PART II.

THE WOODS OF THE UNITED STATES.

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A critical examination of the wood produced by the indigenous trees of North America, exclusive of Mexico, has been made in connection with the investigation of the forest wealth of the United States.

Mr. S. P. Sharples, special agent in charge of this department of the investigation, has had general direction of such experiments, and suggested the methods adopted for their execution.

The object of this examination has been to determine, first, the fuel value of the woods of the United States; second, the value as material for construction of the wood of the principal timber trees of the country. The results thus obtained are highly suggestive; they must not, however, be considered conclusive, but rather valuable as indicating what lines of research should be followed in a more thorough study of this subject.

The fuel value has been obtained by a determination of the specific gravity and the ash of the absolutely dry wood, supplemented by a determination of the actual chemical composition of the wood of some of the most important trees; the value of our woods for construction has been obtained by experiments made with the United States testing-machine at the Watertown arsenal. Each specimen as received was at once numbered, and this number, designated in the following tables as "Office number", was carefully repeated on every fragment cut from the original tree, and always refers to the same specimen. In a few cases in the early part of the work a sub-number was used to designate a specimen from another tree of the same species received from the same collector. In most cases the specimens were taken from the butt-cut of the tree, and unless it is otherwise mentioned in the remarks, were free from sap and knots; they may be regarded as representing the best wood that could be obtained from the tree.

The specimens used in the different series of experiments are deposited in the National Museum at Washington and in the museum of the Arboretum of Harvard College. It was found necessary, in order to secure proper material upon which to carry out the various experiments, to obtain a much larger amount of wood of the different species than was actually consumed in the experiments. This surplus material has been worked into 12,961 museum specimens, of convenient size, showing as far as possible the bark, sap-, and heart-wood of each species. These have been made into sixty sets, more or less complete, and distributed to the following educational institutions in the United States and Europe:

Institute of Technology, Boston, Massachusetts.
United States Military Academy, West Point, New York.
Academy of Natural Science, Philadelphia, Pennsylvania.
United States Naval Academy, Annapolis, Maryland.
Sheffield Scientific School, New Haven, Connecticut.
School of Mines, Columbia College, New York, New York.
National School of Forestry, Nancy, France.
Museum of Science and Art, Edinburgh, Scotland.
Agricultural Museum, Rome, Italy.
Brown University, Providence, Rhode Island.
Rensselaer Polytechnic Institute, Troy, New York.
Lawrence Scientific School, Cambridge, Massachusetts.
Iowa Agricultural College, Ames, Iowa.
Administration of National Forests, Lisbon, Portugal.
National Forest Administration, Paris, France.
McGill University, Montreal, Canada.
Royal Botanic Gardens, Sydney, New South Wales.
State Agricultural College, Lansing, Michigan.

Peabody Academy of Science, Salem, Massachusetts.
Arkansas Industrial University, Fayetteville, Arkansas.
Imperial Botanic Gardens, St. Petersburg, Russia.
American Society of Civil Engineers, New York, New York.
Portland Society of Natural History, Portland, Maine.
New Jersey Agricultural College, New Brunswick, New Jersey.
State Agricultural College, Burlington, Vermont.
State Agricultural College, College Station, Maryland.
Union College Engineering School, Schenectady, New York.
Cornell University, Ithaca, New York.
Hampton Agricultural and Normal Institute, Hampton, Virginia.
Pennsylvania State College, State College, Pennsylvania.
Ohio State University, Columbus, Ohio.
Agricultural College of Missouri, Columbia, Missouri.
University of Wisconsin, Madison, Wisconsin.
State Agricultural and Mechanical College, Auburn, Alabama.
University of Minnesota, Minneapolis, Minnesota.
North Carolina Agricultural College, Chapel Hill, North Carolina.
West Virginia University, Morgantown, West Virginia.
State Agricultural College, Orono, Maine.
Georgia Agricultural College, Athens, Georgia.
Massachusetts Agricultural College, Amherst, Massachusetts.
Tennessee Agricultural College, Knoxville, Tennessee.
New Hampshire College of Agriculture, Hanover, New Hampshire.
Illinois Industrial University, Champaign, Illinois.
State Agricultural College, Corvallis, Oregon.
State Agricultural College, Manhattan, Kansas.
Agricultural College of Mississippi, Starkville, Mississippi.
Kentucky Agricultural College, Lexington, Kentucky.
Claflin University, Orangeville, South Carolina.
Purdue University, Lafayette, Indiana.
Botanic Garden, Königsberg, Germany.
Engineer's office, Water-works, Boston, Massachusetts.
Franklin Society, Providence, Rhode Island.
Madison University, Hamilton, New York.
Rochester University, Rochester, New York.
Colby Academy, New London, New Hampshire.

SPECIFIC GRAVITY AND ASH.

The specific gravity and the ash of every tree of the United States have been determined (Table I) by Mr. Sharples, with the exception of the following: *Clusia flava*, once detected upon the keys of southern Florida, but not rediscovered; *Gordonia pubescens*, a rare and local species discovered in the last century upon the banks of the Altamaha river of Georgia and never rediscovered; *Pistacia Mexicana* and *Acacia Berlandieri*, economically unimportant species of the valley of the lower Rio Grande; *Cratægus berberifolia*, a little known species of the Red River valley; *Cupressus Macnabiana*, a rare and local species of California of little economic importance, and *Larix Lyallii*, a rare and local species of the northern Rocky mountains.

At least two determinations of specific gravity have been made for each species studied, and, in the case of woods of commercial importance, specimens were taken from many trees growing in widely different parts of the country, and under different conditions of soil and climate.

The specimens used for specific gravity determinations were made 100 millimeters long and about 35 millimeters square, and were dried at 100° centigrade until they ceased to lose weight. The specific gravity was then obtained by measurement with micrometer calipers and calculation from the weights of the blocks.

Two determinations of ash were made from each specimen studied by burning small, dried blocks in a muffle furnace at a low temperature.

An average of the specific gravity and of the ash of all the specimens taken from the same tree was made, and the average of these averages is given as the final result for the species; equal weight is thus given to each tree in the calculations without regard to the number of specimens representing it.

In the following table the trees of the United States are arranged in the order of the weight of the dry wood:

