National Forests except those in Alaska and west of the summit of the Cascade Mountains in Washington and Oregon, logs over 16 feet in length will be scaled as two or more logs, as far as practicable, in lengths of not less than 12 feet. The diameters of other than the top length should be increased in accordance with the taper of the stick. For example, a 42-foot log 16 inches in diameter would be scaled as:

One 12-foot log with a diameter of 16 inches.

One 14-foot log with a diameter of 17 inches.

One 16-foot log with a diameter of 19 inches.

Taper Tables 9 and 10 on pages 67 and 68 of the Appendix are to be used simply as a guide, the allowances for taper being varied to conform to the actual taper.

On the National Forests in Alaska and west of the summit of the Cascade Mountains in Washington and Oregon, logs up to and including 32 feet in length will be scaled as one log; lengths from 34 to 64 feet, inclusive, will be scaled as two logs as nearly equal in length as possible in even feet. Greater lengths than 64 feet will be scaled as three logs, making the divisions as nearly equal as possible in even feet, and increasing the diameters according to the taper of the log.

When logs are scaled as two or more logs the scale allowed for the separate lengths will be added and the total recorded as one log.

The use of logs of odd lengths by purchasers should be encouraged.

### Allowances for Trimming.

The scaling length clause of Form 202 specifies a definite allowance for trimming. This allowance should be adapted to different logging conditions and to large and small timber. Three inches overrun will ordinarily be sufficient for small timber where the danger of brooming is slight; while six inches may be reasonable in sales of large timber or where the danger of brooming in driving or chuting is great.

MEASURING, NUMBERING, AND STAMPING LOGS.

# Measuring Log Lengths.

The length of all logs about which there is any question in the mind of the scaler will be measured. In addition, the length of logs in the general run will be measured frequently enough to make sure that the specified trimming allowance is not exceeded. Any logs overrunning the trimming allowance will be scaled to the next foot in length, as outlined under "Penalty scale," page 24.

Frequent measuring is of special importance in small sales where a scaler is not always present, since sawyers are more apt to be lax than when the lengths are checked daily by a Forest officer.

# Measuring Diameters.

All diameters will be measured inside the bark at the top end of the log. If logs are not round, scalers will average the greatest diameter with that at right angles to it. Four diameters may be measured where necessary to obtain a fair average. The necessary reduction in diameter will be made for swellings at the scaling end of logs from which no lumber can be cut.

Diameters will be rounded off to the nearest inch above or below the actual diameter. Logs which have a diameter exactly half way between inches will be thrown to the next lower inch.

# Numbering Logs.

Every log, whether merchantable or cull, must be numbered with crayon as soon as it is scaled. Numbering is necessary even where the logs will be sawed immediately or rolled into water. The scale of the log will be entered opposite its number in the scale book, or the letter c in the case of cull logs.

This feature of Service scaling is essential and must be followed, in spite of its apparent uselessness under some conditions, for the following reasons:

(1) It is a check on the total number of pieces scaled.

(2) It fixes the responsibility of the scaler for his scale by individual logs. It is thus a safeguard against lax scaling.

It permits an exact check on the scale at any time. This is desirable, even where logs are manufactured immediately to enable the supervisor, check scaler, or inspector to make an absolute check whenever the sale is visited, if only on half a dozen logs.

(4) It affords an equally definite basis for the settlement of complaints; and is thus a protection to purchasers. .

The numbering of cull as well as merchantable logs is desirable both to check the total number of pieces scaled and to fix the responsibility of the scaler. The latter is as essential in the matter of culling logs as in making an accurate scale of merchantable logs.

# Scale Book Letters.

In sales which require the use of more than one scale book, the books should be lettered serially with the letters of the alphabet, in the order in which they are used.

In large sales serial numbers need not be continued throughout the contract, since numbering is intended only for the identification of individual logs. It is usually sufficient to number logs consecutively to the end of each scale book, beginning the next book with No. 1. The series should not be changed so frequently, however, as to make the identification of logs uncertain. There should as a rule be an unbroken series of scale book letters and log numbers covering the cut of each logging season.

#### End Check on Logs.

As a general rule, every sawlog should be check marked on the end which is not numbered. Where a series of scale books is to be used, the initial of the book in which the log is recorded makes the best end check. This practice aids the check scaler in locating the original scale entry, insures getting all the logs in a deck or skidway, and automatically requires the scaler or scalers to see both ends of each log.

# Stamping Logs.

Every merchantable log scaled will be stamped "U. S." on at least one end. Logs so defective as to be unmerchantable under the terms of the contract will be stamped and a circle drawn around the stamp thus,  $(\overline{\mathbf{U}, \mathbf{S}})$ ; or a special cull stamp or distinctive mark used.

It is essential that cull logs be plainly distinguished from merchantable logs by a mark which will identify the culling as done by a Forest officer. This can ordinarily be accomplished by the U.S. stamp in a circle or a circle with the initials of the scaler. It is also desirable to make the distinguishing mark as permanent as possible. This is necessary to show the disposition made of the log in the event of another officer taking charge of the sale, of checking the area over for penalty scale, or of subsequent inspections of the cutting. For this reason a stamp in some form is the most satisfactory cull mark.

It is essential to distinguish sharply between logs which are merchantable under the rule as to per cent of sound contents specified in the contract and cull logs. No logs should be stamped as merchantable which do not scale the per cent of their gross contents required by the sale agreement. Any log not meeting this qualification should be culled. The merchantable contents of cull logs will never be scaled and charged against the purchaser, whether they are utilized or not. Purchasers may remove any cull material without charge at their option.

The foregoing does not apply to sound logs underrunning the minimum lengths and diameter stated in the contract. Such logs, which the purchaser desires to utilize, will be scaled and stamped as merchantable. (See Standard Clause 17, p. 26–S of the National Forest Manual.)

## Check on Total Number of Logs.

The logs in each pile or skidway will be counted after scaling, and the total checked with the number of entries in the scale book.

#### DEDUCTIONS FOR DEFECTS.

The effect of rot and other defects upon logs of different species and in different regions varies so greatly that no rules for making deductions can be applied inflexibly. The constant exercise of good judgment by scalers based upon an accurate knowledge of local timber is essential. Scalers should at every opportunity train their judgment in deducting for defects by watching defective logs open up under the saw.

Defects are classified as follows:

- (1) Interior defects, which cause waste in the interior of logs.
- (2) Side defects, which cause waste on the outside of logs.
- (3) Defects from curve or sweep.
- (4) Defects from crotches.

#### INTERIOR DEFECTS.

# General Rule.

Interior defects showing in one or both ends of the log may, for reductions in scaling, be treated as sawed out in squares or rectangles. The Scribner Decimal C rule is based upon diagrams of 1-inch boards with 4-inch kerf. Twenty per cent of any square or rectangle inside the slabbed surfaces of the log is, therefore deducted for kerf in the rule. This deduction is carried in scaling sound timber, and hence should not be included in allowances for defect.

The scaler should first measure the end dimensions of the square or rectangle which will be wasted in manufacture and determine its length. From its computed contents in board feet 20 per cent should be deducted as the scale rule's allowance for saw kerf and the remainder raised or lowered to the nearest 10. The gross scale of the log should then be reduced by this amount.

The substance of this method is to deduct 80 per cent of the board foot contents of a piece of timber having the same dimensions as the defect. The entire process may be stated algebraically as follows: If a and b represent the end dimensions of the defect in inches, l the length of the defect in feet, Y its solid contents in board feet, and Xits contents in board feet after 20 per cent is deducted for kerf, X, or the net reduction to be made in the scale, may be obtained as follows:

$$\frac{a \times b \times l}{12} = Y. \qquad X = Y - 0.20 \times Y$$

or, reducing these equations to their simplest form,

$$X = \frac{a \times b \times l}{15}$$

#### SCALING LOGS.

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X must then be raised or lowered to the nearest 10.

For example, a defect squaring 5 inches extends through a 16-foot log.  $\frac{5\times5\times16}{15}$ =26<sup>2</sup>/<sub>5</sub>, or rounded to the nearest 10, 30 board feet, the

allowance for defect to be taken from the gross scale of the log.

For example, the waste in cutting out a defect which extends through a 16-foot log is  $4 \times 9$  inches.  $\frac{4 \times 9 \times 16}{15} = 38.4$ , or 40 board feet, the net allowance for the defect.

Table 3 on page 56 of the Appendix gives, in lengths of from 6 to 32 feet, deductions for interior defects which square from 2 to 30 inches.

Table 2 on page 46 gives deductions for similar defects which must be cut out in rectangles.

Where defects of these classes show in both ends of the log the larger dimensions will be taken in logs 16 feet and under in length, and the average dimensions in logs over 16 feet. If a defect does not appear in both ends of the log the scaler should estimate its length, taking the other dimensions in full as shown at the defective end.

As explained hereafter, it may be necessary to depart from the general rule in deducting for cat faces and some forms of butt rot.

#### Center or Circular Rot.

The defect should be squared or inclosed in a rectangle and the proper deduction determined in accordance with the preceding instructions.

Many rules of thumb for determining the deduction for center or circular rot are in common use. These are usually too inaccurate for Service scaling. One of the best which gives results close to those obtained by the foregoing calculation is as follows:

Obtain the average diameter of the rot at each end of the log and average these two figures. Add to the average diameter:

 $\frac{1}{3}$  if it is 12 inches or less.

1 if it is from 13 to 20 inches, inclusive.

 $\frac{1}{2}$  if it exceeds 20 inches.

Obtain the scale of a log of this diameter, as extended, and the same length as the log in question. Deduct this amount from the gross scale of the log. In the case of 16-foot logs only the deduction for circular rot can be obtained by squaring the diameter of the defect in inches and rounding off to the nearest multiple of 10. If the average diameter is 7 inches, for example, its square would be 49, or rounded off, 50 board feet. (Read as 5 in the Scribner Decimal C log rule.)

The use of the foregoing rules is authorized if desired in special cases, but the standard practice of the Service will be to deduct for center rot as for other interior defects by the readings given in the tables on pages 46 to 57 of the Appendix.

# Ground or Stump Rot.

Ground or stump rot in butt logs seldom extends far into the log and usually tapers to a point. If it joins center rot from above or extends well up into the log, the defect comes under center or circular rot.

Where stump rot spreads from the center of the log to within a short distance of the bark, a section of the log containing the defect should be cut out in scaling. Additional allowance should be made as under center or circular rot if the defect extends into the log above the section cut out.

The scaler must exercise judgment in deducting for ground rot, comparing the diameter of the defect with that of the butt and sighting along the log to see if any boards can be cut from sound material outside of the rot. Where this defect occurs on only one side of the butt, it usually extends but a short distance into the log. Much of it will frequently come out in the slab, especially where there is considerable "flare" or swell.

# Circular Shake or Pitch Rings.

The standard rule for interior defects should be applied to the material within the outer shake or pitch ring. If there is a sound core of merchantable size inside of the shake or pitch ring, it should be scaled as a separate log. The difference between its scale and the amount of material obtained by squaring the outer dimensions of the defect is the net deduction from the full scale of the log.

The rules of thumb given under "Center or circular rot," page 19, apply also to circular shake or pitch rings.

#### SCALING LOGS.

#### Pin Dote or Peck.

Pin dote or peck appears on the ends of logs as little rotten spots or pockets usually occurring in a roughly circular area. Logs containing it may "open up" poorly, the doty spots frequently converging and forming a mass of more or less broken-down material. It often extends into knots. If the area of defect on the end of the log is 4 inches or more in diameter, deduction should be made under the standard rule for interior defects. Defective areas less than 4 inches in diameter can usually be disregarded.

# Check or Pitch Seam.

The scaler should first ascertain whether the seam shows at both ends of the log and if it is straight or twisted. The greater the twist, the larger will be the amount of waste. If the seam shows at only one end of the log, the distance which it extends into the log must be measured. The dimensions of waste material in sawing the seam out should also be measured on the end of the log. Deduction for the defect should then be determined under the standard rule for interior defects.

#### Cat Face.

Proper deduction for cat face can not be made under the general rule for interior defects. The log should be divided into sections, throwing the defect into one section. The scaler should determine what part of the total length of the log is affected, find the contents of this section on his scale stick, and determine the portion of the section which will be lost in sawing. The latter should be deducted from the gross scale of the log.

For example, in the butt of a 16-foot log with a top diameter of 24 inches, scaling 400 feet b. m., there is a cat face 5 feet long extending to the heart of the log. The cat face tapers toward the top where it will come out in slabbing and affects about 4 feet of the log. The 4-foot section affected contains one-fourth of the scale of the log, or 100 feet b. m. The defect will throw out one-half of this 4-foot section, or 50 feet b. m., the amount to be deducted. Here again judgment and knowledge of the timber are necessary. While the defect may extend to the heart of the stump, it may taper rapidly toward the top and perhaps affect only one-third or less of the section.

## Dote Appearing in Knots.

Defect in the log is sometimes shown only by rot or dote in the knots. No fixed rule can be applied in such cases. Deductions must be made in accordance with the scaler's knowledge of how such logs "open up."

Dote in knots is an indication of an enlarged area of rot in adjoining portions of the log. When rot appears both at the ends of a log and in its knots, the deduction, depending on the number of knots affected and their size and position, should ordinarily be from 25 to 50 per cent greater than when the ends alone are defective.

# Wormholes.

Deductions for wormholes depend upon their number and extent. A few scattered holes can ordinarily be disregarded. Where such holes are so numerous or so large as to clearly cull the material affected, deductions should be made as for other interior defects. Knowledge of how wormy logs open up and the number of worm holes admitted in merchantable lumber is necessary for accurate scaling in such timber.

#### SIDE DEFECTS.

#### Unsound Sap.

The sound heartwood alone should be measured in logs with a shell of unsound sap.

Sound blue sap or firm stain, not broken down or worm-eaten, will not ordinarily be regarded as a defect.

# Checks.

Where a number of deep checks extend from the surface toward the center of a log, the scaler will measure the diameter of the sound core within the largest circle which can be described on the scaling end without being seriously cut into by checks. All material outside of this circle should be thrown out as defective. The sound core will usually be measured on the small end of the log. If the core of solid material is smaller at the butt end, however, measurement should be made there for scaling. Deductions for single checks may be made by measuring the rectangle of waste material as in the case of interior defects.

# Other Side Defects.

Scalers should not lose sight of the fact that the waste caused by defects on the side of a log is much less than in the case of defects near the center, since much of the unsound material will come out in slabbing, or is outside of the cylinder represented by the top end of the log and its total length. This is especially true of defects on butt logs with considerable flare or swell.

In culling for fire scars which are not classed as cat faces and other side defects, like those caused by lightning, the scaler should determine the depth of the defect. If it will not be cut off in slabbing, proper deductions should be made by measuring the loss in accordance with the rule for interior defects; or in the case of very irregular patches of waste, by estimating the percentage of the log affected.

The scale is not ordinarily reduced by spiral lightning scars, which do not usually run deep and most of which are removed in slabbing. The percentage of loss is proportionately greater in small than in large logs.

# Minimum Length and Width of Lumber.

It is of special importance in deducting for side defects to bear in mind the minimum length and width of merchantable lumber followed in Service scaling. (See p. 12.)

#### CURVE OR SWEEP.

The percentage of waste from sweep or curve varies with the diameter of the log. A curve of 3 inches in a 10-inch log will cause approximately twice the proportionate waste as the same curve in a 20-inch log. Sweep which would cull a very small log would not necessarily cause the rejection of a large log.

The scaler should sight along a curved log, noting where the saw will square it sufficiently to cut boards on both sides affected by the curve. In determining the amount of loss it should be rememberedthat material near the slab saws out narrow boards containing fewer feet than those cut from any other part of the log.

No deduction should be made for curve or sweep in logs over 16 feet long.

#### CROTCHES.

Except in rare cases, crotches do not affect the scale of logs. If the end or upper portion of a log is badly crotched, proper deduction should be made from its length. In any case where a crotch occurs, the scaler should obtain the average diameter of the log just below the swelling caused by the crotch. This may be done by measuring the diameter at the butt and making the usual allowance for taper.

#### DETERMINING THE MERCHANTABILITY OF LOGS.

The per cent of the total scale of a log, which determines its merchantability, should always be reckoned from the full scale, including unsound sap, checks, curve, and any other defects present.

#### SCALING GREEN AND DEAD TIMBER.

In sales which include green and dead timber at separate stumpage prices, the scaler should not attempt to trace logs from the tree to establish their character, but may classify them on the appearance of the log at the point of scaling. (See Standard Clause 34, National Forest Manual, p. 27–S.)

#### PENALTY SCALE.

The penalty-scale clause of Form 202, provides for liquidated damages to cover losses to the United States which result from leaving material in the woods or cutting contrary to the terms of the contract.

Enforcement of the penalty-scale clause is necessary except in accidental or exceptional cases involving small amounts of timber, where it may be waived by the officer in charge. Whenever waste subject to the penalty-scale clause occurs, the officer in charge will notify the purchaser and call his attention to the utilization required by the contract. If further waste occurs, or if material previously left in the woods whose utilization is practicable is not removed, a penalty scale should be made of all such material and reported to the supervisor.

Penalty material should be scaled as promptly as practicable and in any case immediately after the completion of operations upon a logging unit.

Material subject to this requirement (penalty-scale clause, Form 202) will be scaled, stamped, and numbered as in the regular scale, and recorded as indicated on page 36.

Under the scaling-length clause of Form 202, logs overrunning the specified allowance for trimming will be scaled not to exceed the next foot in length. If a scaler finds frequent violations of the trimming overrun, he should notify the purchaser. If further violations occur, he should measure all logs and scale as 1 foot longer any pieces overrunning the trimming allowance. Penalty scaling of this character will be noted plainly in the scale book against the number of the log to avoid possible controversy.

## SETTLEMENT OF COMPLAINTS.

Complaints should be settled by a check scale. If the results of the first check are questioned upon apparently good grounds, a second check may be made by another scaler. It is the policy of the Forest Service to ascertain the justice of responsible complaints by a rescale conducted by a more competent and experienced scaler, not by lumber tallies or mill checks on the log scale. Complaints will be settled by mill checks only in extreme and exceptional cases where required by the defective character of the logs or other special local conditions.

#### CHECK SCALING.

The chief purpose of check scaling is to make and keep the current scale accurate by indicating sources of error and particularly by instructing scalers on the ground. Systematic check scaling, catching up the local scale often enough to insure its efficiency, is therefore a necessary part of the timber sales organization.

So far as practicable a check scale should be made at least once a year on every sale of 1,000,000 feet or more. Smaller sales should be checked as frequently as may be necessary to properly train the local officers in charge of them. Checking the scale of rangers who have but little sales work is of special importance, since the most serious errors occur in such cases.

As many logs as practicable should be scaled by the check scaler after they have been scaled by the officer in charge of the sale and without knowledge of his figures. The check will then be compared with the original scale. The log numbers and lengths of the original scale will be recorded in the check scaler's book and the pages cut out and filed in the supervisor's office with a copy of the

63745-15-2

check scaler's report. Check scale figures may be put in the following form:

	Sound logs.			Unsound logs.			Total.		
	Num- ber of logs.	Scale.	Per cent, + or 	ber of logs.	Scale.	Per cent, + or 	ber of logs.	Scale.	Per cent, + or 
Scale by Check scale by									·····

Ordinarily a check scale on 100 or 200 logs should come within 4 per cent, and on 400 to 500 logs within 3 per cent of the original scale. These percentages are intended simply as approximate standards of satisfactory scaling for the guidance of Forest officers, not as a basis for changing the original scale.

The findings of check scalers will be reported uniformly to the district forester. The original scale will be modified only when found to have been fundamentally wrong in method or in the treatment of important defects and when it is clear that serious injustice has been done to the purchaser. Changes will be made only with the approval of the district forester.

#### MILL SCALE STUDIES.

Aside from their occasional need for the settlement of complaints (see p. 25), mill scale studies should be made to obtain accurate data on lumber yields and overrun by grades for use in stumpage appraisals. Detailed working plans should be prepared and approved by the Forester before studies of this kind are initiated.

Wherever practicable, expecially in the case of defective timber, logs should be followed through the mill by scalers. The object of simple mill checks of this nature is (1) to train the scaler's judgment by seeing how individual defects open up in the logs and reduce the cut of sound lumber, and (2) to obtain a check on the total yield of lumber from logs containing various defects as compared with the scale. The amount to be deducted in scaling for particular kinds of defects is the most important thing to learn from such mill checks.

# SCALING FROM THE STUMP.

# Use of Stump Scales.

A stump scale is obviously less accurate than a scale of logs, even when measurements are most carefully made. Stump scales should never be used, therefore, when log scales are practicable. This method will be employed only in timber trespasses and other cases where the logs have been removed and a log scale is impossible.

#### In Timber Trespass.

The total log lengths cut from each tree should be measured in making a stump scale of a timber trespass. Often the indentation in the ground where the butt struck in felling can be located. From that point, which may be several feet from the stump, the total log length should be measured to the top, the direction of which can usually be determined by the undercut on the stump. The total length should be divided into logs in accordance with Taper Tables 9 or 10 on pages 67 and 68 of the Appendix, and the instructions on page 14. The diameter of each log should be ascertained from the table or estimated from the total length and the top and stump diameters. The scale of each log may then be obtained from a scale stick or Table 1 on page 40 of the Appendix. Merchantable timber left in tops, in high stumps, and in unused logs should be scaled and entered separately. After scaling each tree, the top of the stump and the butt of the top should be stamped "U.S." Deductions from the scale should be made for cull in accordance with the best data available for the class of timber concerned

Where the tops can not be identified or have been moved or destroyed by fire, the scale may be obtained from the best volume table available for the locality and species by reducing the diameter at the top of the stump to diameter breast high. Volume tables may be used in lieu of stump scales, particularly when heights can be checked on trees bordering the cutting, if the results of this method are believed to be more accurate.

Forest officers should use extreme care in scaling trespass timber, especially by a stump scale, and should keep complete notes of the method used. If the case is brought into court, the scale and methods used in detail must be introduced as legal evidence.

# In Sales by Estimate.

In sales by estimate the scale or estimate of each tree sold must be obtained. An accurate volume table, if available, may be used, or the dimensions of each log in the tree determined and its scale taken from a scale rule or the table on page 40 of the Appendix. Deductions should be made for cull in accordance with visible defects and the scaler's knowledge of the amount and character of defect common in timber of the region.

# CUBIC MEASUREMENTS.

#### Policy.

The cubic content of timber may be measured (1) by the cord or (2) by the cubic foot. Cubic-foot measurements may, for determining stumpage payments, be converted into cords or board feet in accordance with a converting factor specified in the contract.

# Merchantable Timber.

Standards of merchantability should be specified in contracts as in sales of saw timber. These standards should conform to the best trade practice for each species and class of material in the region and as far as practicable should cover the points specified on page 12 for material measured by log scale, namely: minimum length of merchantable pieces, minimum diameter, proportion of defective material admissible, and treatment of common defects in scaling.