Catalogue number.	Species.	Relative specific gravity.	Catalogue number.	Species.	Relative specific gravity.	Catalogue number.	Species.	Relative specific gravity.
43	Condalia ferrea	1.3020	163	Guettarda elliptica	0.8337	402	Larix occidentalis	0.7407
44	Condalia obovata	1.1999	159	Viburnum prunifolium	0.8332	273	Quercus coccinea	0.7405
140	Rhizophora Mangle	1.1617	26	Ptelia trifoliata	0.8319	87	Gleditschia monosperma	0.7342
20	Guaiacum sanctum	1.1432	119	Pyrus rivularis	0.8316	77	Robinia Pseudacacia	0.7333
114	Vauquelinia Torreyi	1.1374	237	Quercus lyrata	0.8313	276	Quercus nigra	0.7324
147	Eugenia longipes	1.1235	292	Ostrya Virginica	0.8284	158	Viburnum Lentago	0.7303
21	Porliera angustifolia	1.1101	270	Quercus agrifolia	0.8253	278	Quercus Catesbæi	0.7294
220	Sebastiania lucida	1.0905	244	Carya tomentosa	0.8218	178	Bumelia tenax	0.7293
183	Mimusops Sieberi	1.0838	245	Carya porcina	0.8217	130	Cratægus cordata	0 7293
115	Cercocarpus ledifolius	1.0731	49	Colubrina reclinata	0.8208	228	Celtis occidentalis	0.7287
42	Reynosia latifolia	1.0715	106	Prunus umbellata	0.8202	293	Carpinus Caroliniana	0.7286
80	Olneya Tesota	1.0602	151	Cornus florida	0.8153	31	Swietenia Mahogoni	0.7282
30	Amyris sylvatica	1.0459	54	Sapindus marginatus	0.8126	228	Celtis occidentalis, *var.* reticulata	0.7275
162	Genipa clusiæfolia	1.0316	201	Osmanthus Americanus	0.8111	35	Ilex Cassine	0.7270
176	Sideroxylon Mastichodendron	1.0109	243	Carya sulcata	0.8108	225	Ulmus racemosa	0.7263
264	Quercus grisea	1.0092	78	Robinia viscosa	0.8094	222	Ulmus crassifolia	0.7245
141	Conocarpus erecta	0.9900	204	Bourreria Havanensis	0.8073	280	Quercus aquatica	0.7244
12	Canella alba	0.9893	259	Quercus Michauxii	0.8039	103	Prunus Americana	0.7215
83	Sophora secundiflora	0.9842	79	Robinia Neo-Mexicana	0.8034	126	Cratægus Crus-galli	0.7194
213	Coccoloba Floridana	0.9835	247	Carya myristicæformis	0.8016	196	Fraxinus quadrangulata	0.7184
113	Prunus ilicifolia	0.9803	284	Quercus hypoleuca	0.8009	241	Carya olivæformis	0.7180
214	Coccoloba uvifera	0.9635	182	Bumelia cuneata	0.7959	407	Thrinax argentea	0.7172
56	Hypelate paniculata	0.9533	128	Cratægus subvillosa	0.7953	170	Kalmia latifolia	0.7160
266	Quercus Durandii	0.9507	372	Pinus serotina	0.7942	132	Cratægus spathulata	0.7159
267	Quercus virens	0.9501	73	Rhus Metopium	0.7917	16	Fremontia Californica	0.7142
265	Quercus reticulata	0.9470	184	Diospyros Virginiana	0.7908	142	Laguncularia racemosa	0.7137
148	Eugenia procera	0.9453	189	Fraxinus Greggii	0.7904	338	Juniperus occidentalis, *var.* monosperma	0.7118
263	Quercus oblongifolia	0.9441	100	Prunus Capuli	0.7879	194	Fraxinus viridis	0.7117
97	Acacia Wrightii	0.9392	271	Quercus Wislizeni	0.7855	202	Cordia Sebestena	0.7108
116	Cercocarpus parvifolius	0.9365	137	Amelanchier Canadensis	0.7838	167	Arbutus Xalapensis	0.7099
144	Eugenia buxifolia	0.9360	135	Cratægus flava	0.7809	166	Arbutus Menziesii	0.7052
175	Chrysophyllum oliviforme	0.9300	41	Schœfferia frutescens	0.7745	117	Pyrus coronaria	0.7048
219	Drypetes crocea, *var.* latifolia	0.9346	294	Maclura aurantiaca	0.7736	274	Quercus tinctoria	0.7045
136	Heteromeles arbutifolia	0.9326	253	Morus microphylla	0.7715	380	Pinus palustris	0.6999
177	Dipholis salicifolia	0.9316	102	Chrysobalanus Icaco	0.7709	11	Capparis Jamaicensis	0.6971
160	Exostemma Caribæum	0.9310	122	Cratægus rivularis	0.7703	223	Ulmus fulva	0.6956
269	Quercus Emoryi	0.9263	216	Nectandra Willdenoviana	0.7693	110	Prunus demissa	0.6951
95	Leucæna glauca	0.9235	135	Cratægus flava, *var.* pubescens	0.7683	123	Cratægus Douglasii	0.6950
219	Drypetes crocea	0.9200	281	Quercus laurifolia	0.7673	174	Jacquinia armillaris	0.6948
32	Ximenia Americana	0.9196	258	Quercus bicolor	0.7662	279	Quercus palustris	0.6938
146	Eugenia monticola	0.9156	93	Prosopis juliflora	0.7652	85	Gymnocladus Canadensis	0.6934
211	Avicennia nitida	0.9138	192	Fraxinus Americana, *var.* Texensis	0.7636	277	Quercus falcata	0.6928
57	Hypelate trifoliata	0.9102	129	Cratægus tomentosa	0.7633	64	Acer saccharinum, *var.* nigrum	0.6915
272	Quercus rubra, *var.* Texana	0.9080	299	Betula lenta	0.7617	64	Acer saccharinum	0.6912
101	Pithecolobium Unguis-cati	0.9049	164	Vaccinium arboreum	0.7610	338	Juniperus occidentalis, *var.* conjugens	0.6907
40	Myginda pallens	0.9048	94	Prosopis pubescens	0.7609	63	Acer grandidentatum	0.6902
24	Xanthoxylum Caribæum	0.9002	246	Carya amara	0.7552	118	Pyrus angustifolia	0.6895
112	Prunus sphærocarpa	0.8998	285	Quercus imbricaria	0.7529	27	Canotia holocantha	0.6885
143	Calyptranthes Chytraculia	0.8992	92	Cercis reniformis	0.7513	104	Prunus angustifolia	0.6884
145	Eugenia dichotoma	0.8983	381	Pinus Cubensis	0.7504	291	Fagus ferruginea	0.6883
262	Quercus Douglasii	0.8928	168	Arbutus Texana	0.7500	138	Hamamelis Virginica	0.6856
75	Eysenhardtia orthocarpa	0.8740	165	Andromeda ferruginea	0.7500	282	Quercus heterophylla	0.6834
81	Piscidia Erythrina	0.8734	260	Quercus Prinus	0.7499	287	Quercus densiflora	0.6827
210	Citharexylum villosum	0.8710	226	Ulmus alata	0.7491	191	Fraxinus pistaciæfolia	0.6816
111	Prunus Caroliniana	0.8688	152	Cornus Nuttallii	0.7481	124	Cratægus brachyacantha	0.6793
127	Cratægus coccinea	0.8618	286	Quercus Phellos	0.7472	203	Cordia Boissieri	0.6790
261	Quercus prinoides	0.8605	251	Quercus alba	0.7470	37	Cyrilla racemiflora	0.6784
173	Ardisia Pickeringia	0.8602	181	Bumelia lycioides	0.7467	397	Abies bracteata	0.6783
98	Acacia Greggii	0.8550	169	Oxydendrum arboreum	0.7458	86	Gleditschia triacanthos	0.6740
84	Sophora affinis	0.8509	131	Cratægus apiifolia	0.7453	96	Leucaena pulverulenta	0.6732
268	Quercus chrysolepis	0.8493	253	Quercus Garryana	0.7449	250	Myrica Californica	0.6703
185	Diospyros Texana	0.8460	256	Quercus macrocarpa	0.7453	150	Cornus alternifolia	0.6696
255	Quercus undulata, *var.* Gambelii	0.8407	89	Parkinsonia microphylla	0.7453	400	Yucca canaliculata	0.6677
242	Carya alba	0.8372	25	Xanthoxylum Pterota	0.7444	61	Acer circinatum	0.6660
55	Sapindus Saponaria	0.8367	36	Ilex decidua	0.7420	180	Bumelia spinosa	0.6603
254	Quercus obtusiloba	0.8367	252	Quercus lobata	0.7409	199	Fraxinus anomala	0.6597
172	Myrsine Rapanea	0.8341	248	Carya aquatica	0.7407	39	Euonymus atropurpureus	0.6592

Catalogue number.	Species.	Relative specific gravity.	Catalogue number.	Species.	Relative specific gravity.	Catalogue number.	Species.	Relative specific gravity.
134	Cratægus æstivalis	0. 6564	187	Halesia diptera	0. 5705	379	Pinus Banksiana	0. 4761
240	Juglans rupestris	0. 6554	235	Platanus occidentalis	0. 5678	346	Torreya Californica	0. 4760
297	Betula lutea	0. 6553	353	Pinus Parryana	0. 5675	309	Salix lasiandra	0. 4756
179	Bumelia lanuginosa	0. 6544	47	Rhamnus Purshiana	0. 5672	231	Ficus pedunculata	0. 4739
192	Fraxinus Americana	0. 6543	356	Pinus monophylla	0. 5658	237	Platanus Wrightii	0. 4736
272	Quercus rubra	0. 6540	22	Xanthoxylum Americanum	0. 5654	14	Gordonia Lasianthus	0. 4728
88	Parkinsonia Torreyana	0. 6531	249	Myrica cerifera	0. 5637	361	Pinus ponderosa	0. 4715
212	Pisonia obtusata	0. 6529	188	Halesia tetraptera	0. 5628	400	Abies magnifica	0. 4701
218	Umbellularia Californica	0. 6517	316	Salix lasiolepis	0. 5587	3	Magnolia acuminata	0. 4690
354	Pinus cembroides	0. 6512	374	Pinus clausa	0. 5576	333	Cupressus Goveniana	0. 4689
224	Ulmus Americana	0. 6506	288	Castanopsis chrysophylla	0. 5574	304	Alnus serrulata	0. 4666
125	Cratægus arborescens	0. 6491	357	Pinus Balfouriana, *var.* aristata	0. 5572	319	Populus grandidentata	0. 4632
205	Ehretia elliptica	0. 6440	76	Dalea spinosa	0. 5536	325	Populus Fremontii, *var.* Wislizenii	0. 4621
275	Quercus Kelloggii	0. 6435	336	Juniperus Californica, *var.* Utahensis	0. 5522	331	Chamæcyparis Lawsoniana	0. 4621
215	Persea Carolinensis	0. 6429	45	Rhamnus Caroliniana	0. 5462	157	Sambucus Mexicana	0. 4614
69	Rhus cotinoides	0. 6425	66	Acer rubrum, *var.* Drummondii	0. 5459	153	Nyssa capitata	0. 4613
283	Quercus cinerea	0. 6420	363	Pinus Chihuahuana	0. 5457	305	Alnus incana	0. 4607
100	Lysiloma latisiliqua	0. 6418	120	Pyrus Americana	0. 5451	309	Salix lasiandra, *var.* Fendleriana	0. 4598
230	Ficus brevifolia	0. 6398	370	Pinus Tæda	0. 5441	382	Picea nigra	0. 4584
215	Persea Carolinensis, *var.* palustris	0. 6396	357	Pinus Balfouriana	0. 5434	368	Pinus insignis	0. 4574
343	Taxus brevifolia	0. 6391	313	Salix flavescens, *var.* Scouleriana	0. 5412	391	Pseudotsuga Douglasii, *var.* macrocarpa.	0. 4563
355	Pinus edulis	0. 6388	161	Pinckneya pubens	0. 5350			
200	Chionanthus Virginica	0. 6372	314	Salix Hookeriana	0. 5350	399	Abies nobilis	0. 4561
91	Cercis Canadensis	0. 6363	310	Salix longifolia, *var.* exigua	0. 5342	309	Salix lasiandra, *var.* lanceifolia	0. 4547
1	Magnolia grandiflora	0. 6360	59	Acer spicatum	0. 5330	340	Taxodium distichum	0. 4543
154	Nyssa sylvatica	0. 6356	186	Symplocos tinctoria	0. 5325	50	Æsculus glabra	0. 4542
199	Forestiera acuminata	0. 6345	5	Magnolia macrophylla	0. 5309	17	Tilia Americana	0. 4525
344	Taxus Floridana	0. 6340	373	Pinus inops	0. 5309	290	Castanea vulgaris, *var.* Americana	0. 4504
53	Ungnadia speciosa	0. 6332	58	Acer Pennsylvanicum	0. 5299	107	Prunus emarginata	0. 4502
209	Crescentia cucurbitina	0. 6319	227	Planera aquatica	0. 5294	307	Salix amygdaloides	0. 4502
198	Fraxinus sambucifolia	0. 6318	71	Rhus copallina	0. 5273	6	Magnolia Umbrella	0. 4487
171	Rhododendron maximum	0. 6303	65	Acer dasycarpum	0. 5260	206	Catalpa bignonioides	0. 4474
336	Juniperus Californica	0. 6282	362	Pinus Jeffreyi	0. 5206	411	Yucca elata	0. 4470
82	Cladrastis tinctoria	0. 6278	155	Nyssa uniflora	0. 5194	306	Salix nigra	0. 4456
332	Cupressus macrocarpa	0. 6261	71	Rhus copallina, *var.* lanceolata	0. 5184	390	Tsuga Pattoniana	0. 4454
193	Fraxinus pubescens	0. 6251	389	Tsuga Mertensiana	0. 5182	404	Sabal Palmetto	0. 4404
38	Cliftonia ligustrina	0. 6249	405	Washingtonia filifera	0. 5173	311	Salix sessilifolia	0. 4397
401	Larix Americana	0. 6236	391	Pseudotsuga Douglasii	0. 5157	72	Rhus venenata	0. 4382
66	Acer rubrum	0. 6178	371	Pinus rigida	0. 5151	350	Pinus flexilis	0. 4358
90	Parkinsonia aculeata	0. 6116	345	Torreya taxifolia	0. 5145	70	Rhus typhina	0. 4357
239	Juglans nigra	0. 6115	156	Sambucus glauca	0. 5087	67	Negundo aceroides	0. 4328
377	Pinus mitis	0. 6104	317	Salix Sitchensis	0. 5072	386	Picea Sitchensis	0. 4287
315	Salix cordata, *var.* vestita	0. 6069	23	Xanthoxylum Clava-Herculis	0. 5056	388	Tsuga Caroliniana	0. 4275
408	Oreodoxa regia	0. 6034	10	Anona laurifolia	0. 5053	51	Æsculus flava	0. 4274
296	Betula occidentalis	0. 6030	217	Sassafras officinale	0. 5042	312	Salix discolor	0. 4261
62	Acer glabrum	0. 6028	360	Pinus Arizonica	0. 5038	18	Tilia heterophylla	0. 4253
46	Rhamnus Californica	0. 6000	2	Magnolia glauca	0. 5035	387	Tsuga Canadensis	0. 4230
406	Thrinax parviflora	0. 5991	105	Prunus Pennsylvanica	0. 5023	8	Liriodendron Tulipifera	0. 4230
23	Xanthoxylum Clava-Herculis, *var.* fruticosum.	0. 5967	7	Magnolia Fraseri	0. 5003	398	Abies amabilis	0. 4228
			300	Alnus maritima	0. 4996	342	Sequoia sempervirens	0. 4208
295	Betula papyrifera	0. 5955	52	Æsculus Californica	0. 4980	207	Catalpa speciosa	0. 4165
121	Pyrus sambucifolia	0. 5928	313	Salix flavescens	0. 4969	351	Pinus albicaulis	0. 4165
139	Liquidambar Styraciflua	0. 5909	376	Pinus muricata	0. 4942	321	Populus balsamifera, *var.* candicans	0. 4161
208	Chilopsis saligna	0. 5902	375	Pinus pungens	0. 4935	4	Magnolia cordata	0. 4139
232	Morus rubra	0. 5898	310	Salix longifolia	0. 4930	28	Simaruba glauca	0. 4136
19	Byrsonima lucida	0. 5888	339	Juniperus Virginiana	0. 4926	367	Pinus Coulteri	0. 4133
289	Castanea pumila	0. 5887	325	Populus Fremontii	0. 4914	302	Alnus rhombifolia	0. 4127
34	Ilex Dahoon, *var.* myrtifolia	0. 5873	60	Acer macrophyllum	0. 4909	365	Pinus Murrayana	0. 4096
337	Juniperus pachyphlœa	0. 5829	236	Platanus racemosa	0. 4880	320	Populus heterophylla	0. 4089
108	Prunus serotina	0. 5822	359	Pinus Torreyana	0. 4879	238	Juglans cinerea	0. 4086
33	Ilex opaca	0. 5818	352	Pinus reflexa	0. 4877	17	Tilia Americana, *var.* pubescens	0. 4074
364	Pinus contorta	0. 5815	308	Salix lævigata	0. 4872	383	Picea alba	0. 4051
194	Fraxinus viridis, *var.* Berlandieriana	0. 5780	358	Pinus resinosa	0. 4854	318	Populus tremuloides	0. 4032
221	Hippomane Mancinella	0. 5772	335	Cupressus Guadalupensis	0. 4843	326	Libocedrus decurrens	0. 4017
338	Juniperus occidentalis	0. 5765	366	Pinus Sabiniana	0. 4840	303	Alnus oblongifolia	0. 3981
298	Betula nigra	0. 5762	68	Negundo Californicum	0. 4821	9	Asimina triloba	0. 3969
294	Betula alba, *var.* populifolia	0. 5760	301	Alnus rubra	0. 4813	378	Pinus glabra	0. 3931
48	Ceanothus thyrsiflorus	0. 5750	34	Ilex Dahoon	0. 4806	322	Populus angustifolia	0. 3912
197	Fraxinus Oregana	0. 5731	330	Chamæcyparis Nutkaensis	0. 4782	348	Pinus monticola	0. 3908

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324	Populus monilifera	0.3839	396	Abies concolor	0.3638	329	Chamæcyparis sphæroidea	0.3322
347	Pinus Strobus	0.3854	321	Populus balsamifera	0.3635	149	Cereus giganteus	0.3188
393	Abies balsamea	0.3819	392	Abies Fraseri	0.3565	327	Thuya occidentalis	0.3164
323	Populus trichocarpa	0.3814	395	Abies grandis	0.3545	29	Bursera gummifera	0.3003
328	Thuya gigantea	0.3796	195	Fraxinus platycarpa	0.3541	341	Sequoia gigantea	0.2882
385	Picea pungens	0.3740	369	Pinus tuberculata	0.3499	412	Yucca baccata	0.2724
410	Yucca brevifolia	0.3737	394	Abies subalpina	0.3476	229	Ficus aurea	0.2616
349	Pinus Lambertiana	0.3684	384	Picea Engelmanni	0.3449			

It will be noticed that all species in which the wood is heavier than water belong to the semi-tropical region of Florida or to the arid Mexican and interior Pacific regions. There seems to be a certain, but by no means constant relation, as shown in this table, between aridity of climate and the weight of the wood produced by closely allied species or by individuals of the same species. The wood of the form of *Quercus rubra* peculiar to western Texas is nearly 39 per cent. heavier than the average of all the specimens of the typical species grown in the northern states. Among the white oaks the wood of species belonging to regions of little rainfall, *Quercus grisea*, *oblongifolia*, *Durandii*, and *Douglasii*, is heavier than that of allied species peculiar to regions more favorable for the growth of trees. The average of two specimens of *Quercus prinoides* grown in western Texas is 19 per cent. heavier than the average of all the other specimens of this species grown in other parts of the country. In *Fraxinus*, the wood of *F. Greggii* of the Rio Grande valley is heavier than that of any other species; it only just surpasses in weight, however, the wood of the western Texas form of *F. Americana*, which is 20 per cent. heavier than the average of all specimens of the typical species grown north of Texas. On the other hand, the wood of Texas forms of *Fraxinus viridis* is constantly lighter than that of northern specimens, and the wood of *Celtis* grown in Arizona is lighter than that of the average of all the other specimens of this species. In *Juglans*, the heaviest wood is that of *J. rupestris*, a species belonging to a region of little rainfall, and a specimen of *J. nigra* from western Texas is 33 per cent. heavier than the average of all specimens grown in the Mississippi basin. In the case of *Platanus*, the heaviest wood is that of the Atlantic species, but wood of the species peculiar to the comparatively moist climate of southwestern Arizona is, however, considerably lighter than that of the drier climate of southern California.

FUEL VALUE.

The relative fuel values are obtained by deducting the percentage of ash from the specific gravity, and are based on the hypothesis that the real value of the combustible material in all woods is the same.

A number of analyses was also made of the wood of several of the principal trees of the United States (Table II) and their absolute fuel value calculated. Mr. Sharples describes the methods adopted by him to obtain these results, as follows:

The carbon and hydrogen determinations were made by the ordinary processes of organic analysis, by burning the wood in a current of oxygen. The moisture was determined by drying the wood at 100° centigrade until its weight became sensibly constant. The calculations were then made on the dry wood. The results contain a slight constant error, arising from the fact that the nitrogen in the wood was not determined. This error is, however, very slight, the nitrogen, which is included in the percentage of oxygen, rarely amounting, in any wood, to one per cent. The column headed "Hydrogen combined with oxygen", is found by dividing the amount in the column headed "Oxygen" by eight, and represents the hydrogen that may be considered as already combined with oxygen in the form of water, and is therefore useless for fuel. The fuel value per kilogram is found by multiplying the percentage of carbon by 8,080, and that of excess of hydrogen by 34,462 (these being the values obtained by *Favre* and *Silberman*), adding these together and deducting from the sum the product of the total hydrogen multiplied by 4,833, which represents the heat required to evaporate the water produced by burning the hydrogen. The constants used above represent the number of kilograms of water raised one degree centigrade, by burning one kilogram of carbon or hydrogen. The fuel value per cubic decimeter is found by multiplying the value per kilogram by the specific gravity. It need hardly be said that this fuel value is rarely attained in practice, and that it is never utilized. There are too many sources of loss; the calculation supposes that the combustion is perfect, that no smoke is given off, and that the heat of the products of combustion, with the exception of that necessary to convert the water into vapor, is all utilized.

It appears from Mr. Sharples' experiments that resinous woods give upward of 12 per cent. more heat from equal weights burned than non-resinous woods; the heat produced by burning a kilogram of dry non-resinous wood being about 4,000 units, while the heat produced by burning a kilogram of dry resinous wood is about 4,500 units, a unit being the quantity of heat required to raise 1 kilogram of water 1 degree centigrade.