# **Requirements of Purchasers.**

The requirements of purchasers will be similar to those in sawtimber sales. (See p. 13.) Ricks for cord measure must be sufficiently regular to permit reasonably accurate measurement.

In sales of shingle stock where the officer in charge may determine the number of bolts to the cord, purchasers should be required to rick bolts only in case of question as to the proper number or to check the number currently used.

## Check Measurements.

Check measurements will be made in accordance with the instructions for check scaling, page 25. The same procedure should be followed as regards the frequency of checks in sales of varying size, the methods of conducting and reporting the check, and action to rectify the original scale.

# Policy.

#### CORD MEASURE.

Fuel wood will ordinarily be sold by the cord. Pulpwood, shake and shingle bolts, cooperage bolts, furniture bolts, acid wood, and bark may be sold by the cord or by other units of measure common in the local trade. In sales of shake or shingle bolts the unit of measure will ordinarily be the sound cord—that is, sound material equivalent to one cord—rather than the measured cord which may include some defective material. This requires throwing in additional bolts to make up for defective parts of the bolts constituting a measured cord. The same rule may be followed in the case of other material sold by the cord, if desirable to draw the contract in this form.

If cord dimensions differing from the standard of 8 feet long, 4 feet wide, and 4 feet high, with a volume of 128 cubic feet, are to be used, they should be specified in the contract, as when the long cord, 8 by 4 by 5 feet, with a volume of 160 cubic feet, is to be used for pulpwood or bark, or widths narrower than 4 feet are to be used for fuel wood or bolts.

# Cord Measurements.

Measurements of ricks will be taken with a tape in feet and tenths. Where ricks are standing on slopes the length of the rick parallel to the slope will be measured and the height at right angles to this plane. If end stakes are used, the length of ricks should be measured one-half of the distance between top and bottom; otherwise, at two or more places to obtain a fair average. The height should be measured at several places to give the true average.

In sales of fuel wood where a majority of the pieces in a rick are 3 inches more or less than the standard lengths, the rick should be measured, computed, and charged for on its actual cubic contents.

In sales of bolts of specified dimensions the lengths should be checked sufficiently to make sure that they do not regularly overrun the allowance specified in the contract. If overrun is general, the procedure should follow that outlined under penalty scale on page 25.

To compute the number of standard cords of 128 cubic feet, in ricks 4 feet wide, multiply the height by the length of the rick in feet and divide by 32. If the length of the wood is greater or less than 4 feet, multiply length, width, and height and divide by 128.

# 30 THE SCALING OF NATIONAL FOREST TIMBER.

#### Stamping and Numbering.

Both the top and bottom of each rick and at least 12 pieces in each cord must be stamped. Each rick will be numbered. The measurements and contents of each rick should be entered opposite its number in the scale book. Where bolts are counted and the number per cord estimated by the Forest officer, each bolt should be stamped.

#### CUBIC-FOOT MEASURE.

#### Policy.

Sales by cubic foot measure will be encouraged in order to place timber measurements on a more exact basis and permit accurate comparison of scientific and practical data. It will be the standard policy of the Forest Service to sell pulpwood by the cubic foot, with a converting equivalent to cords or board feet named in the contract where necessary. The specification of a converting factor makes it possible, particularly in the case of fuel or pulpwood, to adjust the method of measurement to the form in which the material is cut. The basis of measurement in sales of other classes of material should be changed to the cubic standard whenever practicable.

#### Measurements.

Two measurements are necessary—the average diameter of the log at its middle point in inches and its total length in feet. The former may be secured by calipers and the latter by tape.

The average diameter of logs of irregular shape should be secured by averaging the greatest diameter with the one at right angles to it, or by averaging four measurements if necessary for accuracy. If this is impossible because of the position of the log, the scaler should obtain the best average possible from two or more diameter measurements. Proper deductions should be made for the thickness of the bark. Recorded diameters should be rounded off to the nearest inch above or below the actual measurement. Logs having a diameter exactly halfway between inches will be thrown to the next lower inch.

The length of logs should be obtained in feet. Lengths should be rounded off to the nearest foot above or below the actual measurement. Logs whose length is half way between feet should be thrown to the next lower foot. Pieces exceeding 40 feet in length should be measured as two logs of as nearly equal length as possible, and pieces exceeding 80 feet as three logs. When pieces are measured as two or more logs the contents allowed for the separate lengths should be added and the total recorded as one log.

The volume in cubic feet may be obtained directly from Table 4 on page 58 of the Appendix, which contains the solid contents of logs in cubic feet for average middle diameters from 3 to 60 inches, and for lengths from 4 to 40 feet.

Table 8 on page 66 of the Appendix gives the area in square feet of circles from 1 to 80 inches in diameter. This may be used for computing volumes in cubic feet, by multiplying the area of the middle cross section of the log in square feet by the length.

# Deductions for Defect.

Deductions for defect should be made, in cubic-foot measurements, in accordance with the general methods discussed for scaling saw timber, page 17. The solid volume in cubic feet of waste material, as determined by the surface dimensions of the defect in square or rectangular form, times its length, should be deducted from the total cubic volume of the log. Since no allowance is made for saw kerf in cubic measurement, the 20 per cent reduction required in determining net loss of log scale by the board foot does not apply in this case.

No deductions should be made in cubic-foot measurements for curve or sweep, crotches, knots, or other "sound" defects. Deductions should be made, however, for unsound defects of any character which affect the merchantability of the log for the particular product of the sale.

#### LINEAR MEASUREMENTS.

# Policy.

Lagging, posts, piling, fence poles, converter poles, telephone poles, stulls, and mine timbers may be sold by the linear foot.

## Merchantable Timber.

The instructions under "Definition of merchantable logs," page 12, should be followed. Timber sale contracts should specify the minimum length and top diameter of sticks classed as merchantable for each product. Maximum lengths and diameters should be designated in contracts under which higher prices are to be paid for products cut from the larger material. It is especially necessary in sales of cedar covering both poles and other products to specify the dimensions of material to be used for each product. (See Standard Clause 16, National Forest Manual, p. 26–S.)

Similar specifications should cover wherever necessary the amount and kinds of defect admissible in products sold by the linear foot or the character of the material held to be merchantable for these purposes. This is of special importance in the case of valuable products like telephone poles and stulls which usually require the best grades of timber. The current specifications of local associations of pole dealers and the like should be followed as regards the area of defect admitted in the butts of poles of various diameters and similar points affecting merchantability.

# **Requirements of Purchasers.**

The requirements of purchasers will be similar to those specified on page 13. If products sold by the linear foot are to be cut in several standard lengths, purchasers may be required to pile or deck each length separately, if practicable and necessary to permit economical measurement.

# Measurement.

Measurements of length only are required. Where pieces are cut in uniform, standard lengths, actual measurement is necessary only in doubtful cases and at short intervals to check the lengths employed by the choppers. When several products are cut in the same sale, or prices depend upon both diameter and length, a similar current check should be made of the diameter of linear-foot material.

The standard allowance for trimming in cutting telephone poles is 1 inch for each 5 feet of length. Penalty measurements for lengths in excess of the trimming allowance will follow the provisions of the contract in accordance with the procedure outlined under "Penalty scale," page 24. Wherever advisable, contracts should specify trimming allowances for other classes of material.
# **Board-foot Equivalents.**

If desirable, contracts may specify equivalents in a thousand feet board measure for a stated number of linear feet. (See Standard Clause 27, National Forest Manual, p. 27–S.) This facilitates the application of a flat stumpage rate. As a standard practice, however, it is preferable to require payment for such material on a linear-foot basis.

# Stamping and Numbering.

Each stick measured must be stamped on at least one end.

Each pile of material measured should be numbered with crayon in the case of lagging, posts, fence poles, converter poles, or other material where individual pieces are small and of little value. The number of pieces in each pile and their linear-foot contents will be entered opposite the pile number in the scale book. Large pieces, like telephone poles, piling, and 16-foot stulls, equivalent in value to saw logs, should each receive a number. The scale of each piece should be entered opposite its number in the scale book.

# Check Measurements.

Check measurements will be made in accordance with the instructions for check scaling, page 25, and for check measurements, page 28.

# Combined Linear and Diameter Measurements.

Where the market value of products like telephone poles and stulls varies widely in accordance with top diameter as well as length, a schedule of stumpage rates for the various lengths and sizes should be used. In such sales the top diameter of each piece must be accurately measured, an average diameter being obtained in the case of sticks of irregular shape. Diameters will be averaged to the nearest inch, unless taking the next lower inch has been agreed upon in advance with the purchaser and is specifically required by the contract. If different lengths are cut, they should be measured on not less than 25 per cent of the pieces. Every piece should be given a separate number and entry in the scale book, as in the case of saw logs.

# COUNTING.

# Policy.

Hewn ties sold by the piece, in accordance with the standard practice of the Forest Service, will be counted. Ties will also be counted in sales where their board-foot contents are specified by the agreement. In the exceptional cases in which ties are scaled the instructions under scaling will be followed. Shingle bolts will be counted when contracts specify that the number of bolts to the cord will be determined by the scaler.

Lagging, poles, posts, etc., will be counted when sold by the piece.

# Merchantable Timber.

The instructions under "Definition of merchantable logs," page 12, will be followed unless otherwise provided in the contract. Contract requirements should conform with the local market specifications of the product concerned. Special contract clauses should be used to designate unmistakably the maximum and minimum sizes of pieces which are to be counted rather than scaled. (See Standard Clauses 14 and 15, National Forest Manual, p. 26–S.) Such clauses should include any specifications as to defect or class of material necessary to establish beyond question what timber is merchantable for these products.

# **Requirements of Purchasers.**

The requirements of purchasers should be similar to those outlined on page 13.

## Stamping and Numbering.

When counted each stick of mine timbers, ties, posts, or poles must be stamped on at least one end.

Each pile of material must be numbered with crayon even though it will be removed immediately. The number of pieces will be entered opposite the number of the pile in the scale book.

## Check Measurements.

Check measurements will be made in accordance with the instructions under Check scaling, page 25, and Check measurements, page 28.

## WEIGHING.

Bark may be sold by the ton when this method accords with the best trade practice of the region and scales are available on which weights may be taken by Forest officers or checked when taken by agents of common carriers. If the long rather than the standard ton is to be used, this must be specified in the contract.

# **RECORDS AND REPORTS.**

## Scale Books.

The scale or measurement of logs of other material will be entered by scalers directly in the Scale Book, Forms 231, 651, 648, or 223, and Scale by check scalers in the Comparative Scale Book, Form 122. records will not be entered in other notebooks or on loose slips of paper to be transferred to scale books later, except under exceptional conditions where the cost of scaling would be materially increased or the purchaser seriously inconvenienced by adhering to the standard practice. Temporary scale records must be transferred to the regular scale book as soon as practicable and the temporary record fastened permanently to the page of the scale book on which the entries are made. The original scale books, after all entries have been made and checked, will be kept in the supervisor's office in all advertised sales, and in the ranger's office in unadvertised sales. Logs, pieces, or piles of material should be numbered and their scale, cubic contents, linear feet, number of sticks, or number of cords, with the other data called for on these forms, entered opposite each serial number in accordance with the instructions on numbering, pages 15, 30, 33, and 34.

When pieces are scaled as two or more logs the scale allowed for the separate lengths will be added and the total sum recorded as one log.

Similarly, when pieces are measured by the cubic foot as two or more logs, the dimensions of the whole piece should be entered under a single serial number, the cubic contents of the separate lengths added, and the total recorded as one log.

So far as scaling forms allow, the following information should be given for each class of material scaled, measured, or counted:

Saw timber: Serial number of each log, length, net scale, and deductions for defect.

Cord material: Serial number of each rick, dimensions of rick in feet and tenths, and its contents in cords and fractions of cords.

*Cubic-foot material:* Serial number of each log, its length in feet, middle diameter in inches, net contents in cubic feet, and deductions for defect.

*Linear material:* Serial number of each pile and number of pieces of specified class and lengths.

*Material counted:* Serial number of each pile and number of pieces, by special class and length if necessary.

*Material weighed:* Number of pounds or tons with identification by car shipment or otherwise.

Where no column is given for cull, the figure can be entered in the space for the net scale, inclosed in a circle, thus: ③. Entries of the diameter of saw logs and notes on the kind of defect are desirable, in addition to those specified above. They may be required in the discretion of the district forester.

Sample sheets of Forms 231, 231–D1, and 631, on pages 70, 72, 74, and 76 of the Appendix show the proper method of keeping scale records of sawtimber.

Sample sheets of Forms 231 and 231–D1 on pages 84 and 86 of the Appendix show standard methods of recording measurements and counts of telephone poles and piling sold by the linear foot and piece.

A sample sheet of Form 648 on page 88 of the Appendix shows the standard method of recording measurements and counts of mining timbers sold by the linear foot, and ties and posts sold by the piece.

A sample sheet of Form 231 on page 78 of the Appendix shows the standard method of recording cubic feet and cords.

A sample sheet of Form 651 on page 82 of the Appendix shows an excellent method of counting shingle bolts on an average number per cord and recording the count in cords.

A sample sheet of Form 648 on page 80 of the Appendix shows the standard method of recording measurements of fuel wood sold by the cord.

## Penalty Scale Records.

Separate scale books will be kept in large sales for material covered by penalty scale under the penalty-scale clause of the timbersale contract, Form 202. A separate record of such material will be kept in small sales. A single scale of all classes of timber subject to the penalty will be entered in this record, but separate entries must be carried for each class to which a different charge applies. Each set of entries should be given a heading indicating the charge applicable. The following may occur:

Material not previously scaled, to be charged for at double the stumpage rate.

Material not previously scaled, to be charged for at the regular, or single, stumpage rate.

In exceptional cases, material previously scaled, to be charged for at double rates.

The original log numbers of material in the latter class will be recorded in the penalty-scale record, the heading indicating that the regular stumpage prices has already been charged.

The record of penalty scale for overrunning trimming allowance under the scaling-length clause of Form 202 should be noted on the original scale sheets against the number of each log concerned.

## Check of Scale Books.

All additions and computations in scale books, including figures read from tables, will be checked either in the supervisor's or district office as the district forester may direct. If errors are found the necessary corrections will be entered on Form 820, supplementing the last scale report of record in the sale.

# Cutting Reports.

The Forest officer in charge will notify the supervisor when cutting begins on any advertised sale. The scale in all sales will be reported to the supervisor on Form 820, and a duplicate retained in the ranger's files. In unadvertised sales only the final report need be submitted to the supervisor. Cutting reports will be submitted in advertised sales while work is in progress, covering periods of one, two,-three, or four weeks, as may be required by the supervisor, but ordinarily ending on Saturday. Special dates may be set by supervisors for submitting cutting reports, as may be most convenient for them or for purchasers. As far as practicable the wishes and needs of purchasers should be met in fixing dates for the submission of reports.

# 38 THE SCALING OF NATIONAL FOREST TIMBER.

# Penalty Scale Reports.

Reports of penalty scale should be made separately from the regular scale. Separate reports may be submitted on Form 820, properly labeled, or, where small quantities of material are reported at infrequent intervals, entries may be made on the back of Form 820 under "Remarks." Whenever penalty scale is reported, the "Total previously reported," "Total since last report," and "Total to date" should be given. If separate Forms 820 are used, they should constitute an independent series. Entries under "Remarks" need be made only in reports for periods during which a penalty scale has actually been made and in the final report for the sale.

# Check and Record of Cutting Reports.

As cutting reports (Form 820) are received, they should be compared with the timber sales record card for errors in entries brought forward from the last report and for the correctness of the rates. All calculations will be checked and the information regarding the progress of the sale scrutinized. The date of the report, quantity of each class of material cut, reduced to feet board measure by approved converting factors, and total value of material cut since the last report and to date will be entered on the record card. The total value of the cut to date will be compared with the total deposits to prevent cutting in excess of payments.

# Scale Records for Purchasers.

Unless deemed inadvisable by the officer in charge or by the supervisor, the scale of individual logs, measurement of individual pieces or ricks, or count of particular piles of timber sale products should be given to purchasers upon request, either in person or by letter. Similarly, the complete scale record may be opened to the purchaser at any time in the presence of a Forest officer. Supervisors should inform purchasers of the scale to date at regular periods, either by letter or by furnishing approved cutting reports on Form 820 without entries on the back.

# Report of Timber Sold and Cut.

The monthly report on Form 949 will be mailed to the district forester by the supervisor not later than the fifth of the succeeding month, even if no timber has been sold or cut during the month. It will be compiled from all Forms 615, which will not be placed in the closed records until the end of the month. All timber for which payment is made, whether cut in sales, administrative use, or timber settlement, will be included. The date of approval of the agreement or stipulation will be taken in each case as the date of sale, even though an emergency sale may have been made in advance. The day when each cutting report is received will be taken as the date of cutting. All data will be checked before the report is forwarded. If a flat rate has been applied to green and dead timber, the two classes may be prorated in the scale report, Form 949, on the basis of their ratio in the original estimate.

The amount and value of the timber sold and cut, respectively, in sales at cost under Regulation S-22 will be reported separately.

The report should include a statement of the amount of timber previously reported as sold which will not be cut owing to cancellations or modifications of contracts during the month.

# District Forester's Menthly Report.

As soon as practicable after the first of each month the district forester will report to the Forester the amount and value of green and dead timber sold and cut respectively during the preceding month, by Forests. This report should include a statement of the amount of timber previously reported as sold which will not be cut owing to cancellations or modifications of contracts during the month.

It will not be necessary to include in this statement the "overcut" or "undercut" in sales which were closed during the preceding month.

# Annual Report.

The annual report will be compiled from the monthly reports.

# Report on Miscellaneous Products.

Sales of miscellaneous forest products, such as Christmas trees, naval stores, seedlings, etc., should be reported in a footnote to the district forester's monthly and annual report of timber cut and sold.

## TABLE 1.-SCRIBNER DECIMAL C LOG RULE.

# 6 TO 18 FOOT LOGS.

		Length-feet.												
	eter.	6	7	8	9	10	11	12	13	14	15	16	17	18
	Diam					Con	itents	—boa	rd fee	t in te	ns.			
1	ns 6 7 8 9 10	$0.5 \\ .5 \\ 1 \\ 1 \\ 2$	$   \begin{array}{c}     0.5 \\     1 \\     1 \\     2 \\     2   \end{array} $	$0.5 \\ 1 \\ 1 \\ 2 \\ 3 \\ 3$	$0.5 \\ 1 \\ 1 \\ 2 \\ 3 \\ 3 \\ 1 \\ 2 \\ 3 \\ 3 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$	$     \begin{array}{c}       1 \\       1 \\       2 \\       3 \\       3     \end{array}   $	$     \begin{array}{c}       1 \\       2 \\       2 \\       3 \\       3     \end{array}   $	$     \begin{array}{c}       1 \\       2 \\       2 \\       3 \\       3     \end{array}   $	$     \begin{array}{c}       1 \\       2 \\       2 \\       3 \\       4     \end{array} $	$     \begin{array}{c}       1 \\       2 \\       2 \\       3 \\       4     \end{array} $	$     \frac{1}{2}     \frac{2}{3}     5 $	$2 \\ 3 \\ 3 \\ 4 \\ 6$	2 3 3 4 6	2 $3$ $3$ $4$ $6$
	$11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20$	$2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 11$	$2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 12$	$     \begin{array}{c}       3 \\       4 \\       5 \\       6 \\       7 \\       8 \\       9 \\       11 \\       12 \\       14 \\       14 \\       \end{array} $	$     \begin{array}{r}       3 \\       4 \\       5 \\       6 \\       8 \\       9 \\       10 \\       12 \\       13 \\       16 \\     \end{array} $	$     \begin{array}{r}       4 \\       5 \\       6 \\       7 \\       9 \\       10 \\       12 \\       13 \\       15 \\       17 \\     \end{array} $	4 5 7 8 10 11 13 15 16 19	$     \begin{array}{r}       4 \\       6 \\       7 \\       9 \\       11 \\       12 \\       14 \\       16 \\       18 \\       21 \\     \end{array} $	$5 \\ 6 \\ 8 \\ 9 \\ 12 \\ 13 \\ 15 \\ 17 \\ 19 \\ 23$	$5 \\ 7 \\ 8 \\ 10 \\ 12 \\ 14 \\ 16 \\ 19 \\ 21 \\ 24$	$\begin{array}{c} 6 \\ 7 \\ 9 \\ 11 \\ 13 \\ 15 \\ 17 \\ 20 \\ 22 \\ 26 \end{array}$	$     \begin{array}{r}       7 \\       8 \\       10 \\       11 \\       14 \\       16 \\       18 \\       21 \\       24 \\       28 \\       \end{array} $	$     \begin{array}{r}       7 \\       8 \\       10 \\       12 \\       15 \\       17 \\       20 \\       23 \\       25 \\       30 \\       \end{array} $	8 9 11 13 16 18 21 24 27 31
•	$\begin{array}{c} 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \end{array}$	$12 \\ 13 \\ 14 \\ 15 \\ 17 \\ 19 \\ 21 \\ 22 \\ 23 \\ 25$	$     \begin{array}{r}       13 \\       15 \\       16 \\       18 \\       20 \\       22 \\       22 \\       24 \\       25 \\       27 \\       29 \\       29 \\       29 \\       20 \\       22 \\       24 \\       25 \\       27 \\       29 \\       29 \\       20 \\       20 \\       22 \\       24 \\       25 \\       27 \\       29 \\       29 \\       20 \\       20 \\       22 \\       25 \\       27 \\       29 \\       20 \\       20 \\       25 \\       27 \\       29 \\       29 \\       20 \\       20 \\       20 \\       25 \\       27 \\       29 \\       20 \\       20 \\       20 \\       20 \\       20 \\       20 \\       25 \\       27 \\       29 \\       20 \\$	$15 \\ 17 \\ 19 \\ 21 \\ 23 \\ 25 \\ 27 \\ 29 \\ 31 \\ 33$	$17 \\ 19 \\ 21 \\ 23 \\ 26 \\ 28 \\ 31 \\ 33 \\ 35 \\ 37 \\ 37 \\ 37 \\ 37 \\ 31 \\ 35 \\ 37 \\ 37 \\ 31 \\ 35 \\ 37 \\ 37 \\ 31 \\ 35 \\ 37 \\ 37 \\ 37 \\ 31 \\ 31 \\ 35 \\ 37 \\ 37 \\ 31 \\ 31 \\ 35 \\ 37 \\ 37 \\ 31 \\ 31 \\ 35 \\ 37 \\ 37 \\ 31 \\ 37 \\ 37 \\ 37 \\ 31 \\ 37 \\ 37$	$     \begin{array}{r}       19 \\       21 \\       23 \\       25 \\       29 \\       31 \\       34 \\       36 \\       38 \\       41 \\     \end{array} $	$21 \\ 23 \\ 26 \\ 28 \\ 31 \\ 34 \\ 40 \\ 42 \\ 45 \\ 45 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 1$	$23 \\ 25 \\ 28 \\ 30 \\ 34 \\ 37 \\ 41 \\ 44 \\ 46 \\ 49$	$25 \\ 27 \\ 31 \\ 33 \\ 37 \\ 41 \\ 44 \\ 47 \\ 49 \\ 53$	27 29 33 35 40 44 48 51 53 57	$28 \\ 31 \\ 35 \\ 38 \\ 43 \\ 47 \\ 51 \\ 54 \\ 57 \\ 62$	$\begin{array}{c} 30\\ 33\\ 38\\ 40\\ 46\\ 50\\ 55\\ 58\\ 61\\ 66\end{array}$	$32 \\ 35 \\ 40 \\ 43 \\ 49 \\ 53 \\ 58 \\ 62 \\ 65 \\ 70$	$34 \\ 38 \\ 42 \\ 45 \\ 52 \\ 56 \\ 62 \\ 65 \\ 68 \\ 74$
	31 32 33 34 35 36 37 38 39 40	27 28 29 30 33 35 39 40 42 45	$31 \\ 32 \\ 34 \\ 35 \\ 38 \\ 40 \\ 45 \\ 47 \\ 49 \\ 53$	$36 \\ 37 \\ 39 \\ 40 \\ 44 \\ 46 \\ 51 \\ 54 \\ 56 \\ 60$	$\begin{array}{c} 40\\ 41\\ 44\\ 45\\ 49\\ 52\\ 58\\ 60\\ 63\\ 68\\ \end{array}$	$\begin{array}{r} 44\\ 46\\ 49\\ 50\\ 55\\ 58\\ 64\\ 67\\ 70\\ 75\\ \end{array}$	$\begin{array}{c} 49\\ 51\\ 54\\ 55\\ 60\\ 63\\ 71\\ 73\\ 77\\ 83 \end{array}$	53 55 59 60 66 69 77 80 80 84 90	58 60 64 65 71 75 84 87 91 98	$\begin{array}{c} 62 \\ 64 \\ 69 \\ 70 \\ 77 \\ 81 \\ 90 \\ 93 \\ 98 \\ 105 \end{array}$		$71 \\ 74 \\ 78 \\ 80 \\ 88 \\ 92 \\ 103 \\ 107 \\ 112 \\ 120$	757883859398109113119128	$\begin{array}{c} 80 \\ 83 \\ 88 \\ 90 \\ 98 \\ 104 \\ 116 \\ 120 \\ 126 \\ 135 \end{array}$