Count Rumford first propounded the theory that the value of equal weights of wood for fuel was the same without reference to specific distinctions; that is, that a pound of wood, whatever the variety, would always produce the same amount of heat (*Count Rumford's Works*, Boston, 1873, vol. ii). Marcus Bull, experimenting in 1826 upon the fuel value of different woods (*Trans. Am. Phil. Soc.*, new ser., iii, 1), found a variation of only 11 per cent. between the different species tested. Rumford's theory must be regarded as nearly correct, if woods are

separated into resinous and non-resinous classes. The specific gravity gives a direct means of comparing heat values of equal volumes of wood of different resinous and non-resinous species. In burning wood, however, various circumstances affect its value; few fire-places are constructed to fully utilize the fuel value of resinous wood, and carbon escapes unconsumed in the form of smoke. Pine, therefore, which, although capable of yielding more heat than oak or hickory, may in practice yield considerably less, the pine losing both carbon and hydrogen in the form of smoke, while hickory or oak, burning with a smokeless flame, is practically entirely consumed. The ash in a wood, being non-combustible, influences its fuel value in proportion to its amount. The state of dryness of wood also has much influence upon its fuel value, though to a less degree than is generally supposed. The water in green wood prevents its rapid combustion, evaporation reducing the temperature below the point of ignition. Green wood may often contain as much as 50 per cent. of water, and this water must evaporate during combustion; but as half a kilogram of ordinary wood will give 2,000 units of heat, while half a kilogram of water requires only 268.5 units to evaporate it, 1731.5 units remain available for generating heat in wood containing even a maximum amount of water. In cases where the pressure was perpendicular to the grain of the wood it was applied on the side of the specimen nearest to the heart of the tree.

A factor in the general value of wood as fuel is the ease with which it can be seasoned; beech, for example, a very dense wood of high fuel value when dried, is generally considered of little value as fuel, on account of the rapidity with which it decays when cut and the consequent loss of carbon by decomposition.

THE STRENGTH OF WOOD.

The specimens tested for the purpose of determining the strength of the wood produced by the different trees of the United States were cut, with few exceptions, before March, 1881, and were slowly and carefully seasoned.

Those used in determining the resistance to transverse strain were made 4 centimeters square and long enough to give the necessary bearing upon the supports. These were shod with flat iron plates, slightly rounded on the edges and were set exactly 1 meter apart; they remained perfectly rigid under the pressure applied. Each specimen was weighed, measured, and its specific gravity calculated before it was tested. The result thus obtained represents the specific gravity of the air-dried wood.

To eliminate the action of their weight the specimens were placed upright, and hydraulic pressure was applied by means of an iron rod 12 millimeters in radius, acting midway between the supports, the deflections being read at this point.

The direction of the grain of the wood is shown by diagrams in the table (Table III), the pressure acting upon it horizontally from the left.

The pressure was applied slowly and uniformly, a reading of the deflections being taken for every 50 kilograms. When a load of 200 kilograms had been applied it was removed and the set read. Pressure was again applied in the same way, and the readings of deflections were resumed when 200 kilograms was again reached.

The formula used in calculating the coefficient of elasticity was $E = \frac{P\,l^3}{4 \triangle b d^3}$; l, b, d, being taken in millimeters; that of the modulus of rupture, $R = \frac{3\,P\,l}{2\,b\,d^2}$, l, b, d being in centimeters, P, in both formulas, in kilograms.

A few experiments were also made in the same manner, for purposes of comparison, to determine the transverse strength of specimens 1 meter long between the bearings and 8 centimeters square (Table IV).

The specimens tested by longitudinal compression were 4 centimeters square and 32 centimeters (8 diameters) long. They were placed between the platforms of the machine, and pressure was gradually applied until they failed. The figures given represent the number of kilograms required to cause failure.

The specimens tested under pressure applied perpendicularly to the fibers were 4 centimeters square and 16 centimeters long. They were placed upon the platform of the machine and indented with an iron punch 4 centimeters square on its face, covering the entire width of the specimen and one-quarter of its length at the center. In this series of experiments the direction of the annual rings was noted, horizontal pressure being also applied from the left. Readings were taken of the pressure necessary to produce each successive indentation of 0.254 up to 2.54 millimeters, and in the case of specimens which did not fail with this pressure a further test was made of the weight required to produce indentations of 3.81 and 5.08. The remarks (Table V) upon the behavior of the wood of the different species under compression were furnished by Mr. James E. Howard, in charge of the testing machine.

COMPARATIVE VALUES.

In the following table the number standing opposite each species represents its relative value in the column in which it appears.

This table is purely an arbitrary one, since the introduction of one or more species would of course change the value of all species standing lower in value, or results based on an examination of a larger number of specimens of any species may change the relative numbers in regard to it very considerably. In other words, any twenty or thirty species bearing consecutive numbers may change places with each other. This arises partly from the want of uniformity of the wood of any species, and partly from the fact that where so many determinations fall between comparatively narrow limits the mere order of sequence must be largely accidental.

TABLE OF RELATIVE VALUES.

Catalogue number.	Species.	Approximate fuel value.	Elasticity.	Ultimate transverse strength.	Ultimate resistance to longitudinal crushing.	Resistance to indentation to 1.27 millimeters.
	MAGNOLIACEÆ.					
1	Magnolia grandiflora	145	133	135	115	124
2	Magnolia glauca	205	127	163	173	234
3	Magnolia acuminata	230	122	201	189	226
4	Magnolia cordata	265	119	236	191	248
5	Magnolia macrophylla	189	41	184	104	247
6	Magnolia Umbrella	249	207	245	234	257
7	Magnolia Fraseri	207	114	179	182	202
8	Liriodendron Tulipifera	259	124	208	229	262
	ANONACEÆ.					
9	Asimina triloba	277	281	293	298	285
10	Anona laurifolia	220	278	234	277	198
	CANELLACEÆ.					
12	Canella alba	11	56	50	6	5
	TERNSTRŒMIACEÆ.					
14	Gordonia Lasianthus	228	187	201	214	240
	TILIACEÆ.					
17	Tilia Americana	246	161	241	240	290
17	Tilia Americana, *var.* pubescens	272	183	256	195	298
18	Tilia heterophylla	257	158	248	202	263
	MALPIGHIACEÆ.					
19	Byrsonima lucida	169	272	288	206	100
	ZYGOPHYLLACEÆ.					
20	Guaiacum sanctum	3	147	137	10	1
	RUTACEÆ.					
23	Xanthoxylum Clava-Herculis	204	217	219	148	165
24	Xanthoxylum Caribæum	27	143	150	15	18
	SIMARUBEÆ.					
28	Simaruba glauca	208	121	252	171	251
	BURSERACEÆ.					
29	Bursera gummifera	298	292	300	300	300
30	Amyris sylvatica	5	65	2	9	6
	MELIACEÆ.					
31	Swietenia Mahogoni	96	71	56	20	36
	ILICINEÆ.					
33	Ilex opaca	167	244	188	180	149
34	Ilex Dahoon	224	246	250	252	214
	CYRILLACEÆ.					
38	Cliftonia ligustrina	152	191	262	231	177
	RHAMNACEÆ.					
42	Reynosia latifolia	6	74	116	3	4
49	Condalia ferrea	1	45	85	5	3
45	Rhamnus Caroliniana	184	208	251	154	187
47	Rhamnus Purshiana	175	129	152	28	131
	SAPINDACEÆ.					
50	Æsculus glabra	245	243	271	278	282
52	Æsculus Californica	208	282	222	246	220
54	Sapindus marginatus	47	165	112	122	58
60	Acer macrophyllum	213	194	190	223	159
61	Acer circinatum	126	221	147	136	119
64	Acer saccharinum	117	9	18	30	73
64	Acer saccharinum, *var.* nigrum	118	88	68	57	66
65	Acer dasycarpum	192	59	53	113	145
66	Acer rubrum	154	117	121	133	151
67	Negundo aceroides	256	260	263	270	215
68	Negundo Californicum	221	113	132	155	221
	ANACARDIACEÆ.					
71	Rhus copallina	193	210	205	227	216
73	Rhus Metopium	59	74	208	73	109
	LEGUMINOSÆ.					
77	Robinia Pseudacacia	87	19	3	12	71
79	Robinia Neo-Mexicana	51	43	81	16	52
80	Olneya Tesota	7	143	153	235	2
81	Piscidia Erythrina	35	154	151	34	24
82	Cladrastris tinctoria	150	95	88	71	141
84	Sophora affinis	34	102	121	48	27
85	Gymnocladus Canadensis	114	77	144	200	163
86	Gleditschia triacanthos	124	64	77	93	156
87	Gleditschia monosperma	88	40	49	41	53
88	Parkinsonia Torreyana	134	264	259	184	90
91	Cercis Canadensis	146	228	165	123	142
93	Prosopis juliflora	69	259	273	40	26
94	Prosopis pubescens	67	172	91	18	28
	ROSACEÆ.					
103	Prunus Americana	97	161	103	89	104
104	Prunus angustifolia	119	253	276	107	190
107	Prunus emarginata	248	149	194	124	266
108	Prunus serotina	164	153	115	61	114
110	Prunus demissa	112	199	186	84	76
111	Prunus Caroliniana	29	120	76	50	32
113	Prunus ilicifolia	10	212	188	63	39
117	Pyrus coronaria	109	245	273	181	74
121	Pyrus sambucifolia	165	248	284	220	225
125	Cratægus arborescens	135	189	228	95	140
126	Cratægus Crus-galli	100	240	210	169	107
128	Cratægus subvillosa	52	135	102	68	63
129	Cratægus tomentosa	65	213	177	153	80
132	Cratægus spathulata	102	237	268	139	99
134	Cratægus æstivalis	128	256	176	152	94
135	Cratægus flava	61	225	167	76	31
137	Amelanchier Canadensis	57	34	24	19	48
	HAMAMELACEÆ.					
139	Liquidambar Styraciflua	162	167	214	128	192
	RHIZOPHORACEÆ.					
140	Rhizophora Mangle	2	2	10	2	8
	COMBRETACEÆ.					
141	Conocarpus erecta	9	89	72	32	19
142	Laguncularia racemosa	108	219	264	147	174
	MYRTACEÆ.					
144	Eugenia buxifolia	18	6	38	1	20
146	Eugenia monticola	24	65	15	55	12
148	Eugenia procera	19	38	14	17	9
	CORNACEÆ.					
151	Cornus florida	44	176	85	69	40
152	Cornus Nuttallii	74	85	60	22	77
153	Nyssa capitata	235	234	194	167	169
154	Nyssa sylvatica	141	178	112	125	127
155	Nyssa uniflora	195	275	210	237	161
	CAPRIFOLIACEÆ.					
156	Sambucus glauca	206	299	295	287	184
159	Viburnum prunifolium	38	131	69	37	35
	RUBIACEÆ.					
160	Exostemma Caribæum	15	36	55	8	7
161	Pinckneya pubens	187	231	201	289	230

TABLE OF RELATIVE VALUES—Continued.

Catalogue number.	Species.	Approximate fuel value.	Elasticity.	Ultimate transverse strength.	Ultimate resistance to longitudinal crushing.	Resistance to indentation to 1.27 millimeters.
	ERICACEÆ.					
165	Andromeda ferruginea	72	179	194	107	92
166	Arbutus Menziesii	107	164	81	89	110
167	Arbutus Xalapensis	104	251	230	198	75
169	Oxydendrum arboreum	78	137	164	90	95
170	Kalmia latifolia	101	258	219	168	65
171	Rhododendron maximum	148	242	205	156	133
	SAPOTACEÆ.					
175	Chrysophyllum oliviforme	17	54	107	33	15
176	Sideroxylon Mastichodendron	12	61	67	23	25
177	Dipholis salicifolia	16	16	18	11	49
178	Bumelia tenax	90	204	200	143	146
179	Bumelia lanuginosa	133	280	294	239	162
181	Bumelia lycioides	81	193	254	106	97
182	Bumelia cuneata	56	252	265	117	47
183	Mimusops Sieberi	4	95	79	135	16
	EBENACEÆ.					
184	Diospyros Virginiana	55	192	98	88	29
	STYRACACEÆ.					
186	Symplocos tinctoria	190	250	230	218	139
187	Halesia diptera	172	229	107	166	123
	OLEACEÆ.					
191	Fraxinus pistaciæfolia	122	254	226	217	108
192	Fraxinus Americana	130	91	106	121	153
192	Fraxinus Americana, *var.* Texensis	66	69	27	65	121
193	Fraxinus pubescens	151	182	101	162	113
194	Fraxinus viridis	105	133	91	114	98
195	Fraxinus platycarpa	291	283	261	296	185
196	Fraxinus quadrangulata	73	196	121	94	111
197	Fraxinus Oregana	171	156	203	80	157
198	Fraxinus sambucifolia	149	142	125	175	130
199	Forestiera acuminata	147	227	175	199	154
201	Osmanthus Americanus	45	28	40	51	64
	BORRAGINACEÆ.					
204	Bourreria Havanensis	53	97	71	45	43
205	Ehretia elliptica	142	296	169	215	87
	BIGNONIACEÆ.					
206	Catalpa bignonioides	250	233	241	238	273
207	Catalpa speciosa	263	175	224	194	254
208	Chilopsis sal'gna	161	267	247	278	181
	VERBENACEÆ.					
210	Citharexylum villosum	28	26	73	13	37
	NYCTAGINACEÆ.					
212	Pisonia obtusata	157	284	296	274	218
	POLYGONACEÆ.					
213	Coccoloba Floridana	14	49	78	7	13
	LAURACEÆ.					
215	Persea Carolinensis	138	162	88	47	128
215	Persea Carolinensis, *var.* palustris	140	162	116	232	132
217	Sassafras officinale	202	273	235	221	188
218	Umbellularia Californica	131	70	127	49	120
	EUPHORBIACEÆ.					
219	Drypetes crocea	30	79	132	24	23
219	Drypetes crocea, *var.* latifolia	25	168	178	79	13
	URTICACEÆ.					
222	Ulmus crassifolia	99	226	142	142	68
223	Ulmus fulva	111	110	101	66	172
224	Ulmus Americana	136	205	110	146	13
225	Ulmus racemosa	93	62	36	38	11
226	Ulmus alata	80	273	167	158	[illegible]
227	Planera aquatica	191	266	228	203	17
228	Celtis occidentalis	94	229	135	178	10
228	Celtis occidentalis, *var.* reticulata	98	143	127	160	[illegible]
229	Ficus aurea	300	300	298	299	20
231	Ficus pedunculata	244	292	299	284	20
232	Morus rubra	163	173	141	179	14
234	Maclura aurantiaca	63	114	25	4	2
	PLATANACEÆ.					
235	Platanus occidentalis	173	146	222	144	15
236	Platanus racemosa	218	249	254	269	24
237	Platanus Wrightii	231	286	285	267	21
	JUGLANDACEÆ.					
238	Juglans cinerea	270	181	238	205	24
239	Juglans nigra	155	63	109	46	12
240	Juglans rupestris	132	218	236	150	14
241	Carya olivæformis	103	230	246	164	8
242	Carya alba	36	12	11	27	6
243	Carya sulcata	46	78	33	52	4
244	Carya tomentosa	43	42	26	36	5
245	Carya porcina	42	92	31	43	4
246	Carya amara	71	86	30	78	7
247	Carya myristicæformis	49	8	1	25	3
248	Carya aquatica	86	93	96	110	5
	MYRICACEÆ.					
249	Myrica cerifera	177	137	110	151	18
250	Myrica Californica	125	99	46	74	13
	CUPULIFERÆ.					
251	Quercus alba	76	104	85	82	10
252	Quercus lobata	85	222	103	172	13
253	Quercus Garryana	70	183	99	97	7
254	Quercus obtusiloba	37	169	100	108	5
255	Quercus undulata, *var.* Gambelii	32	262	194	186	6
256	Quercus macrocarpa	82	122	65	103	8
257	Quercus lyrata	39	17	50	100	7
258	Quercus bicolor	60	131	81	102	6
259	Quercus Michauxii	48	106	28	112	8
260	Quercus Prinus	75	27	48	67	8
261	Quercus prinoides	31	53	6	44	6
262	Quercus Douglasii	26	197	57	53	1
263	Quercus oblongifolia	20	150	175	165	1
264	Quercus grisea	8	209	73	116	2
266	Quercus Durandii	21	105	57	70	3
267	Quercus virens	13	49	54	59	3
268	Quercus chrysolepis	33	33	4	62	3
269	Quercus Emoryi	22	247	180	176	1
270	Quercus agrifolia	41	110	75	131	8
271	Quercus Wislizeni	58	148	118	72	5
272	Quercus rubra	129	48	63	83	15
272	Quercus rubra, *var.* Texana	23	83	52	42	4
273	Quercus coccinea	84	65	38	87	11
274	Quercus tinctoria	106	81	44	92	11
275	Quercus Kelloggii	137	206	145	149	15
276	Quercus nigra	89	102	43	98	4
277	Quercus falcata	113	11	12	35	11
278	Quercus Catesbæi	91	80	42	137	8
279	Quercus palustris	115	55	32	101	13
280	Quercus aquatica	95	29	40	91	12
281	Quercus laurifolia	62	25	13	77	7

TABLE OF RELATIVE VALUES—Continued.