	Lengtn—ieet.													
eter.	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Diam					Cor	itents	—boa	rd fee	t in t	ens.				
Ins. 6 7 8 9 10	2 3 3 4 7	2 3 3 4 7	2 3 4 5 7	3 4 4 5 8	3 4 4 5 8	3 4 4 6 9	3 4 5 6 9	3 4 5 6 9	4 5 5 7 10	4 5 6 7 10	4 5 6 8 11	4 5 6 8 11	5 6 7 9 12	5 6 7 9 12
11 12 13 14 15 16 17 18 19 20	8 9 12 14 17 19 22 25 28 33	8 10 12 14 18 20 23 27 30 35	9 10 13 15 19 21 24 28 31 37	$9 \\ 11 \\ 13 \\ 16 \\ 20 \\ 22 \\ 25 \\ 29 \\ 33 \\ 38$	$10 \\ 11 \\ 14 \\ 16 \\ 20 \\ 23 \\ 27 \\ 31 \\ 34 \\ 40$	$\begin{array}{c} 10\\ 12\\ 15\\ 17\\ 21\\ 24\\ 28\\ 32\\ 36\\ 42 \end{array}$	$11 \\ 12 \\ 15 \\ 18 \\ 22 \\ 25 \\ 29 \\ 33 \\ 37 \\ 44$	$11 \\ 13 \\ 16 \\ 19 \\ 23 \\ 26 \\ 30 \\ 35 \\ 39 \\ 45$	$\begin{array}{c} 12 \\ 13 \\ 16 \\ 19 \\ 24 \\ 27 \\ 31 \\ 36 \\ 40 \\ 47 \end{array}$	$12 \\ 14 \\ 17 \\ 20 \\ 25 \\ 28 \\ 32 \\ 37 \\ 42 \\ 49$	$\begin{array}{c} 13 \\ 14 \\ 18 \\ 21 \\ 26 \\ 29 \\ 33 \\ 39 \\ 43 \\ 51 \end{array}$	$13 \\ 15 \\ 18 \\ 21 \\ 27 \\ 30 \\ 35 \\ 40 \\ 45 \\ 52$	$14 \\ 15 \\ 19 \\ 22 \\ 28 \\ 31 \\ 36 \\ 41 \\ 46 \\ 54$	$14 \\ 16 \\ 19 \\ 23 \\ 28 \\ 32 \\ 37 \\ 43 \\ 48 \\ 56$
21 22 23 24 25 26 27 28 29 30	36 40 45 48 54 59 65 69 72 78	$38 \\ 42 \\ 47 \\ 50 \\ 57 \\ 62 \\ 68 \\ 73 \\ 76 \\ 82$	$\begin{array}{c} 40\\ 44\\ 49\\ 53\\ 60\\ 66\\ 72\\ 76\\ 80\\ 86\end{array}$	$\begin{array}{r} 42\\ 46\\ 52\\ 55\\ 63\\ 69\\ 75\\ 80\\ 84\\ 90 \end{array}$	44 48 54 57 66 72 79 84 88 94	$\begin{array}{c} 46 \\ 50 \\ 57 \\ 61 \\ 69 \\ 75 \\ 82 \\ 87 \\ 91 \\ 99 \end{array}$	$\begin{array}{r} 47\\52\\59\\63\\72\\78\\86\\91\\95\\103\end{array}$	49 54 61 66 75 82 89 95 99 107	$51 \\ 56 \\ 64 \\ 68 \\ 77 \\ 85 \\ 92 \\ 98 \\ 103 \\ 111$	$53 \\ 58 \\ 66 \\ 71 \\ 80 \\ 88 \\ 96 \\ 102 \\ 107 \\ 115$	55 60 68 73 83 91 99 105 110 119	$57 \\ 63 \\ 71 \\ 76 \\ 86 \\ 94 \\ 103 \\ 109 \\ 114 \\ 123$	59 65 73 78 89 97 106 113 118 127	$\begin{array}{c} 61 \\ 67 \\ 75 \\ 81 \\ 92 \\ 100 \\ 110 \\ 116 \\ 122 \\ 131 \end{array}$
31 32 33 34 35 36 37 38 39 40	84 87 93 95 104 110 122 127 133 143	89 92 98 100 109 115 129 133 140 150	93 97 103 105 115 121 135 140 147 158	$\begin{array}{c} 98\\ 101\\ 108\\ 110\\ 120\\ 127\\ 142\\ 147\\ 154\\ 166 \end{array}$	$\begin{array}{c} 102 \\ 106 \\ 113 \\ 115 \\ 126 \\ 132 \\ 148 \\ 153 \\ 161 \\ 173 \end{array}$	$\begin{array}{c} 106 \\ 110 \\ 118 \\ 120 \\ 131 \\ 138 \\ 154 \\ 160 \\ 168 \\ 181 \end{array}$	$\begin{array}{c} 111\\ 115\\ 122\\ 125\\ 137\\ 144\\ 161\\ 167\\ 175\\ 188\\ \end{array}$	$\begin{array}{c} 115\\ 120\\ 127\\ 130\\ 142\\ 150\\ 167\\ 174\\ 182\\ 196 \end{array}$	$\begin{array}{c} 120\\ 124\\ 132\\ 135\\ 148\\ 156\\ 174\\ 180\\ 189\\ 203 \end{array}$	$\begin{array}{c} 124\\ 129\\ 137\\ 140\\ 153\\ 161\\ 180\\ 187\\ 196\\ 211 \end{array}$	129 133 142 145 159 167 187 193 203 218	$\begin{array}{c} 133\\ 138\\ 147\\ 150\\ 164\\ 173\\ 200\\ 210\\ 226\\ \end{array}$	138 143 152 155 170 179 199 207 217 233	142 147 157 160 175 185 206 214 224 241

# TABLE 1.—SCRIBNER DECIMAL C LOG RULE.19 TO 32 FOOT LOGS.

42

## TABLE 1.-SCRIBNER DECIMAL C LOG RULE-Continued.

		Length-feet.												
	eter.	6	7	8	9	10	11	12	13	14	15	16	17	18
	Diam					Con	itents	—boa	rd fee	t in te	ens.			
		48 50 52 56 57 59 62 65 67 70	$56 \\ 59 \\ 61 \\ 65 \\ 66 \\ 69 \\ 72 \\ 76 \\ 79 \\ 82$	$\begin{array}{c} 64\\ 67\\ 70\\ 74\\ 76\\ 79\\ 83\\ 86\\ 90\\ 94 \end{array}$	$72 \\ 76 \\ 79 \\ 83 \\ 85 \\ 89 \\ 93 \\ 97 \\ 101 \\ 105 \\$	$79\\84\\87\\93\\95\\99\\104\\108\\112\\117$	$\begin{array}{r} 87\\ 92\\ 96\\ 102\\ 104\\ 109\\ 114\\ 119\\ 124\\ 129\\ \end{array}$	$\begin{array}{c} 95\\ 101\\ 105\\ 111\\ 114\\ 119\\ 124\\ 130\\ 135\\ 140\\ \end{array}$	$\begin{array}{c} 103 \\ 109 \\ 113 \\ 120 \\ 123 \\ 129 \\ 134 \\ 140 \\ 146 \\ 152 \end{array}$	$\begin{array}{c} 111\\ 117\\ 122\\ 129\\ 133\\ 139\\ 145\\ 151\\ 157\\ 164 \end{array}$	$119 \\ 126 \\ 131 \\ 139 \\ 143 \\ 149 \\ 155 \\ 162 \\ 168 \\ 175$	$\begin{array}{c} 127\\ 134\\ 140\\ 148\\ 152\\ 159\\ 166\\ 173\\ 180\\ 187\\ \end{array}$	$\begin{array}{c} 135\\ 143\\ 148\\ 157\\ 161\\ 169\\ 176\\ 184\\ 191\\ 199\\ \end{array}$	$143 \\ 151 \\ 157 \\ 166 \\ 171 \\ 178 \\ 186 \\ 194 \\ 202 \\ 211$
	$51 \\ 52 \\ 53 \\ 54 \\ 55 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60$	$73 \\ 76 \\ 79 \\ 82 \\ 85 \\ 88 \\ 91 \\ 95 \\ 98 \\ 101$	$85 \\ 89 \\ 92 \\ 96 \\ 99 \\ 103 \\ 107 \\ 110 \\ 114 \\ 118$	$\begin{array}{r} 97 \\ 101 \\ 105 \\ 109 \\ 113 \\ 118 \\ 122 \\ 126 \\ 131 \\ 135 \end{array}$	$\begin{array}{c} 110\\ 114\\ 118\\ 123\\ 127\\ 132\\ 137\\ 142\\ 147\\ 152 \end{array}$	$\begin{array}{c} 122\\ 127\\ 132\\ 137\\ 142\\ 147\\ 152\\ 158\\ 163\\ 169\\ \end{array}$	$\begin{array}{c} 134\\ 139\\ 145\\ 150\\ 156\\ 162\\ 167\\ 174\\ 180\\ 186 \end{array}$	$\begin{array}{c} 146 \\ 152 \\ 158 \\ 164 \\ 170 \\ 176 \\ 183 \\ 189 \\ 196 \\ 203 \end{array}$	$\begin{array}{c} 158 \\ 165 \\ 171 \\ 177 \\ 184 \\ 191 \\ 198 \\ 205 \\ 212 \\ 220 \end{array}$	$170 \\ 177 \\ 184 \\ 191 \\ 198 \\ 206 \\ 213 \\ 221 \\ 229 \\ 237 \\$	$183 \\ 190 \\ 197 \\ 205 \\ 212 \\ 220 \\ 228 \\ 237 \\ 245 \\ 253 \\$	$195 \\ 202 \\ 210 \\ 218 \\ 227 \\ 235 \\ 244 \\ 252 \\ 261 \\ 270 \\$	$\begin{array}{c} 207 \\ 215 \\ 224 \\ 232 \\ 241 \\ 250 \\ 259 \\ 268 \\ 278 \\ 287 \end{array}$	$\begin{array}{c} 219\\ 228\\ 337\\ 246\\ 255\\ 264\\ 274\\ 284\\ 294\\ 304 \end{array}$
the second secon	$\begin{array}{c} 61 \\ 62 \\ 63 \\ 64 \\ 65 \\ 66 \\ 67 \\ 68 \\ 69 \\ 70 \end{array}$	$\begin{array}{c} 105\\ 108\\ 112\\ 116\\ 119\\ 123\\ 127\\ 131\\ 135\\ 139 \end{array}$	$\begin{array}{c} 123 \\ 127 \\ 131 \\ 135 \\ 139 \\ 144 \\ 148 \\ 153 \\ 158 \\ 163 \end{array}$	$\begin{array}{c} 140\\ 145\\ 149\\ 154\\ 159\\ 164\\ 170\\ 175\\ 180\\ 186 \end{array}$	$\begin{array}{c} 158 \\ 163 \\ 168 \\ 174 \\ 179 \\ 185 \\ 191 \\ 197 \\ 203 \\ 209 \end{array}$	$\begin{array}{c} 175\\ 181\\ 187\\ 193\\ 199\\ 206\\ 212\\ 219\\ 226\\ 232 \end{array}$	$\begin{array}{c} 193 \\ 199 \\ 205 \\ 213 \\ 219 \\ 226 \\ 233 \\ 240 \\ 248 \\ 256 \end{array}$	$\begin{array}{c} 210\\ 217\\ 224\\ 232\\ 239\\ 247\\ 254\\ 262\\ 271\\ 279 \end{array}$	228 235 243 251 259 268 275 284 294 302	$\begin{array}{c} 245\\ 253\\ 261\\ 270\\ 279\\ 288\\ 297\\ 306\\ 316\\ 325 \end{array}$	$263 \\ 271 \\ 280 \\ 290 \\ 299 \\ 309 \\ 318 \\ 328 \\ 339 \\ 349 \\ 349 \\$	280 289 299 309 319 329 339 350 361 372	$\begin{array}{c} 298\\ 307\\ 317\\ 329\\ 339\\ 350\\ 360\\ 371\\ 384\\ 395 \end{array}$	$315 \\ 325 \\ 336 \\ 348 \\ 358 \\ 370 \\ 381 \\ 393 \\ 406 \\ 419$
	$71 \\ 72 \\ 73 \\ 74 \\ 75 \\ 76 \\ 77 \\ 78 \\ 79 \\ 80$	$\begin{array}{c} 144\\ 148\\ 152\\ 157\\ 161\\ 166\\ 171\\ 176\\ 180\\ 185 \end{array}$	$\begin{array}{c} 167\\ 173\\ 178\\ 183\\ 188\\ 194\\ 199\\ 205\\ 211\\ 216 \end{array}$	192 197 203 209 215 221 228 234 240 247	$\begin{array}{c} 215\\ 222\\ 329\\ 236\\ 242\\ 249\\ 256\\ 263\\ 271\\ 278\\ \end{array}$	$\begin{array}{c} 249\\ 247\\ 254\\ 261\\ 269\\ 277\\ 285\\ 293\\ 301\\ 309 \end{array}$	$\begin{array}{c} 263 \\ 271 \\ 280 \\ 288 \\ 296 \\ 304 \\ 313 \\ 322 \\ 331 \\ 340 \end{array}$	$\begin{array}{c} 287\\ 296\\ 305\\ 314\\ 323\\ 332\\ 341\\ 351\\ 361\\ 371 \end{array}$	$\begin{array}{c} 311\\ 321\\ 330\\ 340\\ 350\\ 360\\ 369\\ 380\\ 391\\ 402 \end{array}$	$\begin{array}{c} 335\\ 345\\ 356\\ 366\\ 377\\ 387\\ 398\\ 410\\ 421\\ 432\\ \end{array}$	$359 \\ 370 \\ 381 \\ 393 \\ 404 \\ 415 \\ 426 \\ 439 \\ 451 \\ 464$	$383 \\ 395 \\ 406 \\ 418 \\ 430 \\ 443 \\ 455 \\ 468 \\ 481 \\ 494$	$\begin{array}{r} 407\\ 419\\ 432\\ 445\\ 458\\ 470\\ 483\\ 497\\ 511\\ 526\\ \end{array}$	$\begin{array}{r} 430\\ 444\\ 457\\ 471\\ 484\\ 498\\ 511\\ 527\\ 541\\ 556\end{array}$

6 TO 18 FOOT LOGS-Continued.

# TABLE 1.-SCRIBNER DECIMAL C LOG RULE-Continued.

19 to 32 FOOT LOGS-Continued.

The state of the second second

See Man and Man

in the first

		Length-feet.												
ster.	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Diam	Contents—board feet in tens.													
Ins.														
41	151	159	167	175	183	191	199	207	215	223	230	238	246	254
42	159	168	176	185	193	201	210	218	227	235	243	252	260	208
43	166	174	183	192	200	209	218	227	236	214	255	202	270	278
44	1/0	180	194	204	215	222	201	241	250	209	203	210	201	30.
40	180	108	208	209	210	220	2.18	258	268	278	288	200	307	317
40	197	207	200	213	238	248	259	269	279	290	300	310	321	331
48	205	216	227	238	248	260	270	281	292	302	313	324	335	346
49	213	225	236	247	258	270	281	292	303	314	326	337	348	359
50	222	234	246	257	269	281	292	304	316	328	339	351	363	374
51	231	243	256	268	280	292	304	315	329	341	353	365	377	389
52	241	253	266	278	291	304	316	329	342	354	367	380	392	40
53	250	263	276	289	302	316	329	341	355	368	381	395	408	42
54	259	273	287	300	314	328	341	355	369	382	396	410	423	43
-55	269	283	297	312	326	340	354	368	382	397	411	425	439	4.54
- 56	279	294	309	323	338	303	307	382	397	411	420	441	455	4/1
- 04 80	289	215	320	000	262	270	201	410	411	420	492	473	412	50
50	310	297	2/3	350	276	302	408	425	441	442	474	490	506	52
60	321	338	355	372	389	406	422	439	456	473	490	507	524	54
61	332	350	368	385	403	420	438	455	473	490	508	525	543	56
62	344	362	380	398	416	434	452	470	488	506	524	542	561	57
63	355	373	392	411	429	448	467	485	504	523	541	560	579	59
64	367	387	406	425	445	464	483	503	522	541	561	580	599	61
65	378	398	418	438	458	478	498	518	538	558	578	597	617	63
66	391	412	432	453	473	494	515	535	556	576	597	617	638	65
67	402	423	445	466	487	508	529	550	572	593	614	635	656	67
- 68	415	437	459	480	502	524	546	505	590	011	633	677	200	09
$-59 \\ -70$	429 442	452	474 488	497	535	542 558	581	605	628	651	674	698	721	74
71	454	478	502	526	550	574	598	622	646	670	694	717	741	76
72	469	493	518	543	567	592	617	641	666	691	715	740	765	78
73	483	508	534	559	585	610	635	661	686	712	737	762	788	81
74	497	523	550	576	602	628	654	680	707	733	759	785	811	83
75	511	538	565	592	619	€46	673	700	727	754	781	807	834	86
76	526	553	581	609	636	664	692	719	747	775	802	830	858	88
77	540	568	597	625	654	682	710	739	767	796	824	852	881	90
78	556	585	614	644	673	702	731	761	790	819	848	878	907	93
79	572	602	632	662	692	722	752	782	812	842	872	902	933	96
80	587	618	649	680	711	742	113	804	835	806	897	927	958	98

44 THE SCALING OF NATIONAL FOREST TIMBER.

#### TABLE 1.-SCRIBNER DECIMAL C LOG RULE-Continued.

	Length—feet.												
eter.	6	7	8	9	10	11	12	13	14	15	16	17	18
Diam					Cor	ntents	—boa	rd fee	t in te	ens.			
Ins.													
81 82	190 196	$\frac{222}{228}$	$254 \\ 261$	$\frac{286}{293}$	$\frac{317}{326}$	$\frac{349}{358}$	$\frac{381}{391}$	413 424	444 456	476 489	$\frac{508}{521}$	$540 \\ 554$	572 586
83	201	234	268	301	335	368	401	434	468	501	535	568	601 618
85	200	240	275	316	351	- 386	421	456	491	526	561	596	631
86	215	251	287	<b>3</b> 23	359	<b>3</b> 95	431	467	5 <b>0</b> 3	539	575	611	646
87	$\frac{221}{226}$	258	295	332	368	405	442	479	516	553	589	626 640	663
89	$\frac{220}{231}$	270	308	347	385	424	462	501	539	578	616	655	693
90	236	275	315	354	393	433	472	511	551	590	629	669	708
91	2.11	282	322	362	102	443	483	523	563	604	644	684	725
92	246	288	329	370	411	452	493	534	575	616	657	698	740
93	251	293	335	377	419	461	503	545	587	629	671	713	755
94	257	300	343	386	428	4/1	525	- 569 - 569	600	656	700	728	788
96	268	313	357	402	446	491	536	581	625	670	715	759	804
97	273	319	364	410	455	501	546	592	637	683	728	774	819
98	278	325	$\frac{371}{270}$	418	464	511	557	603	650 662	696 710	743	789	830
100	$\frac{264}{289}$	338	386	434	482	531	579	627	675	724	772	820	869
101	005		000		100	F 41	500	000	000	500		0.00	005
101	295	344	393	443	- 492 509	559	= 590 E09	639	688	738	787	830	903
102	307	358	409	461	512	563	614	665	716	768	819	870	921
104	313	365	417	470	522	574	626	678	730	783	835	887	939
105	319	-372 270	425	479	532	- 585 500	638	$-691 \\ -704$	744	798	851	904	957 975
100	331	387	442	497	553	605	663	718	773	819 829	884	939	995
108	337	394	450	506	<b>5</b> 63	619	675	731	788	844	900	956	1,013
109	344	401	459	516	573	631	658	745	803	860	917	975	1,032 1,050
110	550	408	407	020	233	042	100	100	811	010	900	992	1,000
111	356	416	475	535	594	654	713	772	832	891	951	1,010	1,070
112	362	423	483	544	- 604 815	665	725	785	846	906	967	1,027 1.046	1,088 1,107
113	375	438	501	563	626	688	751	814	876	939	1,001	1,064	1,127
115	382	446	509	573	637	700	764	828	891	955	1,019	1,082	1,146
116	389	454	519	584	648 660	-713 796	778	843	908	973	1,037 1.056	1,102 1 199	1,167 1,188
118	- <del>390</del> - 403	402	537		672	$\frac{720}{734}$	500	873	924	1.008	1,030 1.075	1, 122 1, 142	1,100 1,209
119	410	478	547	615	683	752	820	888	957	1,025	1,093	1,162	1,230
120	417	487	556	626	695	765	834	904	973	1,043	1,112	1,182	1,251
	1	1				l	1						

6 TO 18 FOOT LOGS-Continued.

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# TABLE 1.-SCRIBNER DECIMAL C LOG RULE-Continued.