Catalogue number.	Species.	Approximate fuel value.	Elasticity.	Ultimate transverse strength.	Ultimate resistance to longitudinal crushing.	Resistance to indentation to 1.27 millimeters.
282	Quercus heterophylla	121	30	35	190	144
283	Quercus cinerea	144	203	57	150	118
284	Quercus hypoleuca	54	114	29	279	59
285	Quercus imbricaria	68	37	8	56	89
286	Quercus Phellos	77	190	63	211	102
287	Quercus densiflora	123	106	70	119	93
288	Castanopsis chrysophylla	180	94	158	163	206
289	Castanea pumila	160	46	60	99	209
290	Castanea vulgaris, *var.* Americana	247	152	184	222	227
291	Fagus ferruginea	120	32	18	120	125
292	Ostrya Virginica	40	15	23	64	85
293	Carpinus Caroliniana	92	43	18	96	103
	BETULACEÆ.					
294	Betula alba, *var.* populifolia	168	214	140	254	196
295	Betula papyrifera	159	18	37	109	195
296	Betula occidentalis	158	126	127	207	171
297	Betula lutea	127	3	5	29	160
298	Betula nigra	170	58	66	157	193
299	Betula lenta	64	10	9	31	91
301	Alnus rubra	222	72	121	188	210
302	Alnus rhombifolia	267	158	190	244	268
303	Alnus oblongifolia	276	199	189	285	279
	SALICACEÆ.					
307	Salix amygdaloides	251	277	257	291	264
308	Salix lævigata	216	280	217	272	208
309	Salix lasiandra, *var.* lancifolia	243	141	199	257	249
309	Salix lasiandra, *var.* Fendleriana	236	298	276	281	261
313	Salix flavescens	209	65	125	192	241
313	Salix flavescens, *var.* Scouleriana	186	22	81	126	199
316	Salix lasiolepis	181	137	120	216	183
318	Populus tremuloides	275	180	198	266	265
319	Populus grandidentata	234	108	169	243	295
320	Populus heterophylla	271	220	218	283	250
321	Populus balsamifera	288	150	257	271	276
321	Populus balsamifera, *var.* candicans	264	215	232	286	291
322	Populus angustifolia	260	284	292	299	274
323	Populus trichocarpa	285	57	204	209	293
324	Populus monilifera	281	98	145	249	258
325	Populus Fremontii	214	73	183	225	252
325	Populus Fremontii, *var.* Wislizeni	238	160	186	230	239
	CONIFERÆ.					
326	Libocedrus decurrens	274	157	190	130	242
327	Thuya occidentalis	297	271	267	275	297
328	Thuya gigantea	284	81	154	145	284
329	Chamæcyparis sphæroidea	296	294	281	294	287
330	Chamæcyparis Nutkaensis	223	87	130	138	236
331	Chamæcyparis Lawsoniana	233	31	93	129	259
333	Cupressus Goveniana	232	279	260	242	147
338	Juniperus occidentalis, *var.* conjugens	116	211	276	75	50
339	Juniperus Virginiana	212	238	158	177	176
340	Taxodium distichum	242	84	190	174	280
341	Sequoia gigantea	299	287	280	213	286
342	Sequoia sempervirens	261	236	238	187	271
343	Taxus brevifolia	139	202	34	111	62
345	Torreya taxifolia	198	170	94	134	166
346	Torreya Californica	227	294	243	250	203
347	Pinus Strobus	282	154	225	212	278
348	Pinus monticola	279	112	232	263	288
349	Pinus Lambertiana	287	187	238	262	270
350	Pinus flexilis	253	235	227	251	219
351	Pinus albicaulis	262	276	244	265	224
352	Pinus reflexa	215	127	143	105	290
353	Pinus Parryana	174	297	287	258	129
355	Pinus edulis	143	291	283	253	196
356	Pinus monophylla	176	289	297	288	155
357	Pinus Balfouriana	185	255	288	260	178
357	Pinus Balfouriana, *var.* aristata	179	223	210	208	189
358	Pinus resinosa	217	51	131	140	256
359	Pinus Torreyana	200	270	149	272	180
360	Pinus Arizonica	203	174	210	204	217
361	Pinus ponderosa	226	140	171	226	222
362	Pinus Jeffreyi	201	125	156	185	212
363	Pinus Chihuahuana	182	216	114	259	170
364	Pinus contorta	166	4	60	54	175
365	Pinus Murrayana	269	198	253	264	253
366	Pinus Sabiniana	219	257	139	261	186
367	Pinus Coulteri	266	46	148	233	246
368	Pinus insignis	239	101	158	183	229
369	Pinus tuberculata	293	290	290	293	255
370	Pinus Tæda	183	52	95	170	223
371	Pinus rigida	197	261	158	245	191
372	Pinus serotina	50	39	17	86	42
373	Pinus inops	188	269	207	241	168
374	Pinus clausa	178	268	269	228	194
375	Pinus pungens	211	186	166	247	219
376	Pinus muricata	210	35	47	85	204
377	Pinus mitis	156	18	45	118	197
378	Pinus glabra	278	288	270	280	228
379	Pinus Banksiana	225	118	214	201	237
380	Pinus palustris	110	7	18	26	167
381	Pinus Cubensis	70	5	15	21	137
382	Picea nigra	237	60	156	193	272
383	Picea alba	273	90	155	256	283
384	Picea Engelmanni	295	185	249	292	275
385	Picea pungens	286	265	281	295	267
386	Picea Sitchensis	254	100	216	248	281
387	Tsuga Canadensis	258	135	171	219	260
388	Tsuga Caroliniana	255	224	279	196	211
389	Tsuga Mertensiana	194	13	80	60	235
390	Tsuga Pattoniana	252	195	171	224	232
391	Pseudotsuga Douglasii	196	20	96	81	238
391	Pseudotsuga Douglasii, *var.* macrocarpa	240	74	111	132	233
392	Abies Fraseri	290	104	219	255	280
393	Abies balsamea	283	177	265	236	277
394	Abies subalpina	294	201	275	276	294
395	Abies grandis	292	109	271	268	299
396	Abies concolor	289	130	180	210	269
398	Abies amabilis	260	24	134	127	292
399	Abies nobilis	241	21	105	141	205
400	Abies magnifica	229	241	182	161	243
401	Larix Americana	153	23	90	58	231
402	Larix occidentalis	83	1	7	14	173
	PALMACEÆ.					
405	Washingtonia filifera	199	263	285	297	164

The following table gives the figures from which the table of relative values was computed, and includes all species upon which complete tests have been made.

The coefficient of elasticity is derived from the second deflection, the measurements being taken in millimeters and the weight in kilograms.

The ultimate transverse strength is the force, applied at the middle of the stick, required to break a stick 4 centimeters square and 1 meter between the supports.

In the compression tests the surface exposed to pressure was 4 centimeters square. To give the pressure on a square centimeter these results must be divided by 16.

The indentation to 1.27 millimeters, or the fifth in the series, is the one selected for comparison.

TABLE OF AVERAGES.

Catalogue number.	Species.	Approximate relative fuel value.	Coefficient of elasticity, kilograms on millimeters.	Ultimate transverse strength, in kilograms.	Ultimate resistance to longitudinal crushing, in kilograms.	Resistance to indentation to 1.27 millimeters, in kilograms.
	MAGNOLIACEÆ.					
1	Magnolia grandiflora	63.26	903	338	7,705	3,156
2	Magnolia glauca	50.11	914	313	6,790	1,627
3	Magnolia acuminata	46.76	929	286	6,633	1,709
4	Magnolia cordata	41.26	941	256	6,552	1,427
5	Magnolia macrophylla	52.90	1,169	297	7,829	1,427
6	Magnolia Umbrella	44.78	744	249	5,861	1,343
7	Magnolia Fraseri	49.89	944	302	6,691	1,966
8	Liriodendron Tulipifera	42.20	926	280	5,955	1,296
	ANONACEÆ.					
9	*Asimina triloba*	*39.61*	*482*	*167*	*3,395*	*1,098*
10	Anona laurifolia	48.11	501	259	4,829	2,037
	CANELLACEÆ.					
12	Canella alba	97.20	1,117	438	12,519	9,163
	TERNSTRŒMIACEÆ.					
14	Gordonia Lasianthus	46.92	794	286	6,195	1,591
	TILIACEÆ.					
17	Tilia Americana	45.00	840	252	5,768	1,044
17	Tilia Americana, *var.* pubescens	40.47	811	239	6,487	950
18	Tilia heterophylla	42.27	846	246	6,307	1,296
	MALPIGHIACEÆ.					
19	Byrsonima lucida	57.43	525	181	6,260	3,475
	ZYGOPHYLLACEÆ.					
20	Guaiacum sanctum	113.38	863	336	11,789	12,689
	RUTACEÆ.					
23	Xanthoxylum Clava-Herculis	50.15	726	273	7,189	2,548
24	Xanthoxylum Caribæum	88.20	868	322	10,955	5,964
	SIMARUBEÆ.					
28	Simaruba glauca	40.98	932	241	6,816	1,388
	BURSERACEÆ.					
29	Bursera gummifera	29.41	417	63	2,473	749
30	Amyris sylvatica	103.97	1,085	557	11,975	8,795
	MELIACEÆ.					
31	Swietenia Mahogoni	72.03	1062	428	10,660	4,951
	ILICINEÆ.					
33	Ilex opaca	57.74	643	293	6,709	2,826
34	Ilex Dahoon	47.62	642	244	5,582	1,808
	CYRILLACEÆ.					
38	Cliftonia ligustrina	62.23	783	225	5,938	2,356
	RHAMNACEÆ.					
42	Reynosia latifolia	103.72	1,050	350	13,426	9,753
43	Condalia ferrea	119.38	1,143	386	12,848	10,388
45	Rhamnus Caroliniana	54.27	741	242	7,112	2,195
47	Rhamnus Purshiana	56.34	913	320	9,994	3,075
	SAPINDACEÆ.					
50	Æsculus glabra	45.03	644	211	5,017	1,132
52	Æsculus Californica	40.45	683	271	5,686	1,722
54	Sapindus marginatus	80.05	837	360	7,523	4,350
60	Acer macrophyllum	48.83	780	292	6,100	2,597
61	Acer circinatum	66.34	718	327	7,349	3,205
64	Acer saccharinum	68.75	1,465	490	9,907	4,010
64	Acer saccharinum, *var.* nigrum	68.66	1,027	410	8,803	4,140
65	Acer dasycarpum	52.52	1,110	435	7,711	2,809
66	Acer rubrum	61.65	943	346	7,402	2,795
67	Negundo aceroides	42.82	582	226	5,151	1,781
68	Negundo Californicum	47.95	945	340	7,072	1,719
	ANACARDIACEÆ.					
71	Rhus copallina	52.42	736	223	6,033	1,744
73	Rhus Metopium	77.28	1,050	280	8,523	3,348
	LEGUMINOSÆ.					
77	Robinia Pseudacacia	72.96	1,301	543	11,272	4,038
79	Robinia Neo-Mexicana	79.86	1,149	388	10,031	4,427
80	Olneya Tesota	103.59	808	320	5,851	10,478
81	Piscidia Erythrina	84.39	851	321	9,548	5,608
82	Cladrastis tinctoria	62.61	1,002	385	8,550	2,937
84	Sophora affinis	84.46	977	346	9,129	5,348
85	Gymnocladus Canadensis	68.88	1,048	329	6,406	2,560
86	Gleditschia triacanthos	66.86	1,086	304	8,001	2,697
87	Gleditschia monosperma	72.89	1,170	439	9,344	4,420
88	Parkinsonia Torreyana	64.58	558	233	6,679	3,620
91	Cercis Canadensis	63.18	638	310	7,510	2,017
93	Prosopis juliflora	74.86	583	207	9,412	5,484
94	Prosopis pubescens	75.37	824	382	10,732	5,267
	ROSACEÆ.					
103	Prunus Americana	72.02	827	369	9,419	3,405
104	Prunus angustifolia	68.65	603	200	6,441	2,132
107	Prunus emarginata, *var.* mollis	44.93	861	290	7,507	1,280
108	Prunus serotina	58.14	852	354	8,746	3,269
110	Prunus demissa	69.16	769	295	8,165	3,937
111	Prunus Caroliniana	86.52	937	396	8,989	5,090
113	Prunus ilicifolia	97.27	732	334	8,709	4,888
117	Pyrus coronaria	70.11	642	207	6,706	3,999
121	Pyrus sambucifolia	*58.08*	*626*	*190*	*6,123*	*1,715*
125	Cratægus arborescens	64.55	788	265	7,969	2,951
126	Cratægus Crus-galli	71.54	664	270	6,884	3,368
128	Cratægus subvillosa	78.98	901	315	8,612	4,207
129	Cratægus tomentosa	75.96	732	303	7,117	3,844
132	Cratægus spathulata	71.12	673	216	7,280	3,484
134	Cratægus æstivalis	65.27	592	304	7,122	3,583
135	Cratægus flava, *var.* pubescens	76.13	708	309	8,497	5,103
137	Amelanchier Canadensis	77.95	1,197	483	10,712	4,483
	HAMAMELACEÆ.					
139	Liquidambar Styraciflua	58.78	837	278	7,462	2,122

TABLE OF AVERAGES—Continued.