#### 19 TO 32 FOOT LOGS-Continued.

	Length-feet.													
eter.	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Contents—board feet in tens.														
Ins. 81 82 83 84 85 86 87 88 89 90	603 619 635 652 667 682 700 716 732 747	635 652 668 687 702 718 737 753 770 753 770 787	667 684 702 721 737 754 774 791 809 826	699 717 735 755 772 790 810 829 847 865	730 749 769 790 807 826 847 866 886 903	762 782 802 824 842 852 884 904 924 944	794 815 835 858 877 898 921 942 963 983	826 847 869 932 934 958 979 1,001 1,023	857 880 902 927 947 970 995 1,017 1,040 1.062	859 912 936 961 982 1,006 1,031 1,055 1,078 1,101	.921 945 969 996 1,017 1.042 1,068 1,092 1,117 1,141	$\begin{array}{c} 953\\ 977\\ 1,002\\ 1,030\\ 1,052\\ 1,077\\ 1,105\\ 1,130\\ 1,155\\ 1,180\end{array}$	984 1,010 1,036 1,064 1,108 1,113 1,142 1,168 1,194 1,219	$1,016 \\1,043 \\1,069 \\1,099 \\1,123 \\1,149 \\1,179 \\1,205 \\1,232 \\1,259$
91 92 93 94 95 96 97 98 99 100	765 781 796 814 831 849 865 882 899 917	805 822 838 857 875 893 910 928 947 965	845 863 880 910 919 938 956 975 994 1,013	886 904 922 942 943 983 1,001 1,021 1,041 1,041	926 942 964 985 1,006 1,027 1,047 1,068 1,089 1,110	966 980 1,006 1,028 1,050 1,072 1,072 1,092 1,114 1,136 1,158	$\begin{array}{c} 1,006\\ 1,027\\ 1.048\\ 1.071\\ 1,094\\ 1,117\\ 1,138\\ 1,160\\ 1,183\\ 1,206\end{array}$	$\begin{array}{c} 1,047\\ 1,068\\ 1,090\\ 1,114\\ 1,138\\ 1,161\\ 1,183\\ 1,207\\ 1,231\\ 1,255\end{array}$	$\begin{array}{c} 1,087\\ 1,109\\ 1,132\\ 1,157\\ 1,181\\ 1,206\\ 1,229\\ 1,253\\ 1,278\\ 1,278\\ 1,303 \end{array}$	$\begin{array}{c} 1,127\\ 1,150\\ 1,174\\ 1,199\\ 1,225\\ 1,251\\ 1,274\\ 1,300\\ 1,325\\ 1,351 \end{array}$	$1,167\\1,191\\1,216\\1,242\\1,269\\1,295\\1,320\\1,346\\1,373\\1,399$	$\begin{array}{c} 1,208\\ 1,233\\ 1,258\\ 1,285\\ 1,313\\ 1,340\\ 1,365\\ 1,392\\ 1,420\\ 1,448 \end{array}$	$\begin{array}{c} 1,248\\ 1,274\\ 1,299\\ 1,328\\ 1,356\\ 1,385\\ 1,411\\ 1,439\\ 1,467\\ 1,496\end{array}$	$1,288 \\1,315 \\1,341 \\1,371 \\1,400 \\1,429 \\1,456 \\1,485 \\1,515 \\1,544$
101 102 103 104 105 100 107 108 109 110	$\begin{array}{c} 934\\ 953\\ 972\\ 991\\ 1,010\\ 1,029\\ 1,050\\ 1,069\\ 1,089\\ 1,108\end{array}$	$\begin{array}{r} 983\\ 1,003\\ 1,023\\ 1,043\\ 1,063\\ 1,083\\ 1,105\\ 1,125\\ 1,125\\ 1,147\\ 1,167\end{array}$	$\begin{array}{c} 1,033\\ 1,054\\ 1,075\\ 1,096\\ 1,117\\ 1,138\\ 1,160\\ 1,181\\ 1,204\\ 1,225\\ \end{array}$	$\begin{array}{c} 1,082\\ 1,104\\ 1,120\\ 1,148\\ 1,170\\ 1,192\\ 1,210\\ 1,238\\ 1,261\\ 1,283\\ \end{array}$	$\begin{array}{c} 1,131\\ 1,154\\ 1,177\\ 1,200\\ 1,223\\ 1,246\\ 1,271\\ 1,294\\ 1,319\\ 1,342\\ \end{array}$	$\begin{array}{c} 1,180\\ 1,204\\ 1,228\\ 1,252\\ 1,276\\ 1,300\\ 1,326\\ 1,350\\ 1,350\\ 1,376\\ 1,400 \end{array}$	$\begin{array}{c} 1,229\\ 1,254\\ 1,279\\ 1,304\\ 1,329\\ 1,354\\ 1,381\\ 1,40\\ 1,438\\ 1,458 \end{array}$	$\begin{array}{c} 1.278\\ 1.304\\ 1.330\\ 1.356\\ 1.356\\ 1.382\\ 1.408\\ 1.408\\ 1.437\\ 1.468\\ 1.491\\ 1.517\end{array}$	$\begin{array}{c} 1,328\\ 1,355\\ 1,382\\ 1,409\\ 1,436\\ 1,402\\ 1,519\\ 1,519\\ 1,548\\ 1,575\end{array}$	$\begin{array}{c} 1,377\\ 1,405\\ 1,433\\ 1,461\\ 1,489\\ 1,517\\ 1,517\\ 1,547\\ 1,575\\ 1,605\\ 1,633 \end{array}$	$\begin{array}{c} 1,426\\ 1,455\\ 1,484\\ 1,513\\ 1,542\\ 1,571\\ 1,602\\ 1,631\\ 1,663\\ 1,692 \end{array}$	$\begin{array}{c} 1,475\\ 1,505\\ 1,535\\ 1,565\\ 1,595\\ 1,625\\ 1,658\\ 1,688\\ 1,688\\ 1,720\\ 1,750 \end{array}$	$\begin{array}{c} 1,524\\ 1,555\\ 1,586\\ 1,617\\ 1,648\\ 1,679\\ 1,713\\ 1,744\\ 1,777\\ 1,808 \end{array}$	$1,573 \\1,605 \\1,637 \\1,669 \\1,701 \\1,733 \\1,768 \\1,800 \\1,835 \\1,867$
111 112 113 114 115 116 117 118 119 120	1, 129 1, 148 1, 169 1, 210 1, 232 1, 254 1, 276 1, 298 1, 321	$1,188\\1,208\\1,230\\1,252\\1,273\\1,297\\1,320\\1,343\\1,367\\1,390$	$\begin{array}{c} 1,248\\ 1,269\\ 1,292\\ 1,314\\ 1,337\\ 1,362\\ 1,386\\ 1,411\\ 1,435\\ 1,460\\ \end{array}$	$\begin{array}{c} 1,307\\ 1,329\\ 1,353\\ 1,377\\ 1,401\\ 1,420\\ 1,452\\ 1,478\\ 1,503\\ 1,529\end{array}$	$\begin{array}{c} 1.367\\ 1.390\\ 1.415\\ 1.439\\ 1.464\\ 1.491\\ 1.518\\ 1.545\\ 1.572\\ 1.579\\ 1.599\end{array}$	$\begin{array}{c} 1,426 \\ 1,450 \\ 1,476 \\ 1,502 \\ 1,528 \\ 1,556 \\ 1,584 \\ 1,612 \\ 1,640 \\ 1,668 \end{array}$	$1,485 \\1,510 \\1,538 \\1,565 \\1,592 \\1,621 \\1,650 \\1,679 \\1,708 \\1,738 \\$	1,545 1,571 1,599 1,627 1,655 1,686 1,716 1,776 1,777 1,807	$\begin{array}{c} 1,604\\ 1,631\\ 1,601\\ 1,600\\ 1,719\\ 1,751\\ 1,782\\ 1.814\\ 1,845\\ 1,877\end{array}$	$\begin{array}{c} 1,664\\ 1,692\\ 1,722\\ 1,752\\ 1,753\\ 1,815\\ 1,848\\ 1,881\\ 1.913\\ 1,946 \end{array}$	$1,723 \\ 1.752 \\ 1.784 \\ 1.815 \\ 1.846 \\ 1.880 \\ 1.914 \\ 1.948 \\ 1.982 \\ 2,016 $	$1,783 \\ 1,813 \\ 1,845 \\ 1,878 \\ 1,910 \\ 1,945 \\ 1,980 \\ 2,015 \\ 2,050 \\ 2,085 $	$1,842 \\1,873 \\1,907 \\1,940 \\1,974 \\2,010 \\2,046 \\2,082 \\2,118 \\2,155 \\$	1,901 1,933 1,968 2,003 2,037 2,075 2,112 2,149 2,187 2,224

46

 TABLE 2.—CULL FOR RECTANGULAR DEFECTS.

 [20] per cent deducted for kerf from solid board foot contents.]

# THE SCALING OF NATIONAL FOREST TIMBER.

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	31		-00000	00440000	400000011
			-0000	010044101061-	400000000
	- 8		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0,000,410,400	40000-8000
			0000HH	01000441000	44000000
	12			0,000,44,10,10,60	4400000000
	98			0,00,4,4,0,00	n4n00⊳××00
	52		20011	00044400	840001-1-86
	24		000	0101000441010	0.440001-00
	8		00000	0,0,0,0,4,4,0,0	044000000000000000000000000000000000000
	53		00	010100044440	0.441010061-00
	21			010100004440	004400000
	20	ens.		0,0,0,00,4,4,4	004400962
eet.	19	in t	00000	0101010000044	00440000
Ţ	18	eet	5-11-0	-0000044	010004400000
lefer	1	rd 1		- 0.01000007	
of d		-boa	10		
gth		ts-	61111	-0000004	01000444000
Len	15	ten			0,0,0,0,4,4,4,0,0
	14	Cor	$1.5 \\ 1.5 $		0101000044440
	<u> </u>				000000440
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			11 0	0000000	0,0,0,0,0,0,4,4,4
	=		11.0		
ļ	10		1.0.2	00000	
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	0,0,000,0444400000	000444000000 000
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0,000,04,4,4,0,000	644440000000000000000000000000000000000	400000000000000000000000000000000000000
<u></u>	<u>644703867788099</u>	400022000000000000000000000000000000000
		000000000000000000000000000000000000000
88446690222	440000000000000000000000000000000000000	355-000884465
m44400001000	4000000000000000000	001xxx0001312121212121212121212121212121212121
64400000000000000000	4299288600133884	6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
84656677888	000××∞00000000000000000000000000000000	122222222222
440000008000	165144110999846655 16514445110999846655	78887 110 110 110 110 110 10 10 10 10 10 10 1
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4.0.007280001	8765555855000000000000000000000000000000	19 19 19 19 19 19 19 19 19 19 19 19 19 1
400000000000000000000000000000000000000	18871651182110 988706 188716511822110 988706	800115151458558608
4.00 110 120 120 120 120 120 120 120 120 1	1988715511110 1988715511110 1988715511110	220187655453215698
12115988465123	20987776554269846	9 11 11 11 11 11 11 11 11 11 11 11 11 11
132211010 132211011 1322111011	22252525252525252	2219211651110 22192111111111110 22192111111111111
00000000000000000000000000000000000000	222858545555555555555555555555555555555	22222099115111200 222222222222222222222222222222
00F80000-004	×*************************************	20000000000000000000000000000000000000
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02 00 0 0 0 0 7 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0	202202020202020202000 20220202020202020	29495666666666666
	0000402000004020	000000000000000000

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THE SCALING OF NATIONAL FOREST TIMBER.

	32		33.33	211022222222222828264 <b>44886</b> 23
	31		35.33.30	£11882222222222222222222222222222222222
	30		31 29	492722222222222222222222222222222222222
	50		$332 \\ 332 $	44444444444444444444444444444444444444
	58	-	330.23	$\begin{array}{c} 1113\\ 4542\\ 45333\\ 333333$
	27		3028	4440 333 332 22 22 22 12 12 13 445 33 33 33 32 22 22 22 22 22 22 22 22 22
	26		2222329	440 333 33 32 28 28 28 28 28 28 28 28 28 28 28 28 28
	25		$^{226}_{23}$	40 33 33 32 32 22 22 22 22 22 22 22 22 22
	24		25 25 25 25 25	3333333228225623233333333333333333333333
	23		$2523 \\ 2523 \\ 255 \\ 256 \\ 25$	338333298256555555528841665555
	53		25423	121112528888888888888888888888888888888
	21		2332	32338222222222222222222222222222222222
	8	us.	2222	333222222222222222222222222222222222222
et.	19	1 tei	$^{26}_{28}^{20}_{21}$	<b>8</b> 2822252522222222222222222222222222222
-le	18	et ir	$^{18}_{20}$	28222222222222222222222222222222222222
efect	17	rd fe	117 117 119	228825282828282828282828282828282828282
p Jo I	16	-boa	16 17 18	86822222222222222222222222222222222222
ngth	15	ents-	1201125	242222201988811655144220009887
I.e	14	Cont	14 15 16	22222001117166655423333551100098777
	13		15 15 13	212209998888776 21220998888776 21220998888776
	12		2222	10087176555433355515000×8×4¢¢¢
	п		12221	846655548335551559998846665
	10		9933	65554455559999877466555 65555445555
	G		9 0 10 10	4.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0
	~		<b>00000</b> 00	440000004440000000000000000000000000000
	2		1-1-00.00	×444000000111
	9		-1000	00444440000000000000000000000000000000
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			- কাকাকাকা	<u> </u>
	End dimen- sious.		Inches. 7 x 21 22 23 24	8 x 9. 10. 11. 11. 11. 11. 11. 11. 11. 11. 11

TABLE 2.-CULL FOR RECTANGULAR DEFECTS-Continued.

× 6	201
328222825252525252525252525555555555555	30.2882288228825 30.28822882288228822882288228822882288228
0,000,004444400000000000000000000000000	000444400000000000000000000000000000000
ю ю <del>4</del> 4 4 ю ю ю 0 0 0 г- г- г- 0 0 0 0 0 0 0 0	444000000000000000000000000000000000000
<u>4440000000000000000000000000000000000</u>	4 5 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8222110009988884446665695	4433355511555000000111555600
4488825555500998894 <b>46</b> 6555	0007447550 000111225554445559
811666544433311100000000	0999811295555533355556°°°°
	22222222222222222222222222222222222222
	20000000000000000000000000000000000000
	00000000000000000000000000000000000000
00000000000000000000000000000000000000	00-00840900-0000-0004000
80010004900588085508449	0100499022200499508
228888888888888888888888888888888888888	1222429282888848888
2822822828282828282828282828282828282828	222222222222222222222222222222222222222
383828283855868449484888	333 33 33 28 28 28 28 28 28 28 28 28 28 28 28 28
	88888888888888888888888888888888888888
	4-9-9-8-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-
11111111111111111111111111111111111111	6613388888870870870870870870 6613888888888870870870870870
53 33 33 33 33 33 35 35 35 35 35 35 35 3	44444444444444444444444444444444444444
11111111111111111111111111111111111111	12822222222222222222222222222222222222
<b>*************************************</b>	88828282828282828888888888888888888888
544683888333822222288884444	$\begin{smallmatrix} 50 \\ 50 \\ 50 \\ 50 \\ 50 \\ 50 \\ 50 \\ 50 $
11122222222222222222222222222222222222	$\begin{smallmatrix} 550 \\ 55$
<b>6</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b>	552 550 552 552 552 552 552 552 552 552
$\begin{array}{c} 111\\ 222\\ 222\\ 222\\ 222\\ 222\\ 222\\ 222$	56 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
222222222222222222222222222222222222222	8264250884444448333328282828 8664244444444833332828282833
75256844588888888888888888888888888888888	8285522588844448888388585555558888
5525558855245533333328286222555555555555555555555555	6000000000000000000000000000000000000
$\begin{array}{c} 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\$	222555514444444525555555555555555555555

63745-15-3

**4**9

50

TABLE 2.-CULL FOR RECTANGULAR DEFECTS-Continued.

THE SCALING OF NATIONAL FOREST TIMBER.

		4		* · · · · · · · · · · · · · · · · · · ·	44000000
		5		400000000000000000000000000000000000000	00001-1000
		9		33355111555999884446665	00000000000000
1		2		002748	1200000011
		~		88 111 112 112 112 112 112 112 112 112 1	80011008 132211000
1		6		80022222222222222222222222222222222222	100 110 110 100 100 100 100
		10		82288885588555885888888888888888888888	615253210
		Ħ		8838355 <u>86836555555555555555555555555555</u>	122243928
		12		2882222229588555655555555 888222222222222222222222	12 11 11 11 12 12 12 12 12 12 12 12 12 1
		13		88878885386188198 88878855866184191 88878855866184191	11 12 13 13 13 13 13 13 13 13 13 13 13 13 13
	Г	14	Con	31025255252525252525252525252525252525252	$     \begin{array}{c}       15 \\       17 \\       19 \\       21 \\       22 \\$
	engt	15	tents	33333888888888888888888888888888888888	2222225122
	h of	16	-pc	85333 <b>3688788</b> 873555555299255	22222019871 222222222222222222222222222222222222
	defec	11	bard	38232282828282828288	$^{15}_{276}$
	t –	18	feet	68833888888888888888888888888888888888	222222222222222222222222222222222222
	эеt.	19 2	in te	4493333333333888888888888 449488833333338888888888	3222822220
		0 21	ns.		220226222
		22		22222222222222222222222222222222222222	2332004257522
		23		88888888888888888888888888888888888888	33333128828
		24		522655666666666888888888888888888888888	$^{225}_{233}$
		25 2		22222222222222222222222222222222222222	$ \frac{1}{2} $
		6 2		22222122824444444	12022222222222222222222222222222222222
		1 28		0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,	000000444
				600012221444449333355 600012221444449333555	6 4 4 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
		30		8 8 8 8 8 8 9 4 4 4 4 8 8 5 8 8 5 8 5 8 5 8 5 8 5 8 5	<u> </u>
		31		2588888844448558686555568	88834448
		32		286686444444666666666666666666666666666	88844965

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256	$\begin{array}{c} 33 \\ 44 \\ 55 \\ 55 \\ 55 \\ 55 \\ 55 \\ 55 \\$	$\begin{array}{c} 45\\ 551\\ 552\\ 66\\ 66\\ 66\\ 66\\ 66\\ 65\\ 752\\ 752\\ 81\\ 81\\ 81\\ 81\\ 81\\ 81\\ 81\\ 81\\ 81\\ 81$
$^{252}_{-12}$	$\substack{3.2\\8.1}{3.2}$	$\begin{array}{c} \textbf{4}\\ \textbf{4}\\ \textbf{4}\\ \textbf{5}\\ \textbf{5}\\$
2000000000000000000000000000000000000	727206666667555594 727206666667555594 78530666666755559	232025555555555555555555555555555555555
7056638888555 70766538888 7076653888	32355555555555555555555555555555555555	14444555665558655
647 555 556 558 558 559 559 559 559 559 559 559 559	$\frac{1}{2}$ $\frac{1}$	30 30 30 30 30 30 30 30 30 42 42 30 30 42 42 30 50 50 50 50 50 50 50 50 50 5
$\begin{array}{c} 445 \\ 653 \\$	8882444444488828888 888	86444868888888888888888888888888888888
622662564464	858222525256666	8632555555555555555555555555555555555555
603552250846608608608608608608608608608608608608608	855555444465555555	55555555555555555555555555555555555555
$550 \pm 664$	6665555555 <b>644466</b> 6555555	$3.33\\ 4.52\\ 5.$
55320	88822884444486624888	2555594457595555555555555555555555555555
53355 54 54 58 55 53 33 35 55 55 55 55 55 55 55 55 55	2525255444485525555	$\begin{smallmatrix} & 3.3\\ & 5.5$
332	525256666666666666666666666666666666666	82555555555555555555555555555555555555
45550000000000000000000000000000000000	5554454445333322282525252525252525252525252525252	$80.53\\80.54\\80.56\\80$
464410	88888888884444444	$\begin{smallmatrix} 2 & 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 &$
$\substack{450}{120}$	2222288888888444444	52523333232 22222 22222 22222 22222 22222 22222 2222
41	222222222222222222222222222222222222222	4442888888884444 44488888888888884444
821823325258 33182332558 321825258 321825258 3218255 32185555 3218555 32185555 32185555 32185555 32185555 32185555 32185555 321855555 3218555555555555555555555555555555555555	42 9 3 3 3 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5	22222888888899 9
888883338658888888888888888888888888888	388888333885555558 38888833885555558	2222282828288888888
3333333358258	333433330882335555551082	8282828888888888888888888888888888888
33388418855835 33388418855835	22222222222222222222222222222222222222	333335855555555555 3333358555555555 335355555555
8828833328	33888888888888888888888888888888888888	22822222222222222222222222222222222222
8888 <b>5</b> 8888888	E12555858588588588	828888888888 <sup>2</sup> 888888888888888888888888
222222222222222222222222222222222222	88888888888888888 <u>28828888888888888888</u>	25 22 29 19 8 17 16 27 23 23 29 19 8 17 16 28 23 23 23 20 19 8 17 28
$\begin{array}{c} 15\\16\\17\\19\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22$	23222200218516615411322112 2332220021985166115411322113	2222299918811661113 2222299918811661113 22222999918811661113
19 19 19 19 19 19 19 19 19 19 19 19 19 1	2200 220 220 220 220 20 220 20 20 20 20	2019 112 112 112 112 112 112 112 112 112 1
16665555533222	8871666555112009 8 8871666555112222222222	0110102444309118
0110000044	00000000000000000000000000000000000000	8 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
8660001100	20022200000000000000000000000000000000	
1000000000000000	100000000000000000000000000000000000000	999920000000000000000000000000000000000
88888888888888888888888888888888888888	13 x 14 x 15 15 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16	14 x 15. 16. 16. 17. 17. 19. 22. 22. 22. 23. 23. 23. 23. 23. 23. 23

51

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THE SCALING OF NATIONAL FOREST TIMBER.