Catalogue number.	Species.	Approximate relative fuel value.	Coefficient of elasticity, kilograms on millimeters.	Ultimate transverse strength, in kilograms.	Ultimate resistance to longitudinal crushing, in kilograms.	Resistance to indentation to 1.27 millimeters, in kilograms.
	RHIZOPHORACEÆ.					
140	Rhizophora Mangle	114.06	1,656	515	13,767	7,394
	COMBRETACEÆ.					
141	Conocarpus erecta	98.08	1,025	402	9,593	5,926
142	Laguncularia racemosa	70.21	724	221	7,190	2,386
	MYRTACEÆ.					
144	Eugenia buxifolia	92.20	1,575	450	14,108	5,851
146	Eugenia monticola	89.83	1,085	500	8,845	6,532
148	Eugenia procera	92.05	1,191	502	10,750	7,099
	CORNACEÆ.					
151	Cornus florida	80.98	821	386	8,553	4,875
152	Cornus Nuttallii	74.44	1,031	423	10,603	3,883
153	Nyssa capitata	45.97	681	290	6,895	2,484
154	Nyssa sylvatica	63.66	818	360	7,497	3,131
155	Nyssa uniflora	51.58	518	279	5,848	2,575
	CAPRIFOLIACEÆ.					
158	Sambucus glauca	50.07	305	158	4,400	2,218
159	Viburnum prunifolium	82.89	997	406	9,474	5,009
	RUBIACEÆ.					
160	Exostemma Caribæum	92.89	1,194	429	12,020	7,707
161	Pinckneya pubens	53.28	693	173	4,355	1,678
	ERICACEÆ.					
165	Andromeda ferruginea	74.66	814	290	7,802	3,611
166	Arbutus Menziesii	70.24	838	387	8,034	3,322
167	Arbutus Xalapensis	70.81	616	264	6,419	3,947
169	Oxydendrum arboreum	74.30	889	311	8,025	3,559
170	Kalmia latifolia	71.31	585	273	6,890	4,196
171	Rhododendron maximum	62.80	646	283	7,020	3,066
	SAPOTACEÆ.					
175	Chrysophyllum oliviforme	92.44	1,124	366	9,571	6,108
176	Sideroxylon Mastichodendron	95.89	1,099	414	10,410	5,682
177	Dipholis salicifolia	92.86	1,336	490	11,680	4,480
178	Bumelia tenax	72.39	751	257	7,235	2,894
179	Bumelia lanuginosa	64.64	483	165	5,799	2,564
181	Bumelia lycioides	74.07	781	240	7,825	3,529
182	Bumelia cuneata	78.08	603	220	7,643	4,581
183	Mimusops Sieberi	105.55	1,002	390	7,360	6,001
	EBENACEÆ.					
184	Diospyros Virginiana	78.32	782	375	8,045	5,192
	STYRACEÆ.					
186	Symplocos tinctoria	52.88	622	264	6,146	2,967
187	Halesia diptera	56.81	683	366	6,940	3,153
	OLEACEÆ.					
191	Fraxinus pistaciæfolia	67.68	601	266	6,158	3,368
192	Fraxinus Americana	65.16	1,015	367	7,535	2,745
192	Fraxinus Americana, *var.* Texensis	75.83	1,082	480	8,664	3,177
193	Fraxinus pubescens	62.35	812	371	6,960	3,272
194	Fraxinus viridis	70.71	903	382	7,711	3,521
195	Fraxinus platycarpa	35.16	476	229	4,014	2,209
196	Fraxinus quadrangulata	74.50	774	346	7,980	3,322
197	Fraxinus Oregana	57.12	848	284	8,320	2,653
198	Fraxinus sambucifolia	62.72	872	345	6,766	3,106
199	Forestiera acuminata	63.00	703	306	6,418	2,717
201	Osmanthus Americanus	80.74	1,231	449	8,966	4,206
	BORRAGINACEÆ.					
204	Bourreria Havanensis	78.48	996	403	9,197	4,702
205	Ehretia elliptica	63.56	397	308	6,192	3,663
	BIGNONIACEÆ.					
206	Catalpa bignonioides	44.57	682	252	5,921	1,230
207	Catalpa speciosa	41.48	822	270	6,521	1,377
208	Chilopsis saligna	58.79	544	247	4,753	2,304
	VERBENACEÆ.					
210	Citharexylum villosum	86.75	1,257	400	11,034	4,927
	NYCTAGINACEÆ.					
212	Pisonia obtusata	60.31	465	127	4,962	1,737
	POLYGONACEÆ.					
213	Coccoloba Floridana	93.40	1,136	392	12,337	6,310
	LAURACEÆ.					
215	Persea Carolinensis	63.81	839	385	9,173	3,128
215	Persea Carolinensis, *var.* palustris	63.73	849	350	5,874	3,073
217	Sassafras officinale	50.38	519	257	6,110	2,144
218	Umbellularia Californica	64.92	1,068	344	9,095	3,196
	EUPHORBIACEÆ.					
219	Drypetes crocea	86.44	1,039	340	10,410	5,797
219	Drypetes crocea, *var.* latifolia	88.65	836	302	8,324	6,510
	URTICACEÆ.					
222	Ulmus crassifolia	71.59	704	330	7,248	4,080
223	Ulmus fulva	69.77	953	371	8,628	2,399
224	Ulmus Americana	64.54	747	364	7,191	2,970
225	Ulmus racemosa	72.20	1,006	455	9,474	3,281
226	Ulmus alata	74.17	523	309	7,001	4,095
227	Planera aquatica	52.71	552	265	6,305	2,334
228	Celtis occidentalis	72.08	685	337	6,739	3,472
228	Celtis occidentalis, *var.* reticulata	71.86	868	344	6,985	4,373
229	Ficus aurea	24.84	257	102	2,597	980
231	Ficus pedunculata	45.07	407	98	4,491	1,905
232	Morus rubra	58.56	824	331	6,721	2,805
234	Maclura aurantiaca	76.01	944	483	12,939	5,806
	PLATANACEÆ.					
235	Platanus occidentalis	56.52	864	271	7,207	2,645
236	Platanus racemosa	48.26	624	240	5,190	1,486
237	Platanus Wrightii	46.72	457	183	5,228	1,867
	JUGLANDACEÆ.					
238	Juglans cinerea	40.66	812	255	6,270	1,488
239	Juglans nigra	60.91	1,092	365	9,178	3,140
240	Juglans rupestris	64.89	727	256	6,997	2,909
241	Carya olivæformis	70.99	666	247	6,951	3,714
242	Carya alba	83.11	1,390	512	10,007	4,344
243	Carya sulcata	80.35	1,039	464	8,939	4,609
244	Carya tomentosa	81.29	1,150	482	9,485	4,429
245	Carya porcina	81.36	1,014	466	9,232	4,822
246	Carya amara	74.74	1,030	470	8,357	3,878
247	Carya myristicæformis	79.31	1,465	595	10,206	5,042
248	Carya aquatica	73.13	1,013	376	7,776	4,397
	MYRICACEÆ.					
249	Myrica cerifera	56.08	888	348	7,122	2,304
250	Myrica Californica	66.81	992	442	8,516	3,017
	CUPULIFERÆ.					
251	Quercus alba	74.39	971	386	8,183	3,388
252	Quercus lobata	73.87	717	369	6,793	3,014
253	Quercus Garryana	74.24	811	375	7,957	3,846
254	Quercus obtusiloba	83.01	833	372	7,790	4,415
255	Quercus undulata, *var.* Gambelii	85.38	571	290	6,668	4,072
256	Quercus macrocarpa	74.06	929	419	7,843	3,730
257	Quercus lyrata	82.59	1,334	438	7,864	4,033
258	Quercus bicolor	76.18	906	388	7,850	3,534

TABLE OF AVERAGES—Continued.