	32		8 78 88 90 82	$\substack{554554}{5586}$	$\substack{53\\65}{61}$
	31		818 878 878	$50\\53\\53\\53\\53\\53\\53\\53\\53\\53\\53\\53\\53\\53\\$	28288888
	30		× z ż	98288888888888888888888888888888888888	$\frac{54}{128}$
	29		76 81 81	<b>8</b> , <b>8</b>	555 556 559 559 559 559 559 559 559 559
	8		3,9,3	$\substack{882.259}{881}, \substack{882.259}{730}, \substack{822.259}{730}, 82$	138653555
	27		2832	$\substack{818}{818} \\ 818 \\ 81$	66 5 5 5 5 5 7 <del>5</del> 5 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
	26		13 68	3444898699888686868	555 555 550 550 550 550 550 550 550 550
	25		65 68 70	$\begin{array}{c} 7220855255555555555555555555555555555555$	$\frac{45}{56}$
	54		833	232555555555555555	$ \begin{array}{c} 44\\ 46\\ 54\\ 56\\ 61\\ 61\\ 61\\ 61\\ 61\\ 61\\ 61\\ 61\\ 61\\ 6$
	23		629	662666655555554444255555555555555555555	$550 \pm 523 \pm 523$
	22		57 60 62	555 + 44 + 84 + 555 + 56 + 56 + 56 + 56 + 56 + 56 +	564559455645555555555555555555555555555
	21		55 57 59	22222222222222222222222222222222222222	$^{22}_{24}$
	20	ns.	52 54 56	$\overset{\circ}{,}$	$     \begin{array}{c}       38 \\       38 \\       38 \\       45 \\       47 \\       45 \\       45 \\       45 \\       45 \\       51 \\       49 \\       51 \\      51 \\      51 \\       51 \\       51 \\       51 \\       51 \\  $
eet.	19	n te	51 50	$5255554 \pm 6 \pm 1 \pm 5333 \pm 3333$	$\frac{33}{26}$
Ţ	18	et i	47 49 50	5255544444453365335454465336555555555555	$\begin{array}{c} 333 \\ 446 \\ 46 \\ 46 \\ 46 \\ 46 \\ 46 \\ 46$
lefec	12	d fe	44 18 18	222 28 28 28 28 44 4 4 4 4 4 4 4 4 4 4 4	$\frac{1}{2}$
p Jo t	16	-boar	\$ <b></b> \$\$\$	822885586646448	52 <u>5</u> 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
engtl	15	nts-	39 14 13	222288888888894444	5121 8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Ľ	11	onte	33 35 39	92928888888888888888888888888888888888	222882828
	13	0	35 35 36	29892228828588888	2232222228
	12		15 55 55 15 55 15 55 15 55 15 55 15 55 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 1	28382938388882588	222222282
	11		$\frac{29}{31}$	#192929827288282828	82222228
	10		$^{26}_{28}$	87858282882888888	228282828
	6	į	2225	1237555828288828882	322225555
	00		2222	¥332228282828282828	202138116515 202138116515 2021381165
	2		20 19 20	12222555555555555555555555555555555555	1212123
	9		17	0011338844598778	122222222
	5		13 14 14	880000133324443	099113388 0
	4		11	12211155599988884446	P 8 8 9 9 9 8 8 4 1
	End dimen-		Inches. 14 x 28 30	15 x 16 177 18 18 18 18 18 28 29 28 29 28 29 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	16 x 17. 18. 19. 20. 21. 23. 24.

TABLE 2.-CULL FOR RECTANGULAR DEFECTS-Continued.

52

53883888 19888888888888888888888888888888	$66\\69\\76\\91\\98\\98\\98\\98\\98\\98\\98\\98\\98\\98\\98\\98\\98\\$	$73\\81\\83\\88\\92\\92\\92\\100\\100\\111\\111\\111\\115$	$^{82}_{97}$
*****	$\substack{ \begin{array}{c} 63\\ 67\\ 77\\ 77\\ 95\\ 95\\ 95\\ 95\\ 95\\ 95\\ 102\\ 102\\ 102\\ 102\\ 102\\ 102\\ 102\\ 102$	$\begin{smallmatrix} 77\\78\\86\\89\\93\\100\\1108\\112\\112\\112\\112\\112\\112\\112\\112\\112\\11$	$^{70}_{102}$
****	$\begin{smallmatrix} 666\\ 658\\ 725\\ 728\\ 828\\ 828\\ 828\\ 828\\ 828\\ 828\\ 828$	$\begin{array}{c} & 68 \\ & 75 \\ & 76 \\ & 92 \\ & 86 \\ & 86 \\ & 92 \\ & 100 $	103995
$^{77}_{93}$	55 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	992877370 9928788877370 9929999999999999999999999999999999999	
	$55\\95\\95\\88\\88\\88\\88\\88\\88\\88\\88\\88\\88\\88\\88\\88$	667 99 99 101 99 101 101 101 101 101 101 10	$\begin{array}{c} 71\\74\\85\\85\\85\\92\\96\\96\end{array}$
88 81 22 22 22 22 22 22 22 22 22 22 22 22 22	928883388888888888888888888888888888888	$\substack{662\\65681}{912}$	$\begin{array}{c} 68\\ 82\\ 82\\ 82\\ 82\\ 82\\ 82\\ 82\\ 82\\ 82\\ 8$
838725	$553\\885883388777471288652956\\88588838877747128885888838877747178885888888888888888888888888888$	$\begin{array}{c} 55\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\$	88823242888
8133862	8522425855555 85224255555555555 85225555555555	$\frac{55}{26}$	$\frac{66}{82}$
1122667	8.726555555555555555555555555555555555555	$\begin{array}{c} 555 \\ 556 \\ 669 \\ 669 \\ 669 \\ 660 \\ 818 \\$	82 27 26 E
64 66 71 71 71 72	76 65 65 75 55 57 74 73 68 50 74 74 74 74 74 74 74 74 74 74 74 74 74	88313188885888588	73 73 73 73 73 73 73 73 73 73 73 73 73 7
$\begin{array}{c} 59\\ 63\\ 68\\ 68\\ 68\\ 68\\ 70\\ 70\\ 70\\ 70\\ 70\\ 70\\ 70\\ 70\\ 70\\ 70$	$\begin{array}{c} 445 \\ 552 \\ 557 \\ 655 \\ 655 \\ 657 \\$	32723866555555	172065155 172065155 172065155
58 58 65 65 65 65 65 63	$\begin{array}{c} 443 \\ 555 \\$	32128669995155	19862288
65 8 8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	$\begin{array}{c} 41 \\ 41 \\ 55 \\$	42656888888888 2200568888888888 22005688888888888 2200568888888888888888888888888888888888	58855555555555555555555555555555555555
51 55 55 53 53 53 53 53 53 53 53 53 53 53	652600000000000000000000000000000000000	686655555555688 88665555555555555 886655555555	8:2822253558
58 52 50 58 58 57 59 58 50 58	$\begin{smallmatrix} & 3.3\\ & 3.7\\ & 5.5$	13335555555555555555555555555555555555	625525686
5149	$33.5\\5.5\\5.5\\5.5\\5.5\\5.5\\5.5\\5.5\\5.5\\5.5$		54442555555 5645555555 565555555 56555555 5655555 565555 565555 565555 565555 565555 565555 565555 565555 565555 565555 565555 565555 565555 565555 5655555 5655555 5655555 5655555 5655555 56555555
5149444 514944 514944 51495 51495 514555 514555 514555 5145555 51455555555	$\begin{array}{c} & & & & & & & & & & & & & & & & & & &$	$\begin{smallmatrix} & & & & & & & & & & & & & & & & & & &$	144446655 144446655 14446655 144665 144665 144665 146655 14665 14665 14665 14665 146655 146655 146655
$^{46}_{25}$	$\begin{array}{c} \textbf{32}\\ \textbf{32}\\ \textbf{32}\\ \textbf{33}\\ $	$\begin{array}{c} 336\\ 54\\ 55\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52\\ 52$	86444646464646666666666666666666666666
000 12 000 000 000 000 000 000 000 000 0	$\begin{smallmatrix} & & & & & & & & & & & & & & & & & & &$	222222222222222222222222222222222222	33.25 86 86 86 86 86 86 86 86 86 86 86 86 86
$350 \\ 370 $	$222\\232\\242\\242\\252\\252\\252\\252\\252\\252\\252\\25$	$\begin{smallmatrix} & & & & \\ & & & & \\ & & & & \\ & & & & $	85 88 85 88 85 85 85 85 85 85 85 85 85 8
3810 330 337 37 37 37 37 37 37 37 37 37 37 37 37	40882323280555555 40888232555555555555555555555555555555555	4240	44088533320 4108853320 41
35,233,231,29	333532 $320$ $232$ $2$	$^{+0.8}_{-0.8}$	88888888888888888888888888888888888888
3313888857 3313888857	3333335828288 <b>58</b> 88888888	88883339888888888888888888888888888888	3333333555 33533555
2222228	33888888888888888888888888888888888888	222828282828282	338238288
2222222	22222222222222222222222222222222222222	2382922222828288	828288888
358288	22222222222222222222222222222222222222	2222322201988112 2222322201988222	85888888
11 11 11 11 11 11 11 11 11 11 11 11 11	20001188811122 2001188811122 200118881122	41112111111111111111111111111111111111	22011877165
14 15 16	1112212414122210111	112 113 115 117 117 117 117 117 117 117 117 117	115 115 115 115 113 115 113 115 113 115 113 115 113 115 113 115 113 113
11212121	14 12 12 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1443332525111 <b>0</b> 0 1443332525111 <b>0</b> 0	811222884
88887 8888 8888	17 × 18 191. 191. 191. 191. 191. 191. 191. 19	18 × 19. 20. 21. 22. 22. 22. 23. 23. 23. 23. 24. 24. 25. 25. 25. 27. 27. 27. 27. 27. 27. 27. 27. 27. 27	19 x 20 21 22 23 26 26 27

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THE SCALING OF NATIONAL FOREST TIMBER.

		End dimen- sions.		Inches. 19 x 28 30	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	<b>21 × 22</b> 23 × 22 23 23 23 23 23 23 23 23 23 23 23 23 2	<b>22</b> x 23 24 25
				14 15 15	1222224	12 13 15 15 15 15 15 15 15 15 15 15 15 15 15	13 14
		5		18 19 19	$\begin{array}{c} 11\\15\\11\\17\\19\\19\\20\\20\\20\\20\\20\\20\\20\\20\\20\\20\\20\\20\\20\\$	2122021981175 2122021981775 2122021981775	17 18 18
		9		3337	222222222222222222222222222222222222	8522222225	2222
		1		2526	8222222228	282222232	2522
Ĩ		Ś		8888	888888888888	38238888888	2823
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LE 2		10			48888888888	29229888944	2022
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nrr		12		444	9999969999999 9999994444444	20002000000000000000000000000000000000	444
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105	of de		boar	12,22,22	242588888888	487888888k	7.98
AR	lect-	- 18	d fee	000 2555	171000000000000 80000000000 800000000000	1001300000000	000
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BEC	ڈی	20	tens	233	8:15:16:66:66:82	S22828666	1328
		21		8:15	8235022228 8235222222222222222222222222222222	282756	5755
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tin		- 23		875	8888833386	12572825882	22.2%
led.				2855	68258223333	100.5058.884 100.5058.884	222
		26		- ৪৯৯ 	6528888888919 9480480480	<u>x x x 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5</u>	56% 70%
		27			00000000000000000000000000000000000000	00113 00100 0113 01100 0113 01100 0113 01100 0113 01100 0113 01100 0113 01110 01110 0100000000	888
		- 28		889	12882888888888888888888888888888888888	86 94 95 95 96 10 90 10 10 10 10 10 10 10 10 10 10 10 10 10	2.88
		29		103 1107 1110	16 108 107 108 28 28 28 28 28 28 28 28 28 28 28 28 28	$\begin{smallmatrix} 89\\93\\100\\110\\111\\111\\112\\112\\112\\112\\112\\112$	$102 \\ 106 $
		30		106 110 114	888 100 100 100 100 100 100 100 100 100	$^{92}_{113}$	101 106 110
		31		110 114 118	87 91 95 95 95 95 95 107 112 112 112 112 112	128 128 108 108 108 108 108 108 108 108 108 10	105 109 114
		32	1	$113 \\ 118 \\ 122 $	$ 94 \\ 94 \\ 94 \\ 94 \\ 94 \\ 111 \\ 111 \\ 111 \\ 111 \\ 112 \\ 112 \\ 128 \\ $	$\begin{smallmatrix}&&9\\103\\112\\112\\121\\125\\132\\134\end{smallmatrix}$	$108 \\ 113 \\ 117 $

	ន	54.2	<b>25</b> .3	26.2	\$ 12	83	50 ×
28. 28. 30.	<b>r 24</b> 25 26 26 28 28 28 28 28 28 28 28 28	r 25 26 27 28 29 30	26 27 28 29 30	227 228 20	29 29	529 30	c 30
1209116	11165155 18877155 1888	10 10 10 10 10 10 10 10 10 10 10 10 10 1	11 19 19 20	2585	858	222	23
28228	23222228 2322228	2222222	222222	262233	$25 \\ 26 \\ 27 \\ 27 \\ 27 \\ 27 \\ 27 \\ 27 \\ 27$	27 28	29
82288	582882333 58555333	5857852 587852 58	3628238	33.83 §	30 31 32	32	3.5
38882	53382828 533828 538	$\frac{32}{2}$	35 33 33 33 35 33 33 33 35 45 33	33 35 35 35	35 38 38	38 29	41
8.53 33 33 8 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	33843323 36443323 378443323 3784433 378444 378443 378443 378443 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444 3784444444444	8349823355 8349883355	682388 88828 8982 8982 8982 8982 8982 898	37 39 42 42	64 <u>5</u> 4	43	46
403376 403376 403376	$33 \\ 41 \\ 41 \\ 33 \\ 33 \\ 33 \\ 33 \\ 33 \\ $	$^{33}_{42}$	$^{45}_{20}$	445 145 17 17	45 47 49	49 50	52
$^{38}_{60}$	232	444 865 865 865 865 865 865 865 865 865 865	45 44 50 50 50 50	44 50 52 52 52	55 54 54	54	58
444 444 75 84 84 84 84 84 84 84 84 84 84 84 84 84	$^{46}_{24}$	$^{46}_{53}$	55 55 55 55	52552	55	60	64
494 194 194 194 194 194 194 194 194 194	555555444 5555555555555555555555555555	$566 \pm 522$	55 56 58 58 58 58 58 58 58 58 58 58 58 58 58	56 58 60 62 62 62 62 62 62 62 62 62 62 62 62 62	65 69	65 67	22
52 23 21 20	84555556850 8605548850 860555558	556 556 556 556 556 556 556 556 556 556	56 61 63 63 63	61 63 65 65 63	68 89 70	73	75
562223	575889975 575889975	55 65 65 65 65 65 60 85 60 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 80 85 85 85 85 85 85 85 85 85 85 85 85 85	2855.85 2020	32088	3331	76	81
57 66 64 65 65 65 65 65 65 65 65 65 65 65 65 65	6646668888 6646668888	72 72 65 66 65 66 65 66 65 66 65 66 66 66 66	322885	25523	$^{76}_{81}$	85 12 12	87
28885	59 66 66 69 69 69 69 72 72 69 69 72 72 72 72 72 72 72 72 72 72 72 72 72	64 67 77 72 72 72 72 72 72 72 72 72 72 72 72	843358	88.88	85 S2 S2	52 50	93
72 22 22 22 22 22 22 22 22 22 22 22 22 2	288522988 28892 2892 2892 2892 2892 2892	\$2333328	22223	8828	88 8 G	92	96]
224426	882121266	S158228	8.2.2.2.8	2288	1666	101 10	104 1
82122 82128 8218 85	222222232	012882329 012882329 012882329 012882329 012882329 012882329 012882329 012882329 012882329 012882329 012882329 0128825329 0128853529 012885555 0128855555 0128855555 012885555555 0128855555555555555555555555555555555555	82888 828888 828888	88 86 10 10 10 10	03 10 03 10	03 11	10 11
0000000 000000	272888930	<u>8886888</u>	002200 002000	1010	8110	2 H 2	6 12
୦୦୦୦୦୦ କ୍ରୁଭୁରୁଷ	00000000000000000000000000000000000000	8292920 2029920	0.00000	1100 1000 1000 1000	3116	4 11 8 12	2 12
47047 82992	883322555 101222288		011000	1110	915C	315 315	8 133
236 201	83666 <u>6</u> 67	<u></u>	1100	12312	130	136	135
986029 10086		1100	12212	120	1126	135	145
99 101 102 103 103	1108	122108	1111	122	131 136 140	141	151
<u>861131</u>	90 110 120 120 120 120 120 120 120 120 12	112 122 122 122 122 122 122 122 122 122	1122 12	131	136 141 146	146	157
1110	12511112	$\frac{116}{125}$	$121 \\ 126 \\ 131 \\ 135 \\ 135 \\ 136 $	131 136 141 141 141	116 116 151	$152 \\ 157$	162
$115 \\ 119 \\ 123 \\ 128 $	107 116 125 125 133 133	116 125 125 139 139	145 146 145 145	136 141 146 146	$151 \\ 151 \\ 157 $	$157 \\ 162$	168
$114 \\ 123 \\ 128 \\ 128 \\ 132 $	1150 1150 1150 1150 1150 1150 1150 1150	$120 \\ 125 \\ 134 \\ 139 \\ 139 \\ 139 \\ 139 \\ 144 \\ 139 \\ 125 $	$130 \\ 145 \\ 145 \\ 150 \\ 150 \\ 150 \\ 150 \\ 150 \\ 150 \\ 120 $	$140 \\ 151 \\ 151 \\ 156 $	151 157 162	$162 \\ 168$	174
$118 \\ 127 \\ 132 \\ 132 \\ 136 \\ 136 $	$\begin{array}{c} 114 \\ 119 \\ 124 \\ 128 \\ 133 \\ 133 \\ 138 \\ 138 \\ 143 \\ 143 \end{array}$	$124 \\ 139 \\ 139 \\ 140 \\ 140 $	134 145 155 155	145 150 156 161	$156 \\ 162 \\ 167 $	168 174	180
122 131 131 136 141	$1128 \\ $	$128 \\ 133 \\ 143 \\ 148 \\ 148 \\ 154 \\ 154 \\ 154 \\ 128 $	139 144 155 160	150 155 161	$161 \\ 167 \\ 173 $	$173 \\ 179$	186

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# TABLE 3.-CULL FOR SQUARED DEFECTS.

# [20 per cent deducted for kerf from solid board foot contents.]

					Le	ngth	l of d	efect	t—fee	ət.				
End dimensions.	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ĺ					Cont	ents	bo	ard f	eet i	n ter	ıs.			
Inches.					1		0.5	0.5	0 =	0.5	0.5	0.5	0.5	0.5
3x3 4x4 5x5 6x6	0.5 .5 1	0.5 .5 1 1	0.5 .5 1 1	$     \begin{array}{c}       0.5 \\       1 \\       1 \\       2     \end{array}   $	$\stackrel{0.5}{\stackrel{1}{\scriptstyle 1}}$	$0.5 \\ 1 \\ 2 \\ 2$		0.5 .5 1 2 3		$     \begin{array}{c}       0.5 \\       1 \\       2 \\       3     \end{array}   $	1 1 2 3	$     \begin{array}{c}       0.5 \\       1 \\       2 \\       2 \\       4     \end{array} $	0.5 1 2 3 4	$     \begin{array}{c}       0.5 \\       1 \\       2 \\       3 \\       4     \end{array} $
7x7. 8x8. 9x9. 10x10. 11x11.	$     \begin{array}{c}       1 \\       2 \\       2 \\       3 \\       3     \end{array}   $	2 2 3 4	2 3 4 5	$     \begin{array}{c}       2 \\       3 \\       4 \\       5 \\       6     \end{array} $	$3 \\ 3 \\ 4 \\ 5 \\ 6$	$\frac{3}{4}$ $\frac{5}{6}$ $\frac{7}{7}$	34-57-8	4 5 6 7 9	4 5 8 10	$     \begin{array}{c}       4 \\       6 \\       7 \\       9 \\       10     \end{array} $	$5 \\ 6 \\ 8 \\ 9 \\ 11$	5 6 8 10 12	5 7 9 11 13	$     \begin{array}{c}       6 \\       7 \\       9 \\       11 \\       14 \\       14     \end{array} $
12x12 13x13 14x14 15x15 16x16	4 5 6 7	5 6 7 8 9		7 9 10 12	8 9 10 12 14	9 10 12 14 15	10 11 13 15 17	11 12 14 16 19	$12 \\ 14 \\ 16 \\ 18 \\ 20$	$12 \\ 15 \\ 17 \\ 20 \\ 22$	$     \begin{array}{c}       13 \\       16 \\       18 \\       21 \\       24     \end{array} $	$     \begin{array}{r}       14 \\       17 \\       20 \\       22 \\       26     \end{array} $	15 18 21 24 27	$     \begin{array}{r}       16 \\       19 \\       22 \\       26 \\       29     \end{array} $
17x17. 18x18. 19x19. 20x20. 21x21.	8 9 10 11 12	10 11 12 13 15	$12 \\ 13 \\ 14 \\ 16 \\ 18$	13 15 17 19 21	15 17 19 21 24	$     \begin{array}{r}       17 \\       19 \\       22 \\       24 \\       26     \end{array} $	19 22 24 27 29	21 24 26 29 32	23 26 29 32 35	$25 \\ 28 \\ 31 \\ 35 \\ 38$	$27 \\ 30 \\ 34 \\ 37 \\ 41$	$29 \\ 32 \\ 36 \\ 40 \\ 44$	31 35 39 43 47	33 37 41 45 50
22x22 23x23 24x24 25x25 26x26	$     \begin{array}{c}       13 \\       14 \\       15 \\       17 \\       18     \end{array} $	16 18 19 21 23	$19 \\ 21 \\ 23 \\ 25 \\ 27$	23 25 27 29 32	$26 \\ 28 \\ 31 \\ 33 \\ 36$	29 32 35 38 41	$32 \\ 35 \\ 38 \\ 42 \\ 45$	$35 \\ 39 \\ 42 \\ 46 \\ 50$	$39 \\ 42 \\ 46 \\ 50 \\ 54$	42 46 50 54 59	45 49 54 58 63	48 53 58 63 68	52 56 61 67 72	55 60 65 71 77 83
27x27. 28x28. 29x29. 30x30.	19 21 22 24	$     \begin{array}{c}       24 \\       26 \\       28 \\       30     \end{array} $	$29 \\ 31 \\ 34 \\ 36$	34 37 39 42	39 42 45 48	44 47 50 54	49 52 56 50	$53 \\ 57 \\ 62 \\ 66$	58 63 67 72	63 68 73 78	68 73 78 84	73 78 84 90	78 84 90 96	89 95 102

# TABLE 3.-CULL FOR SQUARED DEFECTS-Continued.

					$\mathbf{Le}$	ngth	of def	ect—f	eet.						
End dimen- sions.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
					Conte	ents—	board	l feet	in ten	s.					
Inches.			• .												}
2x2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1
3x3	1	1	1	1	1	1	1	$^{2}$	2	2	2	2	2	2	$\frac{2}{2}$
4x4	• 2	2	2	2	2	$^{2}$	3	3	3	3	3	3	3	3	- 3
5x5	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5
6x6	4	5	5	5	5	6	6	6	6	6	7	7	7	7	8
7x7	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10
8x8	Ň.	8	9	9	ġ	10	10	11	11	12	12	12	13	13	14
9x9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17
10x10	12	13	13	14	$1\widetilde{15}$	15	16	17	17	18	19	19	120	21	21
11x11	15	15	16	17	18	19	19	20	21	22	23	23	24	25	26
1010	17	10	10	20	91	99	62	94	95	96	97	100	20	20	21
12.12	20	10	19	- 20	21	22	20	24	20	20	20	20	20	25	26
10110	20	21	23	24	20	20	21	20	29	25	32	20	30	41	42
19X19	24	20	20	20	29	24	26	20	20	10	191	- 00	45	46	42
16x16	31	$\frac{20}{32}$	34	36	38	39	41	43	44	46	48	49	51	53	55
17x17	35	37	39	40	42	44	46	48	50	52	54	56	58	60	62
18x18	39	41	43	45	48	50	52	54	56	58	60	63	65	67	69
19x19	43	46	48	51	53	55	58	60	63	65	67	70	72	70	111
20x20	48	51	53	56	59	61	64	67	69	72	10	11	80	83	85
21x21	53	56	59	62	65	68	71	74	76	79	82	85	88	91	94
22 <b>x</b> 22	58	61	65	68	71	74	77	81	84	87	90	94	97	100	103
23x23	63	67	71	74	78	81	85	88	92	95	99	102	106	109	113
24x24	69	73	77	81	84	88	92	96	100	104	108	111	115	119	123
25x25	75	79	83	88	92	96	100	104	108	112	117	121	125	129	133
26x26	81	86	90	95	99	104	108	113	117	122	126	131	135	140	144
97 <b>x</b> 97	87	92	97	102	107	119	117	199	126	131	136	141	146	151	156
21141	01	00	105	110	115	120	195	121	120	141	146	159	157	162	167
20420	101	107	119	110	192	120	125	110	1.16	151	157	162	169	173	170
20x29	102	114	120	196	120	129	144	150	156	169	169	174	180	186	102
30A30	100	114	120	120	102	199	1.4.4	190	100	102	103	114	100	100	194
		1	1	1	1						1				

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# 58

	Average middle diameter (in inches).																	
ų.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Lengt				-			Co	onten	its (i	n cu	bic f	eet).						
<i>Feet</i> . 4 5	0.25 .25	0. 25 . 5	$0.5 \\ .5$	1 1	1 1	$\frac{1}{2}$	$\frac{2}{2}$	$^{2}_{3}$	3 3	3 4	45	4 5	5 6	$\frac{6}{7}$	$^{6}_{8}$	7 9	8 10	9 11
	. 25 . 25 . 5 . 5 . 5 . 5	$     \begin{array}{c}       .5 \\       .5 \\       .5 \\       1 \\       1   \end{array} $	$     \begin{array}{c}       1 \\       1 \\       1 \\       1 \\       1 \\       1     \end{array} $	$\begin{array}{c}1\\1\\2\\2\\2\end{array}$	$2 \\ 2 \\ 2 \\ 2 \\ 3 \\ 3$	$\frac{2}{3}$	33444	3     4     4     5     5	4 5 6 7	5 5 6 7 8	6 6 7 8 9	$     \begin{array}{c}       6 \\       7 \\       9 \\       10 \\       11     \end{array}   $	$     \begin{array}{r}       7 \\       9 \\       10 \\       11 \\       12     \end{array} $	8 10 11 13 14	$9 \\ 11 \\ 13 \\ 14 \\ 16$	$11 \\ 12 \\ 14 \\ 16 \\ 18$	$12 \\ 14 \\ 16 \\ 18 \\ 20$	$13 \\ 15 \\ 17 \\ 20 \\ 22$
$11 \\ 12 \\ 13 \\ 14 \\ 15$		$     \begin{array}{c}       1 \\       1 \\       1 \\       1 \\       1 \\       1     \end{array} $		$\begin{array}{c} 2\\ 2\\ 3\\ 3\\ 3\\ 3\end{array}$	3 3 4 4	445555	5566 67	$\begin{array}{c} 6\\7\\7\\8\\8\end{array}$	$7 \\ 8 \\ 9 \\ 9 \\ 10$	9 9 10 11 12	$     \begin{array}{r}       10 \\       11 \\       12 \\       13 \\       14     \end{array} $	$12 \\ 13 \\ 14 \\ 15 \\ 16$	13 15 16 17 18	15 17 18 20 21	$17 \\ 19 \\ 20 \\ 22 \\ 24 \\ 24 \\ 17 \\ 19 \\ 19 \\ 19 \\ 19 \\ 19 \\ 19 \\ 19$	$     \begin{array}{r}       19 \\       21 \\       23 \\       25 \\       27     \end{array} $	$22 \\ 24 \\ 26 \\ 28 \\ 30$	$24 \\ 26 \\ 28 \\ 31 \\ 33$
$     \begin{array}{c}       16 \\       17 \\       18 \\       19 \\       20     \end{array} $	1 1 1 1	$     \begin{array}{c}       1 \\       1 \\       2 \\       2 \\       2     \end{array} $	$2 \\ 2 \\ 2 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ $	33444	4 5 5 5 5 5	6 6 6 7	1-8889	9 9 10 10 11	11 11 12 13 13	$     \begin{array}{r}       13 \\       13 \\       14 \\       15 \\       16     \end{array} $	15 16 17 18 18	17 18 19 20 21	$20 \\ 21 \\ 22 \\ 23 \\ 25$	22 24 25 27 28	$25 \\ 27 \\ 28 \\ 30 \\ 32$	$28 \\ 30 \\ 32 \\ 34 \\ 35$	32 33 35 37 39	$35 \\ 37 \\ 39 \\ 41 \\ 44$
$21 \\ 22 \\ 23 \\ 24 \\ 25$	1 1 1 1 1	$     \begin{array}{c}       2 \\       2 \\       2 \\       2 \\       2     \end{array} $	30 20 20 20		6 6 6 6 7	1-8889	9 10 10 11 11	$11 \\ 12 \\ 13 \\ 13 \\ 14$	$14 \\ 15 \\ 15 \\ 16 \\ 16 \\ 16$	$     \begin{array}{c}       16 \\       17 \\       18 \\       19 \\       20 \\     \end{array} $	19 20 21 22 23	22 24 25 26 27	$26 \\ 27 \\ 28 \\ 29 \\ 31$	29 31 32 34 35	33 35 36 38 39	$37 \\ 39 \\ 41 \\ 42 \\ 44$	41 43 45 47 49	$     \begin{array}{r}       46 \\       48 \\       50 \\       52 \\       55 \\       55 \\       \end{array} $
26 27 28 29 30			  	5 5 5 6 6	1-1-1-9.8	$9 \\ 9 \\ 10 \\ 10 \\ 10 \\ 10$	11 12 12 13 13	$     \begin{array}{r}       14 \\       15 \\       15 \\       16 \\       16 \\       16     \end{array} $	$     \begin{array}{c}       17 \\       18 \\       19 \\       20     \end{array} $	$     \begin{array}{c}       20 \\       21 \\       22 \\       23 \\       24 \\     \end{array} $	$     \begin{array}{c}       24 \\       25 \\       26 \\       27 \\       28     \end{array} $	28 29 30 31 32	32 33 34 36 37	36 38 39 40 42	$ \begin{array}{c} 41 \\ 43 \\ 44 \\ 46 \\ 47 \\ \end{array} $	46 48 49 51 53	51 53 55 57 59	$57 \\ 59 \\ 61 \\ 63 \\ 65$
31 32 33 34 35	····	· · · · ·	-	6 6 7 7	8000 999 9	$11 \\ 11 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\$	$14 \\ 14 \\ 15 \\ 15 \\ 15 \\ 15 \\ 15 \\ 15 \\ $	$     \begin{array}{c}       17 \\       17 \\       18 \\       19 \\       10 \\$	$20 \\ 21 \\ 22 \\ 22 \\ 23 \\ 23 \\ 23 \\ 20 \\ 21 \\ 23 \\ 23 \\ 21 \\ 20 \\ 21 \\ 21 \\ 22 \\ 23 \\ 23 \\ 23 \\ 21 \\ 21$	24 27 26 27 27	$     \begin{array}{c}       29 \\       5 \\       29 \\       5 \\       30 \\       7 \\       31 \\       7 \\       32 \\     \end{array} $	33 34 35 36 37	$     \begin{array}{c}       38 \\       39 \\       40 \\       42 \\       43     \end{array} $	$43 \\ 45 \\ 46 \\ 47 \\ 49 \\ 49 \\ 49 \\ 49 \\ 49 \\ 49 \\ 49$	$     \begin{array}{c}       49 \\       50 \\       52 \\       54 \\       55 \\     \end{array} $	55 57 58 60 62	61 63 65 67 69	$     \begin{array}{r}       68 \\       70 \\       72 \\       74 \\       76 \\     \end{array} $
36 37 38 39 40		· · · · · · · · · · · · · · · · · · ·		77778	10 10 10 10 11	13 13 13 14 14 14	$16\\16\\17\\17\\17\\18$	$20 \\ 20 \\ 21 \\ 21 \\ 21 \\ 22 \\ 22 \\ 22 \\ $	$     \begin{array}{c}       24 \\       24 \\       25 \\       26 \\       26     \end{array} $	29 29 30 31	$\begin{array}{cccc} 3 & 33 \\ 0 & 34 \\ 0 & 35 \\ 1 & 36 \\ 1 & 37 \\ 1 & 37 \end{array}$	$38 \\ 40 \\ 41 \\ 42 \\ 43 $	$     \begin{array}{ccc}             3 & 44 \\             45 & 45 \\             47 & 47 \\             48 & 49 \\             49 & 49 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\             41 & 40 \\          $	50 52 53 54 56		$     \begin{array}{r}       64 \\       65 \\       67 \\       69 \\       71 \\     \end{array} $	71 73 75 77 79	79 81 83 85 85

# TABLE 4.-SOLID CUBIC CONTENTS OF LOGS.

# TABLE 4.—SOLID CUBIC CONTENTS OF LOGS—Continued.

	Average middle diameter (in inches).																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Length				,			1	(	ont	ent	s (iı	ı cub	oic fe	et).						
Ft. 4 5	$10 \\ 12$	11 13	12 14	$\begin{array}{c} 13\\ 16\end{array}$	14 17	15 18	16     20	17 21	18 23	$\frac{20}{25}$	21 26	$\frac{22}{28}$	$\frac{24}{30}$	$25 \\ 32$	$27 \\ 33$	28 35	$\frac{30}{37}$	$\frac{32}{39}$	$33 \\ 41$	35 44
6 7 8 9 10	$     \begin{array}{r}       14 \\       17 \\       19 \\       22 \\       24 \\     \end{array} $	$     \begin{array}{r}       16 \\       18 \\       21 \\       24 \\       26     \end{array} $	$17 \\ 20 \\ 23 \\ 26 \\ 29$	$19 \\ 22 \\ 25 \\ 28 \\ 31$	20 24 27 31 34	22 26 29 33 37	$24 \\ 28 \\ 32 \\ 36 \\ 40$	$26 \\ 30 \\ 34 \\ 38 \\ 43$	$28 \\ 32 \\ 37 \\ 41 \\ 46$	29 34 39 44 49	$31 \\ 37 \\ 42 \\ 47 \\ 52$	$34 \\ 39 \\ 45 \\ 50 \\ 56$	$36 \\ 42 \\ 48 \\ 53 \\ 59$	38 44 50 57 63	$40 \\ 47 \\ 53 \\ 60 \\ 67$	$42 \\ 49 \\ 57 \\ 64 \\ 71$	$45 \\ 52 \\ 60 \\ 67 \\ 75$	47 55 63 71 79	50 58 66 75 83	$52 \\ 61 \\ 70 \\ 79 \\ 87$
$11 \\ 12 \\ 13 \\ 14 \\ 15$	26 29 31 34 36	29 32 34 37 40	$32 \\ 35 \\ 38 \\ 40 \\ 43$	$35 \\ 38 \\ 41 \\ 44 \\ 47$	$37 \\ 41 \\ 44 \\ 48 \\ 51$	$41 \\ 44 \\ 48 \\ 52 \\ 55$	$44 \\ 48 \\ 52 \\ 56 \\ 60$	$47 \\ 51 \\ 56 \\ 60 \\ 64$	$50 \\ 55 \\ 60 \\ 64 \\ 69$	$54 \\ 59 \\ 64 \\ 69 \\ 74$	58 63 68 73 79	$61 \\ 67 \\ 73 \\ 78 \\ 84$	65 71 77 83 89	69 76 82 88 95	73 80 87 94 100	78 85 92 99 106	82 90 97 105 112	87 95 102 110 118	$91 \\ 100 \\ 108 \\ 116 \\ 124$	96 105 113 122 131
16 17 18 19 20	$     \begin{array}{r}       38 \\       41 \\       43 \\       46 \\       48 \\     \end{array} $	42 45 48 50 53	$46 \\ 49 \\ 52 \\ 55 \\ 58 \\ 58 \\ 100 $	50 53 57 60 63	$55 \\ 58 \\ 61 \\ 65 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68$	59 63 66 70 74	64 68 72 76 80	68 73 77 81 86	73 78 83 87 92	79 83 88 93 98	$84 \\ 89 \\ 94 \\ 100 \\ 105$	89 95 101 106 112	$95 \\ 101 \\ 107 \\ 113 \\ 119$	$101 \\ 107 \\ 113 \\ 120 \\ 126$	$107 \\ 114 \\ 120 \\ 127 \\ 134$	$113 \\ 120 \\ 127 \\ 134 \\ 141$	$\begin{array}{c} 119 \\ 127 \\ 134 \\ 142 \\ 149 \end{array}$	$126 \\ 134 \\ 142 \\ 150 \\ 158 $	$133 \\ 141 \\ 149 \\ 158 \\ 166$	140 148 157 166 175
$21 \\ 22 \\ 23 \\ 24 \\ 25$	$51 \\ 53 \\ 55 \\ 58 \\ 60$	$55 \\ 58 \\ 61 \\ 63 \\ 66$	$     \begin{array}{c}       61 \\       63 \\       66 \\       69 \\       72     \end{array} $	66 69 72 75 79	72 75 78 82 85	77 81 85 88 92	83 87 91 95 99	90 94 98 103 107	$96 \\ 101 \\ 105 \\ 110 \\ 115 \\$	103 108 113 118 123	$110 \\ 115 \\ 121 \\ 126 \\ 131$	117 123 128 134 140	125 131 137 143 148	$132 \\ 139 \\ 145 \\ 151 \\ 158 $	$140 \\ 147 \\ 154 \\ 160 \\ 167$	$148 \\ 156 \\ 163 \\ 170 \\ 177$	$157 \\ 164 \\ 172 \\ 179 \\ 187$	165 173 181 189 197	174 183 191 199 207	183 192 201 209 218
$26 \\ 27 \\ 28 \\ 29 \\ 30$	63 65 67 70 72	$69 \\ 71 \\ 74 \\ 77 \\ 79 \\ 79$	75 78 81 84 87	82 85 88 91 94	89 92 95 99 102	96 100 103 107 111	$     \begin{array}{r}       103 \\       107 \\       111 \\       115 \\       119 \\     \end{array} $	$111 \\ 115 \\ 120 \\ 124 \\ 128$	119 124 128 133 138	$128 \\ 133 \\ 137 \\ 142 \\ 147 \\ 147 \\ 147 \\ 147 \\ 147 \\ 147 \\ 147 \\ 148 \\ 147 \\ 148 $	$136 \\ 142 \\ 147 \\ 152 \\ 157 $	$145 \\ 151 \\ 156 \\ 162 \\ 168 $	154 160 166 172 178	164 170 177 183 189	$174 \\ 180 \\ 187 \\ 194 \\ 200$	184 191 198 205 212	194 202 209 217 224	205 213 221 228 236	216 224 232 241 249	$227 \\ 236 \\ 244 \\ 253 \\ 262$
31 32 33 34 35	75 77 79 82 84	82 84 87 90 92	89 92 95 98 101	97 101 104 107 110	$106 \\ 109 \\ 112 \\ 116 \\ 119$	$114 \\ 118 \\ 122 \\ 125 \\ 129 \\$	$123 \\ 127 \\ 131 \\ 135 \\ 139$	$133 \\ 137 \\ 141 \\ 145 \\ 150 \\ 150 \\ 120 $	$142 \\ 147 \\ 151 \\ 156 \\ 161$	$152 \\ 157 \\ 162 \\ 167 \\ 172 $	162 168 173 178 183	173 179 184 190 195	184 190 196 202 208	195 202 208 214 221	207 214 220 227 234	219 226 233 240 247	231 239 246 254 261	$244 \\ 252 \\ 260 \\ 268 \\ 276$	$257 \\ 265 \\ 274 \\ 282 \\ 290 \\$	271 279 288 297 305
36 37 38 39 40	87 89 91 94 96	95 98 100 103	104 107 110 113 113 115	$     \begin{array}{r}       113 \\       116 \\       119 \\       123 \\       126 \\     \end{array} $	$123 \\ 126 \\ 130 \\ 133 \\ 136$	$133 \\ 136 \\ 140 \\ 144 \\ 147$	$143 \\ 147 \\ 151 \\ 155 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 159 \\ 150 $	154 158 162 167 171	$165 \\ 170 \\ 174 \\ 179 \\ 183$	$177 \\ 182 \\ 187 \\ 191 \\ 196 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	189 194 199 204 210	201 207 212 218 223	214 220 226 232 238	$227 \\ 233 \\ 240 \\ 246 \\ 252$	$241 \\ 247 \\ 254 \\ 261 \\ 267$	254 262 269 276 283	269 276 284 291 299	284 291 299 307 315	299 307 315 324 332	$314 \\ 323 \\ 332 \\ 340 \\ 349$

# **6**0

# THE SCALING OF NATIONAL FOREST TIMBER.

# TABLE 4.-SOLID CUBIC CONTENTS OF LOGS-Continued.

	Average middle diameter (in inches).																			
'n.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Lengt				,				(	Con	ten	ts (i	n cul	oic fe	et).						
Ft. 4 5	37 46	38 48	40 50	42 53	44 55	$\frac{46}{58}$	48 60	50 63	52 65	55 68	57 71	59 74	61 77	64 80	66 82	68 86	71 89	73 92	76 95	79 98
6 7 8 9 10	55 64 73 83 92	58 67 77 87 93	61 71 81 91 101	$63 \\ 74 \\ 84 \\ 95 \\ 106$	66 77 88 99 110	69 81 92 104 115	$72 \\ 84 \\ 96 \\ 108 \\ 120$	75 88 101 113 126	79 92 105 118 131	82 95 109 123 136	85 99 113 128 142	88 103 118 133 147	92 107 123 138 153	$95 \\ 111 \\ 127 \\ 143 \\ 159$	$99\\115\\132\\148\\105$	$103 \\ 120 \\ 137 \\ 154 \\ 171$	106 124 142 159 177	110 128 147 165 183	114 133 152 171 190	118 137 157 177 196
11 12 13 14 15	$101 \\ 110 \\ 119 \\ 128 \\ 138$	$106 \\ 115 \\ 125 \\ 135 \\ 144$	$111 \\ 121 \\ 131 \\ 141 \\ 151$	$     \begin{array}{r}       116 \\       127 \\       137 \\       148 \\       158 \\     \end{array} $	$121 \\ 133 \\ 144 \\ 155 \\ 166$	127 138 150 162 173	133 145 157 169 181	$138 \\ 151 \\ 163 \\ 176 \\ 188 $	144 157 170 183 196	$150 \\ 164 \\ 177 \\ 191 \\ 205$	156 170 184 199 213	$162 \\ 177 \\ 192 \\ 206 \\ 221$	169 184 199 214 230	175 191 207 223 239	$181 \\ 198 \\ 214 \\ 231 \\ 247$	$188 \\ 205 \\ 222 \\ 239 \\ 257$	$195 \\ 213 \\ 230 \\ 248 \\ 266$	202 220 239 257 275	209 228 247 266 285	216 236 255 275 295
16 17 18 19 20	$147 \\ 156 \\ 165 \\ 174 \\ 183$	$154 \\ 164 \\ 173 \\ 183 \\ 192$	161 171 182 192 202	169 180 190 201 211	177 188 199 210 221	185 196 208 219 231	193 205 217 229 241	$201 \\ 214 \\ 226 \\ 239 \\ 251$	$210 \\ 223 \\ 236 \\ 249 \\ 262$	218 232 245 259 273	$227 \\ 241 \\ 255 \\ 270 \\ 284$	$236 \\ 251 \\ 265 \\ 280 \\ 295$	$245 \\ 260 \\ 276 \\ 291 \\ 306$	$254 \\ 270 \\ 286 \\ 302 \\ 318$	$264 \\ 280 \\ 297 \\ 313 \\ 330$	$274 \\ 291 \\ 308 \\ 325 \\ 342$	284 301 319 337 354	$294 \\ 312 \\ 330 \\ 349 \\ 367$	304 323 342 361 380	314 334 353 373 393
$21 \\ 22 \\ 23 \\ 24 \\ 25$	193 202 211 220 229	$202 \\ 212 \\ 221 \\ 231 \\ 241$	$212 \\ 222 \\ 232 \\ 242 \\ 252 $	$222 \\ 232 \\ 243 \\ 253 \\ 264$	$232 \\ 243 \\ 254 \\ 265 \\ 276$	242 254 265 277 289	253 265 277 289 301	264 276 289 302 314	275 288 301 314 327	286 300 314 327 341	$298 \\ 312 \\ 326 \\ 340 \\ 355$	310 324 339 354 369	322 337 352 368 383	334 350 366 382 398	346 363 379 396 412	359 376 393 411 428	$372 \\ 390 \\ 408 \\ 425 \\ 443$	$385 \\ 404 \\ 422 \\ 440 \\ 459$	399 418 437 456 475	$412 \\ 432 \\ 452 \\ 471 \\ 491$
26 27 28 29 30	$238 \\ 248 \\ 257 \\ 266 \\ 275$	250 260 269 279 289	262 272 282 292 303	$275 \\ 285 \\ 296 \\ 306 \\ 317$	287 298 309 320 331	$300 \\ 312 \\ 323 \\ 335 \\ 346$	313 325 337 349 361	$327 \\ 339 \\ 352 \\ 364 \\ 377 \\$	340 354 367 380 393	$355 \\ 368 \\ 382 \\ 395 \\ 409 \\$	369 383 397 411 426	383 398 413 428 442	$398 \\ 414 \\ 429 \\ 444 \\ 460$	$\begin{array}{r} 414 \\ 429 \\ 445 \\ 461 \\ 477 \end{array}$	$\begin{array}{r} 429 \\ 445 \\ 462 \\ 478 \\ 495 \end{array}$	445 462 479 496 513	$461 \\ 478 \\ 496 \\ 514 \\ 532$	$477 \\ 495 \\ 514 \\ 532 \\ 550$	494 513 532 551 570	511 530 550 569 589
31 32 33 34 35	284 293 303 312 321	298 308 317 327 337	313 323 333 343 353	327 338 348 359 370	$342 \\ 353 \\ 364 \\ 376 \\ 387$	358 369 381 392 404	$373 \\ 386 \\ 398 \\ 410 \\ 422$	$390 \\ 402 \\ 415 \\ 427 \\ 440 \\ 440 \\ 100 $	406 419 432 445 458	423 436 450 464 477	$440 \\ 454 \\ 468 \\ 482 \\ 497 $	$457 \\ 472 \\ 487 \\ 501 \\ 516$	$475 \\ 490 \\ 506 \\ 521 \\ 536$	493 509 525 541 557	$511 \\ 528 \\ 544 \\ 561 \\ 577$	530 547 564 582 599	$549 \\ 567 \\ 585 \\ 603 \\ 620$	$569 \\ 587 \\ 605 \\ 624 \\ 642$	$589 \\ 608 \\ 627 \\ 646 \\ 665$	609 628 648 668 687
36 37 38 39 40	330 339 348 358 367	$346 \\ 356 \\ 366 \\ 375 \\ 385$	363 373 383 393 403	$380 \\ 391 \\ 401 \\ 412 \\ 422$	398 409 420 431 442	$415 \\ 427 \\ 439 \\ 450 \\ 462$	$     \begin{array}{r}       434 \\       446 \\       458 \\       470 \\       482 \\     \end{array} $	452 465 478 490 503	$\begin{array}{r} 471 \\ 485 \\ 498 \\ 511 \\ 524 \end{array}$	491 505 518 532 545	511 525 539 553 567	531 546 560 575 590	552 567 582 598 613	573 588 604 620 636	594 610 627 643 660	$     \begin{array}{r}       616 \\       633 \\       650 \\       667 \\       684     \end{array} $	638 656 673 691 709	661 679 697 716 734	683 702 721 740 759	707 726 746 766 766 785

# TABLE 5.-BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER!

	Length of timber—feet.													
End di- men- sions.	10	12	14	16	18	20	22	24						
				Contents	board	feet.								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 1_{\frac{3}{2}} \\ 1_{2} \\ 2_{3} \\ 1_{4} \\ 1_{5} \\ 5_{\frac{3}{2}} \\ 8_{\frac{3}{2}} \\ 1_{1} \\ 1_{3} \\ 1_{5} \\ 1_{2}$	$\begin{array}{c} 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 10 \\ 12 \\ 16 \\ 18 \\ 20 \\ 5 \\ 712 \\ 10 \\ 12 \\ 15 \\ 6 \\ 9 \\ 12 \\ 15 \\ 15 \\ 6 \\ 9 \\ 12 \\ 15 \\ 16 \\ 204 \\ 28 \\ 300 \\ 354 \\ 40 \\ 12 \\ 18 \\ 306 \\ 42 \\ 40 \\ 42 \\ 40 \\ 56 \end{array}$	$\begin{array}{c} 2_{\frac{1}{3}}, \\ 3_{\frac{1}{3}}, \\ 3_{\frac{1}{3}}, \\ 8_{\frac{1}{3}}, \\ 9_{\frac{1}{3}}, \\ 9_{\frac{1}{3}}, \\ 8_{\frac{1}{3}}, \\ 9_{\frac{1}{3}}, \\ 11_{\frac{1}{3}}, \\$	$\begin{array}{c} 2_1^2 \\ 4 \\ 5 \\ 6_2^2 \\ 8 \\ 9_2^2 \\ 8 \\ 9_2^2 \\ 8 \\ 9_2^2 \\ 8 \\ 9_2^2 \\ 8 \\ 9_2^2 \\ 8 \\ 103_2^2 \\ 10 \\ 103_2^2 \\ 10 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 101_3^2 \\ 100 \\ 1$	$\begin{matrix} 3 & 4\frac{1}{2} \\ 6 & 7\frac{1}{2} \\ 9 & 10\frac{1}{2} \\ 15 & 18 \\ 24 \\ 27 & 30 \\ 7\frac{1}{2} \\ 15 \\ 18 \\ 22\frac{1}{2} \\ 9 \\ 13\frac{1}{2} \\ 18 \\ 227 \\ 9 \\ 12 \\ 18 \\ 227 \\ 9 \\ 12 \\ 18 \\ 227 \\ 9 \\ 12 \\ 18 \\ 227 \\ 9 \\ 12 \\ 18 \\ 225 \\ 6 \\ 18 \\ 27 \\ 6 \\ 18 \\ 27 \\ 6 \\ 18 \\ 27 \\ 48 \\ 63 \\ 72 \\ 48 \\ 60 \\ 72 \\ 84 \\ 0 \\ 72 \\ 84 \end{matrix}$	$3\frac{1}{4}$ $5\frac{67}{8}$ $8\frac{1}{4}$ $10\frac{1}{1}\frac{1}\frac$	$3\frac{2}{5}$ $57\frac{1}{5}$ $9\frac{1}{5}$ $112\frac{2}{5}$ $229\frac{1}{5}$ $22\frac{2}{5}\frac{1}{5}$ $336\frac{2}{5}\frac{1}{5}\frac{1}{5}$ $227\frac{1}{5}$ $116\frac{1}{5}22$ $27\frac{1}{5}$ $116\frac{1}{5}22$ $27\frac{1}{5}$ $116\frac{1}{5}22$ $27\frac{1}{5}$ $3311\frac{2}{5}2$ $36\frac{1}{5}\frac{1}{5$	$\begin{array}{c} 4\\ 6\\ 8\\ 102\\ 114\\ 16\\ 202\\ 28\\ 326\\ 400\\ 105\\ 205\\ 302\\ 25\\ 302\\ 18\\ 24\\ 30\\ 362\\ 16\\ 424\\ 232\\ 408\\ 564\\ 600\\ 700\\ 824\\ 48\\ 602\\ 284\\ 64\\ 806\\ 922\\ 484\\ 80\\ 9112 \end{array}$						

62

	Length of timber—feet.														
End di- men- sions.	10	12	14	16	18	20	22	24							
				Contents	—board f	eet.									
Inches.															
5 x 8	331	40	463	531	60	663	734	80							
6 x 6	30	36	42	48	54	60 <sup>°</sup>	66	72							
8	40	48	56	64	72	80	88	96							
10	50	60	70	80	90	100	110	120							
12	60	72	84	96	108	120	132	144							
14	70	84	98	112	126	140	154	168							
16	80	96	112	128	144	160	176	192							
8 x 8	$53\frac{1}{3}$	64	$74\frac{2}{3}$	$85\frac{1}{3}$	96	1063	1173	128							
10	$66\frac{2}{3}$	80	931	$106\frac{2}{3}$	120	1333	1463	160							
12	80	96	112	128	144	160	176	192							
14	931	112	$130\frac{2}{3}$	1493	168	1863	$205\frac{1}{3}$	224							
10 x 10	833	100	1163	$133\frac{1}{3}$	150	$166_{3}^{2}$	$183\frac{1}{3}$	200							
12	100	120	140	160	180	200	220	240							
14	1163	140	$163\frac{1}{3}$	$186\frac{2}{3}$	210	$233\frac{1}{3}$	$256\frac{2}{3}$	280							
16	$133\frac{1}{3}$	160	$186_{3}^{2}$	$213\frac{1}{3}$	240	$266_{3}^{2}$	$293\frac{1}{3}$	320							
12 x 12	120	144	168	192	216	240	264	288							
14	140	168	196	224	252	280	308	336							
16	160	192	224	256	288	320	352	384							
14 X 14	1633	196	2283	2013	294	3205	3093	392							
16	1863	224	2013	2983	330	3133	4103	448							
18	210	252	294	330	3/8	420	462	504							
16 X 16	2133	200	2983	3413	384	4203	4093	512							
18	240	288	330	384	432	480	528	016							
20	2003	320	3133	4203	480	0333	5863	040							
18 X 18	270	324	318	432	480	0-±0 0-202		048							
20 X 20	3333	400	4003	0333	700	0003	1003	800							
22 X 22	4033	484	0043	0403	120	0003	1 056	1 1 1 5 9							
24 X 24	480	070 676	7002	108	1 614	900	1,000	1,102							
20 X 20	6521	701	1003	1 0151	1,014	1,1203 1,2062	1,2003	1,502							
20 A 20 20 X 20	750	000	1 050	1 200	1,170	1,5003	1,4573	1 800							
30 X 30	100	900	1,000	1.200	1,300	1,300	1,000	1,800							

#### TABLE 5.—BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER—Continued.

1

	Length of timber—feet.													
End di- men- sions.	28	32	34	36	38	40								
			Contents-	-board feet.										
Inches.	1493	1703	1814	192	2028	2134								
10	186#	2131	2263	240	2531	266%								
12	224	256	272	288	304	320								
14	2611	2983	$317\frac{1}{3}$	336	$354\frac{2}{3}$	$373\frac{1}{3}$								
10 x 10	$233\frac{3}{3}$	$266\frac{3}{3}$	$283\frac{3}{3}$	300	$316\frac{3}{3}$	$333\frac{3}{3}$								
12	280	320	340	360	380	400								
14	$326\frac{2}{3}$	$373\frac{1}{3}$	<b>39</b> 6≩	420	4433	<b>4</b> 66 <del>3</del>								
16	$373\frac{1}{3}$	$426\frac{2}{3}$	$453\frac{1}{3}$	480	$506\frac{2}{3}$	$533\frac{1}{3}$								
12 x 12	336	384	408	<b>9</b> 32	456	480								
14	392	448	476	504	532	560								
16	448	512	544	576	608	640								
14 x 14	4573	$522\frac{2}{3}$	5553	588	$620\frac{2}{3}$	6533								
16	5223	5973	$634\frac{3}{2}$	672	7093	7463								
16 - 16	288	072	/14	700	798	840								
10 X 10	0913	0823	1203 010	108	8103	8003								
18	012	708	810	804	912	1 0682								
19 - 19	7403	0003	9003	900	1,0103	1,0003								
$10 \times 10$ 20 $\times 20$	6221	1 0662	1 1221	1 200	1.020	1,050								
20 A 20 99 Y 99	1 1901	1 2002	1,1003	1,200	1 5392	1,0003								
24 x 24	1 344	$1,250_{\overline{3}}$ 1,536	1 639	1,402	1 894	1 920								
26 x 26	1 5774	1 8023	1 9153	2 028	2 1402	2 2531								
28 x 28	1.8291	2.0902	$2.221^{1}$	2.352	2.4823	2,6134								
30 x 30	$2.100^{3}$	$2,400^{3}$	$2.550^{3}$	2.700	$2.850^{\circ}$	3,000								
00 00	_,100	=, 100	-,000	2,100	2,000	5,000								

#### TABLE 5.—BOARD FOOT CONTENTS OF STANDARD SIZES OF TIMBER—Continued.

# TABLE 6 .- STANDARD CONVERTING FACTORS.

The following converting equivalents will be used in reducing various products to feet, board measure:

Product.	Assumed di- mensions.	Equiva- lent in board feet.
Long cord (chestnut acid wood) Cord (spruce pulpwood) Cord (shingle bolts) Cord (fuel) Load (in the rough) Pole (telephone) Do Pile Stull Tie (standard) Tie (2d class) Tie (anrow gauge) Do Derrick sole Derrick sole Derrick sole Derrick sole Derrick sole Derrick sole Do Miming timber Prop Converter pole Pol Niming timber Prop Converter pole Pol Do Do Stiek Stab Post Post Post Post Post Post Post Post Post Prop Post Post Post Prop Post Post Prop Post Prop Post Post Prop Post Prop Post Prop Post Prop Post Prop Prop Post Prop Prop Post Prop Prop Prop Post Prop Prop Prop Prop Post Prop Prop Prop Prop Post Prop Prop Prop Prop Prop Prop Post Prop	4' x 5' x 8' 4' x 5' x 8' 4' x 4' x 8' 4' x 4' x 8' 1 cord 7'' x 30' 7'' x 30' 7'' x 30' 6'' x 7'' x 8' 6'' x 7'' x 8' 6'' x 7'' x 8' 6'' x 7'' x 8' 7'' x 16' 7'' x 10' 6'' x 7' 5'' x 6' 1 pole 5''' x 6' 5''' x 7' 10''' x 10' 5''' x 7' 10''' x 10' 10''' x 10' 10'''' x 10' 10''''''''''''''''''''''''''''''''''''	board feet. 625 560 600 600 3334 3334 600 600 600 300 200 600 300 200 300 480 700 200 300 480 700 200 300 480 700 200 300 480 700 200 300 300 480 700 200 300 300 480 700 200 300 55 75 75 75 75 75 75 75 75 75 75 75 75 75 30 300 300 75
Brace Stay (fonce). Stay. Shake Picket. Stake (fence).	$\begin{array}{c} 4'' \ge 6' \\ 2'' \ge 6' \\ 4'' \ge 6' \\ 3'' \ge 6'' \\ 3'' \ge 5' \\ 5' \\ 3'' \ge 5' \\ 5' \\ 5' \\ 5' \\ 5' \\ 5' \\ 5' \\ $	

This list gives the standard dimensions and board feet equivalent of each product. These converting factors will be used uniformly unless the dimensions of local products do not approximate those given in the table, in which case board-foot equivalents applicable to the correct dimensions should be used.

These factors are designed primarily for converting other products than saw timber into feet, board measure, for convenience in statistics. Appraisals may be made where desirable on other units common in local usage.

# TABLE 7.-CONVERTING FACTORS-CHESTNUT TELEPHONE POLES.

				I	/engt	h of	of pole-feet.							
Top diameter inside bark.	20	25	30	35	10	45	50	55	60	65	70	75		
	-		(	onte	ents-	-boa	rd fe	et in	tens					
Inches. 5 6 7 8 9 10 11 12	1 2 4 5	3 4 5 7		$\begin{array}{c} 6 \\ 8 \\ 10 \\ 12 \\ 15 \\ 18 \\ \cdots \end{array}$	8 10 13 16 19 24	10 13 16 20 25 30	13 16 20 25 30 37 45 53	$10 \\ 2) \\ 25 \\ 31 \\ 38 \\ 45 \\ 52 \\ 61$	$20 \\ 25 \\ 31 \\ 38 \\ 46 \\ 54 \\ 62 \\ 71$	$25 \\ 31 \\ 39 \\ 47 \\ 55 \\ 63 \\ 72 \\ 82$	$31 \\ 39 \\ 47 \\ 56 \\ 65 \\ 75 \\ 85 \\ 96$	39 48 58 67 77 89 101 114		

[Based upon taper measurements.]

Diam- eter.	Area.	Diam- eter.	Area.	Diam- eter.	Area.	Diam- eter.	Area.
Inches. 1 2 3 4 5	Sq. ft. 0.01 .02 .05 .09 .14	Inches. 21 22 23 24 25	Sq. ft. 2. 41 2. 64 2. 89 3. 14 3. 41	Inches. 41 42 43 44 45	$\begin{array}{c} Sq.ft.\\ 9.17\\ 9.62\\ 10.08\\ 10.56\\ 11.04 \end{array}$	Inches. 61 62 63 64 65	<i>Sq. ft.</i> 20. 29 20. 97 21. 65 22. 34 23. 04
6 7 8 9 10	20 27 35 44 55	26 27 28 29 30	$\begin{array}{c} 3.\ 69\\ 3.\ 98\\ 4.\ 28\\ 4.\ 59\\ 4.\ 91\end{array}$	46 47 43 49 50	$11.54 \\ 12.05 \\ 12.57 \\ 13.10 \\ 13.64$	66 67 68 69 70	$\begin{array}{c} 23.\ 76\\ 24.\ 48\\ 25.\ 22\\ 25.\ 97\\ 26.\ 73\end{array}$
$11 \\ 12 \\ 13 \\ 14 \\ 15$	. 66 . 79 . 92 1. 07 1. 23	31 32 33 34 35	$5.24 \\ 5.59 \\ 5.94 \\ 6.31 \\ 6.68$	51 52 53 54 55	$14. 19 \\ 14. 75 \\ 15. 32 \\ 15. 90 \\ 16. 50$	71 72 73 74 75	27. 49 28. 27 29. 07 29. 87 30. 68
16 17 18 19 20	1.40 1.58 1.77 1.97 2.18	36 37 38 39 40	7.07 7.47 7.88 8.30 8.73	56 57 58 59 60	$17.10 \\ 17.72 \\ 18.35 \\ 18.99 \\ 19.63$	76 77 78 79 80	31, 50 32, 34 33, 18 34, 04 34, 91

## TABLE 8.-AREAS OF CIRCLES.

#### TABLE 9.-TAPER.

Total length.	Log lengths.						
	Butt log.	Second log.	Third log.	Top log.			
Feet							
18	$10'_{$			8'			
Increase	1"			107			
Increase	10			0"			
22	12'			10'			
Increase	1″			0"			
Increase	12'	•••••	•••••	0"			
26	14'			12'			
Increase	1″			0"			
28	14'		•••••	14'			
30	16'			14'			
Increase	2"			0″			
32	16'			16'			
Increase	2″ 12′	197		10'			
Increase	3"	Ĩ″		°″			
36	12'	12'		12'			
Increase	3"	1″		0"			
Januara Indrassa	14 <sup>-</sup> 2"	12'		0"			
40	16'	12'		12'			
Increase	3″	1″		0"			
42	16'	14'		12'			
44	16'	16'		* 12'			
Increase	3″	1″		-ō″			
46	16'	16!		14'			
Increase	4"	. 2"		0″ 16′			
Increase	4"	2"		0"			
50	14'	12'	12'	12'			
Increase	4"	3″	1"	0"			
JZ	16'	12'	12'	0"			
54	16'	14'	12'	12'			
Increase	5"	3″	1″	0″			
56	16'	16'	12'	12'			
111CT@ase	9″ 16′	16'	14'	12'			
Increase	5″	3″	2"	-0″			
60	16'	16'	14'	14'			
Increase	ō″	3″	2"	0″			

# [For scaling in maximum lengths of 16 feet.]

This table is intended to be used simply as a guide; the allowances for taper shown in this table should be varied to conform to the *actual taper*.

# TABLE 10.-TAPER.

[For scaling in maximum lengths of 32 feet.]

(D. do bloor oth	Log lengths.						
ı otal lengtn.	Butt log.	Second log.	Third log.	Top log.			
Feet.							
34	187			167			
Increase	2''			0''			
36	187	· • • • • · · · • • • • · · · ·		18'			
increase	207		• • • • • • • • • • • • •	18/			
Increase		•••••		10°″			
40	207			20'			
Increase				-0″			
42	22'	1		201			
Increase	2"	· • • • • • • • • • • • • • •		-0''			
44	22/	· • • • • • • • • • • • • • • • • • • •		227			
increase	200			0.0			
40 [noreace	21			22.77			
48	947			24'			
Increase	3''			0"			
50	26'			21'			
Increase	3''			0''			
52	26'			26'			
Increase	3''			0''			
34	28'		•••••	26'			
increase	3	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·				
Increase	<u>-</u>			~°°′			
58	30'			287			
Increase	4''			-ŏ′′			
60	307			30'			
Increase	4''		<b></b> .	0''			
62	32'		<b></b>	30'			
Increase	4''		· · · · · · · · · · · · ·	0			
64	32		<b></b> .	32			
AR		221		297			
Increase	6''	4''		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
68	24'	22'		22'			
Increase	ô''	4''		0''			
70	241	24'		22'			
Increase	6''	4''		0''			
72	. 24'	24'	• • • • • • • • • • • •	24'			
increase	6''	4''	• • • • • • • • • • • • • •	0''			
Increase	20	5//		24 1)''			
76	26/	26'		24'			
Increase	7''	5"		-ô''			
78	26'	26'		26'			
	,	1		011			

68
### APPENDIX.

	Log lengths.								
Total length.	Butt log.	Second log.	Third log.	Top log.					
Fect.   \$0	28' 7'' 28' 8'' 30' 8'' 30' 8'' 32'' 32'' 32'' 32'' 32'' 32''	26' 28' 28' 5'' 28' 5'' 30' 5'' 30' 6'' 30' 6'' 32' 6'' 32' 5''		26' 0'' 28' 0'' 28' 0'' 28' 0'' 30' 30' 30' 30' 30' 30' 30' 30' 30					
98 Increase 100 Increase	9 26' 9'' 26' 10''	$24' \\ 8'' \\ 26' \\ 8''$	24' 5'' 24' 5''	0 24' 0'' 24' 0''					

### TABLE 10.-TAPER-Continued.

This table is intended to be used simply as a guide; the allowances for taper shown should be varied to conform to the actual taper. These figures are based on the actual taper of 110 Douglas fir trees of average height measured in Washington and Oregon.

### SAMPLE PAGE 1-FORM

Purch	aser,		John	Sm	ith				
Timber,	Sale,	5	-20-	12	ΕΕ	nd Mark,	No	ne.	
SPECII 8380	is M	est	ern	Yello	w Pi	ne			
Los No.	LEN	а <b>?</b> К.	Ъч.В М.	Log No.	1/енсти	<b>Бт. В. М.</b>	Log No.	LENGTA.	Fr. B. M.
50	1 16	;	40	21	12	35	5 11	14	60
	2 14		57	22	16	43	42	12	75
	8 12	>	53	23	. 16	24	43	16	53
	4 20	2	36	24	18	60	44	16	20
	5 i E	. 0	12	25	14	CUII	45	14	8
	6 14	6	cull	26	12	15	46	14	13
	7 16		6	27	16	<sup>©</sup> 37	47	12	CUII
	8 16	(C)	9	28	14	54	48	20	98
	9 12	>	25	29	16	75	49	16	3100
	10 14		57	30	16	87	50	18	49
	11 /6	Ű	60	31	14	18	51	14	57
	12 /6		92	32	14	.10	52	12	23
	13 14	7	10	33	12	10	53	16	10
	14 14		12	34	10	cull	54	16	12
	15 /2	_	10	35	16	28	55	16	55
	16 14	Ð	20	36	20	_ 30	56	16	30
	17 16		18	37	14	© 50	57	10	65
	18 16		21	88	12	42	58	14	46
	19 16		24	39	16	64	59	12	25
	20 /8	, c	011	40	15	75	60	14	18
		5	562			757			817

5620

Chas Brown F.R. Scaled by

70

# 231-SAW TIMBER.

Where	e Scale	1, <u>A</u> t	L rai	Iroa	nd la	nd	ing	r N	6.5	8. 6
Compar	tment,	<b>?;</b> See	c., <u>25</u> ;	T., <u>5</u>	; R.,4	<i>E</i> ; 1	Date	9-,	<u>, 19</u>	902
SPECIE	6									
Log No	LENGTH	FIBM.	Log No.	Lengty.	Fr. B. M.		RI	MAR	KS.	
5 61	16	37	<b>5</b> 81	12	15	Oti	her	Sp	)ec	ies
62	16	59	82	14	18	are		eća	ora	'ed
63	12	21	83	18	46	on	ot.	hei	r pa	āges
64	16	16	84	16	0 78	or	in	01	he	r
65	14	35	85	16	39	bo	ok	s.,		
66	18	67	88	14	cull					
67	18	95	87	20	105					
68	12	41	88	12	27					
69	12	9	89	12	50					
70	14	10	69	16	cu11					
71	16	cull	91	16	53				0	0
72	16	74	92	16	10				121	2
73	14	_ 49	93	14	17				Ő.	2
74	14	9 57	94	16	29			ĨĨ.	5	2
75	20	24	95	12	- 8			EPOI	N	01
76	16	6	5145	16	<sup>©</sup> 56	39	ARD.	ST B	1	1/2
77	16	30	97	14	49	Vd s	ORW	E LA	5	20
78	14	89	184	16	60	шт	ILT F	SINC	TED	DT.
79	12	- 57	89	16	cull	T.M.,	5.101	TAL.	POK	TAL
80	12	<sup>(4)</sup> 36	00	14	36	10	B	TO	RF	D.I.
		812			696					
						0	0	0		
		~			~	44	2	õ		
		5			90	Ő.	0	2		
		8			69	., )	2	4		
					-					

SAMPLE PAGE 2-FORM



## 231-D1-SAW TIMBER.

SEC 20_T. 58NR 4-W. DATE 9/12_1910												
SCAL	ER	1	al	bli	-2	m	asi	<u>-</u>				4
Karch Cedar D.F.	SPE	CIES	19. Ano	Larch	Cedar	D.Fir						
BM	106	UM"	F	4	-1		REMA	RKS	ON			
++++++++++	76	16	19			44	PAG	<u>.</u>				
┟┽┼┠┼┼╂┾╎	27	16		-21	++							
- #/	78	16		+++	+++	40	NO	PCS	BY.	SPEC	CIES	
	\$ 29	18		+	23		218	ñ	~	0	- 0	_
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	82	16		-33		++	20	-	-	-		_
	983	14			+++	14	7 10	~	4	0	¥.	
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	94	16	24				511		2	R	1	
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63745-15-4

THE SCALING OF NATIONAL FOREST TIMBER.

SAMPLE PAGE 3-FORM

Purchaser \_\_ Snaqualmie\_ Logging\_ Ca\_\_\_\_\_

Compartment \_\_\_\_\_ Sec. 2.3\_\_ Twp. \_31\_\_\_ R 9EWM.

									the second se
	++	eter 163	۰.		CONTE	NTS BY	SPECIES	5	Defects, Kind, Amount
Log NO	Leng	Diam	Tape	Doug Fir	Hem- lock	Cedar	Dead Loug.Fir		Deducted, Overlangths
2561	16					15			SI (Slab)
2	16					10			SI
3	40					24			51
4	40					20			51
5	32	27			96				145 (Shake)
6	32					42			51
7	40	15	1		34				4C (Conk.)
З	40	21	1		74				6-3
9	40	38	1				. 138		60-PK (Punk or)
70	34	32					131		30-PR (Pitch ring)
1	40	30	1		166				65
2	40	30	1	Cull					172C
z	32	22			67				
4	26	20	-		45				
5	40	33	2			177			30 R. (Center rot)
6	26	20				45			
7	28	35		93					60C
3	40	14			24				achs
9	32	14			18				5C/15
80	40	51	1	456					40-PS(Pitch seam)
	1	Pire.		5:45					
		-			1				
	ECLES	Lea Pcka			5.2				
	Ids-SLI	Cedar				3.33			ų
	TOT	Dead					2.00		

74

### 631-SAW TIMBER.

۰.

Timber Sale\_\_\_\_\_6-4-10\_\_\_\_\_Brand U.S. SL

Where Scaled\_At\_Janding\_\_\_\_\_Date 10-3111-1\_12

-				_								the second s
	L. No	ath T	eter hes	r	CONTENTS BY SPECIES			Defe	ots Kir	d Amount		
	Log No.	Len	Diar	Tap	Doug. Fir	Hem- lock	Cedar	Deng. Peng. Fir		Dedu	cted, C	verlengths
	2581	32	54		407					30	PR	
-	2	40	49	2	448					20	ps	
-	3	40	46	1	393					12-	PS	
-	4	40	50	2	471					16	PS	
_	5	36	47	2	343					45G	RIGro	und Rot)
	6	40	53	2	510					36	PS	
	7	40	45	1	388							
	8	32	40		232					91	PS	
	9	40	17	1		46				4.	s	
	90	32	15			26				23	5	
	1	38	11	1		17		-			•	
	2	40	12	1			19			31	3	
-	3	54	20	1		56				5.	3	
	4	38	29	1	146					4.	PS	
-	5	40	14	1		32						
-	6	32	16			32						
-	7	40	20			73				t		
	8	40	34	1				165		44	PK	
	3	32	14			23						
	2600	32	13			19						
					80 E K E	\$.2¢	6/	1.65		4.34 3.52 8.48 38.87	Transferred to Journal Page (.02	Scoled by John Dar
												1

SAMPLE PAGE 4-FORM 631-SAW

Purchaser Snoqualmie Logging Co											
	111 200										
Page	Doug'as Fir	Hemlock	Cedar	Dead DouglAS FIR	Dead Cedar						
1.	1.05	394	2214	876	129						
2.	1964	1537	1175	1208	80						
3.	2572	1266	985	374	142						
4.	1876	780	1343	1163							
5.	2432	338	1334		457						
Totals/1/12	8949	4915	7051	3621	808						
	1			1							

76

# TIMBER, SUMMARY SHEET.

.

•

101 Timber Sale \_ Number\_of \_Pieces\_\_\_\_

Page	Douglas Fir	Hemlock	Cedar	Dead Douglasfir	Dead Cedar
1.	1	4	14	6	4
2.	5	/6	9	8	2
<b>3</b> .	8	7	20	7	5
4.	12	10	5	7	
5.	20	10	1		19
Totals	46	47	49	28	30

SAMPLE PAGE 5-FORM 231-

Purchaser, . 77	HE E	ACLE.		PULP	<i>GO</i> .		
Tumber Sale, 2/	4/12 -	Tonge	<u>755</u> Er	nd Mark,	••••		**
SPECIES Wes	tern	Hemi	оск				
Kons No. LSHUSH. D-2	CU. FT	Lon No.	Гамати.	F7. B. M.	Lou No	Lesoth	PE B. N
1 8-20	2	21			41		
<sup>2</sup> 6-16	3	35			43		
<sup>3</sup> 20-18	39	20			43		
<sup>4</sup> 34-40	_ 252	24			44		
5 40-40	<sup>G</sup> 300	25			45		
<sup>6</sup> 24-30	CUII	26			46		
7 38-26	205	27			47		
845-14	155	28			48		
<sup>9</sup> 36-34	240	29			49		
<sup>10</sup> 23-40	115	30			50		
11 36-40 20-40	370	31			51		
<sup>12</sup> 8-30	10	34			53		
13 8-24	CUII	:33			23		
14 25-30	100	34			54		
15 11-36	24	35			, 55		
<sup>16</sup> 23-38	110	36			54		
17 29-23	105	:17			57		
<sup>18</sup> 10-36	200	38			58		
<sup>19</sup> 2340	115	39			59		
<sup>20</sup> 25-30	102	40			60		
	2.452						
uğ	ds						

TUTAL

27.24 CON

Sucled by James Lowers.

# APPENDIX.

## CUBIC FEET AND CORDS.

Where	Scale	d, IN.	RAI	F7						õ
Compart	tment	: Sec	: <b></b> :	<i>T</i>	; R.,	-·· ;	Date.	7/4	4 . 19	1:4
SPECIE	5									
Lou No.	Lengra.	<b>№</b> . В М	Los No.	1.88670	F (=B,M		ĸ	ьма к	ĸs	
61			81			90	Co	1. F.	2 50	stid
68			82			ec	, vi	Val	en	+ TU
04			5			01	7e (	cor	d.	
64			· 84							
65			85							
66			86							
57			87							
68			38							
69			89							
70			90							
71			91							
72			92							1
73			\$3						Ø.	
74			94					Ĕ.	×.	V.
75			95					EPOF	4	N.
76			96			30	ARD.	STR	0	Ž.
77			97			S PA	ORW	E LA		~
78			98			THI	ur F	ONIS	. CII	то.
79			99			TAL,	0.10	TAL	POR	TAL
80			00			TO	91	10	Rħ	TO
						24	36	60	50	80
						00	125	152	264	410

SAMPLE PAGE 6-FORM

S, PIKE (Forest)	Sales
John Doe	Uan. 15, 1914
(Purchaser)	(Date)

Species Material

DATE SCALED

Cordwood - Mixed Species No Pieces No Pieces No. Pieces No. Pieces No. Rick Height Length Width Cords

Mar.	13	5	4.5	40	4	5.6
••	••	6	4.	40	4	5.
.,		7	3.5	32	4	3.5
		8	4	50	4	6.25

		EET.	20.35
5		LINEAR F	
Remarks o	rage Item	NO. PIECES	

compartment, scaler, c	/0/11		10	1.9		
Sec. 23 , T. 4N , R. 6W ,		(wh	ere sca	led)		•
No. Pieces	MISCELLANEOUS					
	MISCELLANEOUS	20.35	40.50	60.35	100.15	161.00
	RAILROAD TIES	Cords	:			
-	GRAND TOTALS	Total this page	Brought forward	Total since last report	Reported to Mar /	Total to Mar 15
	LINEAR FEET					
	tor Picces					

SAMPLE PAGE 7-FORM

Purchaser, John Doe Aug. 10/10

Compar	rime	nt,		;	Sec.,	6	., Twp.,	141	N.; R., ZW.	
Log No.	LENGTH, FELT.	DIAMETER, INCRES.	TAFFR.	Dovo. Fir.	CUNTI HEM- LOCK,	ENTS BY : Cedar.	SPECILS.		Defects, Kind, Amount Deducted, Overlength	r s.
02, SV		ре! "Діє		For Loh ord	wara s ru are . The r	f fro ning enter unb	m pa the red su	ge san para	4.3 Pe number Hely under 2 cords and	
Scale report		of ent The into ada	201 21 21 21	a li ed All stat core	olts und of of af ade	fron er "C thes vald v an to the	p_eau ords' e_en bolks ave e_tota	sp lo and is rag. d un	t are then "Bolis" s are totaled converted e figure, and der "Cords.	× × ·
	TOTALS-SPECIES.	CEDAR. HEM. DOUG.		T Farv	Total Nara	+h1.	s pa page	ge 82		

### 651-SHINGLE BOLTS.

Timber Sale, Dead 52" Brand, ... DIAMETER, INCHES. CONTENTS BY SPECIES. LENGTH, FEET. DEFECTS, KIND, AMOUNT DEDUCTED, OVERLENGTHS. Log No. TAPER. Dorg. HEM-LOCK. CEDAR. Fin. Bolts Cords ece 12 3 a 21 7 22 23 5 6 14 botts left are carried over The odd to the next page. This number aleducted from the total under "Pieces" total only what t has leaving in that been converted cords. 6 f different length and bolts cut from areen and dead timber recorded on separate pages should be 336 14 29 22 422 / FRANSFERRED TO JOURNAL, PAOE 329 PAGE. 15 7 FOB 329 15 TOTAL8 BOALED BT-7 7

### SAMPLE PAGE 8-FORM

Purchas	ser,	10hn	Doe					
Timber So	ıle, <u>7</u>	-1-14	1010	Er	nd Mark,			
SPECIES	С	edar	Pole	5	1			
Loo No	LENGTH.	Ft. B. M.	Log No	LENGTH.	Fr. B. M.	Log No.	LENCTH,	Ft. B. M.
1	FT. IN. 40-8		21			41		
2	25-6		್ತಿ			42		
8	25-6		23			43		
4	25-7		24			44		
5	30-6		25			45		
6	45-8		26			46		
. 7	40-8		27			47		
6	25-7		28			48		
9	5.5-8		29			49		
10	50-8		30			50		
11	45-8		31			51		
12	25-7		32			52		
13	40-8		33			53		
14	25-7		84			54		
	50-8		35			55		
16	25-7		36			56		
	40-8		37			57		
18	30-6		38			58		
19	50-8		39			59		
20	25-6		40			60		

TOTALS.

Scaled by Richard Roe A. F. R

# 231-TELEPHONE POLES.

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Where	Se	cal	ed,	<b>.</b>	11	7	No	00	<u> </u>			 D		~		~~~	9/		104	8 //
Compart	tmei s	nt,		;	Se	C., <u>4</u>	-/_	_;	1.,_		;	R., <u>4</u>	1	.; .	Dat	e,	7.2.6			
8-380 Log No.	LE		. 1	т. В.	м.	L	og N		LENG	ти. Тев	FT.	в. м				REM	IARI	τs.		
61							8	31												
62								32												
63			_					33					_							
64								34					_							
65			_					35												
66								36												
67			_				8	37					-							
68			_				1	38					_							
69			_				1	39												
70								90		_			_  -							
								91					-							
72								92					-							
73	-		-		-			93		_										
								94					-							
75	-		+		-			95					-							
								96												9
77								97					-							ECE
78			+		_			98					-							۲. ۲
79	-		-	•••••	-		!	99					-							TOTA
80		1.						00												
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NUMBER BROUGHT FORWARD	3	5	10	25	14	ы	~	R		8	20	`	8	~			£		`	100
NUMBER THIS PAGE			3	Ś	7						4		Я	η	/					20
<u>и</u> , н	20-5	20-6	25-6	25-7	30-02	30-7	30-8	35-7	35-8	40-7	40-8	45-7	45-8	50-8	55-8	60-8	65-8	70-8	75-8	

SAMPLE PAGE 9-FORM

	DU,	RCI	443	SEI	9	Qo.	hn	, 2	Bro	w	n			
7	IM	BE	R.	5A	LE!		1	10	8_				_	
SPEC	CIES	16/es 2593	Poles	Poles	Piling	SPEC	V.S	Po/es 25430	10/es 40660	Poles 65450	Piling	SPEC	NES	Pb./cs 25639
LOG No	ENCI	۷.	INE	4 <i>R</i> /	<i>ст.</i>	2.0G No	LEN <sup>GIN</sup>	2	INE,	ARF	7.	20G No	ENGT	LIN
1		25				26		30	ПП	TH		51		30
2					90	27			60	TT		52	-	30
3			40			28		25			30	53		
4		35				29					35	54		TT
5		30			ITT	30				65		55		
6				65		31				20		56		
2		25			III	32		. 35				57		
8			40	Π		33		25		TT		58		25
9		30				34			50	TT		59		30
10		25				35			50			60		25
11		35				36			55			é!		35
12					40	37		30				62		
13				20		38				80		63		
14		25			ITT	39				TI	40	64		
15		35				40		30				65		30
16		35				41			20			66		30
17						12			50			67		30
18					45	43		30				68		
19			60			44		30		TE		09		
20		30				45		30				70		
21		25				46			60			71		
22					45	47				25		22		
23				80		48		30				73		
24					60	19		25				74	-	
25		30				50					10	75		30
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1	102		-	-		-							-	
X	1							5				F	-	1
6	55	- 8	_		-		-	0						-8
K	22			-				)				<b>—</b>	-	
	20											-	-	

# 231-D1-LINEAR FEET.

SEC. J	20_7.	56 N.R	3E-L	DATE 9/12_1910	
SCAL	ER/	Pal ph	- 1 m	east	3
Poles Ales Piling	SPECIES	1'oles Foles	Fures Aling		
FAR FT	200 100	LINE	ARFT	DEMARKS ON	
TTITIT	100	TIL	ΪΠΤ	2105	
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	22	40			
-49	78			NO. PCS BY SPECIES	
	29	30		600400	
	80	30		Q	
#0	81	┟┼┼┠┼┼╷	20	8 4 9 9 8 8	
	82		65		
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	85		30		_
	86		30	50000	
45	82		60	No A O S	-
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50	89	30		à	
	90	25		1 2 8 0	
	91	30		0 1 2 2 0	
	92	50		22128	
50	93	1150			
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	25	50			
	95		65		
	02				
	193	20		28282	
	99	1201			
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SAMPLE PAGE 10-FORM 648-

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S	. L	INTA	7		Ξ.	Sale	s	
J. C.	Broi	VIT & (Purchaser)	Co.			Nor.	10 (Date	<i>1913</i>
Species Muterial	Gro Loc 8 Ft	een dige - Po. Prons 10	le Pii	7 <i>C</i> 12 F7 Amo	• 14 8	Amo	. 16.	9 Anne
DATE SCALED	No.	PIECES NO	. PIECES	No. Pieces	No.	PIECES	No	PIECEN
Dec. 15, 1.	3 <sup>(3)</sup>	40 (10)	32 "	26	(22)	14	(31)	43
	(4) (5)	65 (12)	44 "	, 19) <b>38</b>	(23)		(33)	57
0 00'	(4)	92 (10)	61	<b>43</b> 20)	(23)	24	(31)	75
Dec 20, 13	(6)	39 (1)	34	<sup>(9)</sup> 70	(22)	18	(32)	62
Dec.28%	3(7)	~14 12 7 <sup>(12)</sup>	150	<sup>18)</sup> 68	(EI)	42 27	(31)	100
	(3)	72 (13)	64 (	<sup>(7)</sup> 48	(22)	23	(32)	63

Figures in ( ) indicate serial nos.

		LINEAR FEET	5488	4930	4368	2072	9632
Remarks o	Page 20 Item (c)	No. Pieces	636	<i>4</i> 93	364	148	

APPENDIX.

PROPS, TIES, AND POSTS.

Compartmen	t //	Sca	ler,	<u>Ģ</u> . 1	<i>B.</i> /	lar	dir	8	
Sec. 18 .	T. 2.N.	, R. 114	5	Mi	11 C (Wh	ere scal	217 ed)	dii	ngs
18 Ft. Props Ry No Pieces FT (50)	Ties Ry rsts Se (62) 84	Ties Pa conds Nu 12	osts mber 21	Posts Miscellaneous	231	416	642	1527	2174
(40) (51) (41) 28 (52) (40) 20 (52) (41) 41 (53)	124 <sup>(63)</sup> 261 294 <sup>(66)</sup> 420 <sup>(67)</sup>	20 <sup>(7))</sup> 36 <sup>(72)</sup> 26 <sup>(70)</sup> 36 <sup>(71)</sup>	36 48 37 52	2nd class Ties Miscellaneous	195	264	459	1824	2283
(49) 56 36 (41) 17 <sup>(50)</sup>	602 <sup>(62)</sup> 2/2 <sup>(63)</sup>	45 <sup>(70)</sup> 20 <sup>(71)</sup>	27 10	RAILROAD TIES	2097	3147	5244	25230	30474
of piles	۰,			GRAND TOTALS	Total this page	Brought forward	Toțal since last report	Reported to DEC.1.13	Total to Jan. 1 14
2772				LINEAR FEET	29262	21244	50506	162218	212 724
154	2097	561	231	No. PLECES	2447	2020	イロヤヤ	10564	15031

#### 90 THE SCALING OF NATIONAL FOREST TIMBER.

# DOUGLAS FIR LOG GRADING RULES OF THE PUGET SOUND LOG SCALING AND GRADING BUREAU.

# No. 1 Logs.

No. 1 logs shall be logs in the lengths of 16 to 32 feet and 30 inches in diameter inside the bark at the small end and logs 34 to 40 feet, 28 inches in diameter inside the bark at the small end and shall be logs which in the judgment of the scaler shall contain at least 50 per cent of the scaled contents in lumber in the grades of No. 2 clear and better

# No. 2 Logs.

No. 2 logs shall be not less than 16 feet long and having defects which prevent its grading No. 1, but which in the judgment of the scaler will be suitable for the manufacture of lumber principally in the grades of merchantable and better.

# No. 3 Logs.

No. 3 logs shall be not less than 16 feet long and having defects which prevent its cutting into higher grades and in the judgment of the scaler will be suitable for the manufacture of common lumber.

# DOUGLAS FIR LOG GRADING RULES OF THE COLUMBIA RIVER LOG SCALING AND GRADING BUREAU.

# No. 1 Logs.

No. 1 logs shall be 30 inches or over in diameter inside the bark at the small end, reasonably straight-grained, and not less than 16 feet long and shall be logs which in the judgment of the scaler will contain at least 50 per cent of their scaled contents in lumber in the grades of No. 1 and No. 2 clear lumber.

In a general way it may be said that a pitch ring is not a serious grade defect in a No. 1 log, provided its location and size does not prevent the log cutting the requisite amount of clears. The same applies to rot.

Pitch pockets, seams, knots, etc., are defects which impair the grade in proportion to their effect on the amount of clears the log contains. A No. 1 log will admit a few small knots, but must be surface clear for at least four-fifths its length; a few pitch pockets, as permitted in the grades of clear lumber, but no combination of defects which will prevent the required percentage of clears.

### APPENDIX.

# No. 2 Logs.

No. 2 logs shall be 16 inches or over in diameter inside the bark at the small end, not less than 16 feet long, and having defects which prevent its grading No. 1, but which will in the judgment of the scaler be suitable for the manufacture of lumber principally in grades of merchantable and better.

## No. 3 Logs.

No. 3 logs shall be 12 inches or over in diameter inside the bark at the small end, not less than 16 feet long, having defects which prevent its grading No. 2, and shall in the judgment of the scaler be suitable for the manufacture of inferior grades of lumber.

## Cull Logs.

Cull logs shall be any logs which do not contain 50 per cent of sound lumber. All logs to be scaled by the Spalding rule.

## WESTERN YELLOW PINE LOG GRADING RULES, SUGGESTED BY THE FOREST SERVICE, FOR USE IN EASTERN OREGON AND WASHINGTON.

Clear logs shall be 22 inches or over in diameter inside the bark at the small end and not less than 10 feet long. They shall be reasonbly straight-grained, practically surface clear, and of a character which in the judgment of the scaler are capable of cutting not less than 25 per cent of their scaled contents into lumber of the grades of C select and better.

Shop logs shall be 18 inches or over in diameter inside the bark at the small end, not less than 8 feet long, and which in the judgment of the scaler are capable of cutting not less than 30 per cent of their scaled contents into lumber of the grades of No. 2 shop and better.

Rough logs shall be 6 inches or over in diameter inside the bark at the small end and not less than 8 feet long, having defects which in the judgment of the scaler prevent their classification into either of the two above grades.

