Catalogue number.	Species.	Approximate relative fuel value.	Coefficient of elasticity, kilograms on millimeters.	Ultimate transverse strength, in kilograms.	Ultimate resistance to longitudinal crushing, in kilograms.	Resistance to indentation to 1.27 millimeters, in kilograms.
259	Quercus Michauxii	80.03	964	477	7,715	3,725
260	Quercus Prinus	74.42	1,255	440	8,615	3,686
261	Quercus prinoides	86.00	1,125	528	9,204	4,224
262	Quercus Douglasii	88.53	771	424	8,913	5,988
263	Quercus oblongifolia	97.60	857	307	6,941	7,031
264	Quercus grisea	99.10	740	400	7,666	5,829
266	Quercus Durandii	91.00	837	424	8,550	4,922
267	Quercus virens	93.93	1,130	434	8,748	5,185
268	Quercus chrysolepis	84.43	1,198	541	8,721	5,079
269	Quercus Emoryi	90.44	638	300	6,759	6,646
270	Quercus agrifolia	81.47	953	399	7,416	3,770
271	Quercus Wislizeni	77.75	861	349	8,527	4,362
272	Quercus rubra	65.28	1,137	422	8,172	2,825
273	Quercus rubra, *var.* Texana	90.03	1,033	437	9,310	4,665
273	Quercus coccinea	73.91	1,085	450	8,074	3,224
274	Quercus tinctoria	70.10	1,034	444	8,012	3,243
275	Quercus Kelloggii	64.18	745	328	7,184	2,783
276	Quercus nigra	72.39	977	445	7,954	4,582
277	Quercus falcata	69.11	1,402	509	9,532	3,223
278	Quercus Catesbæi	72.31	1,035	447	7,316	3,646
279	Quercus palustris	68.82	1,123	465	7,862	3,040
280	Quercus aquatica	72.07	1,227	449	8,023	3,169
281	Quercus laurifolia	76.10	1,259	504	8,424	4,056
282	Quercus heterophylla	68.22	1,225	458	6,600	2,908
283	Quercus cinerea	63.47	751	424	7,167	3,221
284	Quercus hypoleuca	78.41	944	475	4,695	4,348
285	Quercus imbricaria	74.97	1,193	520	8,839	3,623
286	Quercus Phellos	74.35	784	422	6,236	3,452
287	Quercus densiflora	67.25	964	404	7,609	3,593
288	Castanopsis chrysophylla	55.55	1,012	316	6,959	1,912
289	Castanea pumila	58.80	1,141	423	7,923	1,887
290	Castanea vulgaris, *var.* Americana	44.05	856	297	6,106	1,698
291	Fagus ferruginea	68.48	1,210	490	7,550	3,145
292	Ostrya Virginica	82.42	1,373	484	8,669	3,696
293	Carpinus Carolinana	72.26	1,149	490	7,969	3,405
	BETULACEÆ.					
294	Betula alba, *var.* populifolia	57.43	730	332	5,564	2,073
295	Betula papyrifera	59.40	1,306	454	7,781	2,088
296	Betula occidentalis	60.12	924	344	6,260	2,459
297	Betula lutea	65.34	1,618	533	9,907	2,581
298	Betula nigra	57.42	1,113	415	7,007	2,117
299	Betula lenta	75.97	1,432	519	9,907	3,615
301	Alnus rubra	47.93	1,060	346	6,644	1,870
302	Alnus rhombifolia	41.14	840	291	5,696	1,257
303	Alnus oblongifolia	39.65	769	293	4,452	1,189
	SALICACEÆ.					
307	Salix amygdaloides	44.68	501	235	4,224	1,294
308	Salix lævigata	48.44	488	275	5,114	1,894
309	Salix lasiandra, *var.* lancifolia	45.73	305	200	4,581	1,311
309	Salix lasiandra, *var.* Fendleriana	45.12	879	288	5,457	1,400
313	Salix flavescens	58.91	1,262	388	7,484	2,019
313	Salix flavescens, *var.* Scouleriana	49.39	1,085	345	6,532	1,581
316	Salix lasiolepis	55.32	888	347	6,169	2,241
318	Populus tremuloides	40.10	814	289	5,285	1,281
319	Populus grandidentata	40.11	963	308	5,727	994
320	Populus heterophylla	40.57	723	274	4,527	1,384
321	Populus balsamifera	36.11	857	235	5,126	1,202
321	Populus balsamifera, *var.* candicans.	41.42	730	260	4,418	1,030
322	Populus angustifolia	38.81	458	171	4,332	1,225
323	Populus trichocarpa	37.66	1,117	284	6,248	1,018
324	Populus monilifera	38.53	994	328	5,651	1,927
325	Populus Fremontii	48.77	1,051	298	6,055	1,382
325	Populus Fremontii, *var.* Wislizeni	45.09	843	295	5,950	1,607
	CONIFERÆ.					
326	Libocedrus decurrens	40.14	847	291	7,446	1,561
327	Thuya occidentalis	31.53	533	219	4,903	957
328	Thuya gigantea	37.90	1,034	319	7,197	1,114
329	Chamæcyparis sphæroidea	33.12	404	194	4,149	1,074
330	Chamæcyparis Nutkaensis	47.66	1,029	342	7,281	1,618
331	Chamæcyparis Lawsoniana	46.16	1,217	370	7,454	1,317
333	Cupressus Goveniana	46.68	499	230	5,742	2,852
338	Juniperus occidentalis, *var.* conjugens.	68.75	734	200	8,505	4,464
339	Juniperus Virginiana	49.11	670	316	6,750	2,376
340	Taxodium distichum	45.24	1,032	291	6,771	1,166
341	Sequoia gigantea	28.67	451	196	6,210	1,091
342	Sequoia sempervirens	42.02	676	255	6,656	1,242
343	Taxus brevifolia	63.78	761	460	7,734	4,223
345	Torreya taxifolia	51.08	821	378	7,364	2,523
346	Torreya Californica	46.96	401	249	5,625	1,962
347	Pinus Strobus	38.47	851	267	6,219	1,194
348	Pinus monticola	38.99	950	260	5,349	1,071
349	Pinus Lambertiana	36.76	794	255	5,382	1,244
350	Pinus flexilis	43.42	676	266	5,501	1,727
351	Pinus albicaulis	41.54	512	249	5,296	1,716
352	Pinus reflexa	48.65	913	329	7,825	2,002
353	Pinus Parryana	56.44	378	182	5,420	3,126
355	Pinus edulis	63.49	421	191	5,579	3,888
356	Pinus monophylla	56.20	435	123	4,389	2,718
357	Pinus Balfouriana	54.17	594	181	5,398	2,350
357	Pinus Balfouriana, *var.* aristata	55.56	715	279	5,209	2,140
358	Pinus resinosa	48.41	1,132	341	7,274	1,853
359	Pinus Torreyana	50.62	542	323	4,518	2,309
360	Pinus Arizonica	50.28	824	279	6,202	1,740
361	Pinus ponderosa	46.99	887	307	6,037	1,719
362	Pinus Jeffreyi	50.53	925	318	6,679	1,850
363	Pinus Chihuahuana	54.37	726	355	5,398	2,470
364	Pinus contorta	58.04	1,585	423	8,868	2,382
365	Pinus Murrayana	40.83	771	241	5,328	1,379
366	Pinus Sabiniana	48.18	585	333	5,987	2,202
367	Pinus Coulteri	41.18	1,141	325	5,874	1,475
368	Pinus insignis	45.60	979	316	6,680	1,687
369	Pinus tuberculata	34.88	429	175	4,207	1,372
370	Pinus Tæda	54.27	1,128	377	6,834	1,719
371	Pinus rigida	51.39	581	316	5,687	2,123
372	Pinus serotina	70.29	1,170	497	8,079	4,740
373	Pinus inops	52.93	543	281	5,765	2,406
374	Pinus clausa	55.09	543	214	6,028	2,100
375	Pinus pungens	49.22	803	310	5,670	1,842
376	Pinus muricata	49.29	1,194	441	8,142	1,950
377	Pinus mitis	60.86	1,375	443	7,628	2,064
378	Pinus glabra	39.13	448	212	4,604	1,694
379	Pinus Banksiana	47.50	942	278	6,329	1,609
380	Pinus palustris	69.82	1,488	400	10,074	2,508
381	Pinus Cubensis	74.83	1,577	500	10,626	2,985
382	Picea nigra	45.71	1,100	318	6,520	1,240
383	Picea alba	40.38	1,023	319	5,489	1,117
384	Picea Engelmanni	33.38	808	245	4,271	1,217
385	Picea pungens	37.26	553	194	4,128	1,267
386	Picea Sitchensis	42.80	990	277	5,053	1,166
387	Tsuga Canadensis	42.20	900	307	6,142	1,314
388	Tsuga Caroliniana	42.58	713	197	6,450	1,996
389	Tsuga Mertensiana	51.61	1,375	388	8,747	1,622

TABLE OF AVERAGES—Continued.

Catalogue number.	Species.	Approximate relative fuel value.	Coefficient of elasticity, kilograms on millimeters.	Ultimate transverse strength in kilograms.	Ultimate resistance to longitudinal crushing, in kilograms.	Resistance to indentation to 1.27 millimeters in kilograms.	Catalogue number.	Species.	Approximate relative fuel value.	Coefficient of elasticity, kilograms on millimeters.	Ultimate transverse strength in kilograms.	Ultimate resistance to longitudinal crushing in kilograms.	Resistance to indentation to 1.27 millimeters in kilograms.
390	Tsuga Pattoniana	44.35	775	307	6,074	1,064	398	Abies amabilis	42.18	1260	338	7,480	1,029
391	Pseudotsuga Douglasii	51.53	1283	376	8,289	1,608	399	Abies nobilis	45.46	1277	368	7,256	1,917
391	Pseudotsuga Douglasii, *var.* macrocarpa.	45.59	1050	361	7,405	1,642	400	Abies magnifica	46.87	662	299	6,963	1,545
							401	Larix Americana	62.16	1261	384	8,763	1,675
392	Abies Fraseri	35.46	972	273	5,557	1,048	402	Larix *occidentalis*	*74.00*	*1658*	*524*	*11,023*	*2,395*
393	Abies balsamea	38.02	819	220	5,851	1,202							
394	Abies subalpina	34.61	762	202	4,829	1,015		PALMACEÆ.					
395	Abies grandis	35.08	958	211	6,255	810							
396	Abies concolor	36.07	909	300	6,237	1,248	405	Washingtonia filifera	50.75	563	183	3,633	2,550

The following table illustrates the relation between the specific gravity and the transverse strength of the wood of species upon which a sufficient number of tests has been made to render such a comparison valuable. The determinations of the specific gravity and transverse strength were, in every case, made upon the same specimen, at the same time. The table is arranged according to the specific gravity of the specimens.

It will be noticed that the strength of the different specimens closely but not invariably follows their specific gravity. An examination of Table III will show, however, that in nearly every case where any wide difference occurs it is due to imperfections in the stick disproportionately affecting its strength. Moreover, in the case of species where the specific gravity and strength of different specimens are nearly identical, their order of arrangement becomes largely accidental. A slight difference in the time occupied in the strength tests, or slight variations in the direction of the grain of the wood, may considerably affect the sequence in such a table:

TABLE ILLUSTRATING THE RELATION BETWEEN TRANSVERSE STRENGTH AND *SPECIFIC GRAVITY IN THE WOOD* OF CERTAIN SPECIES.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.	Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
3	Magnolia acuminata	534	1	1	66	Acer rubrum	20	1	8
		534	2	2			878	2	3
		246	3	3			878	3	1
		261	4	5			1048	4	2
		246	5	4			1048	5	4
		261	6	6			530	6	5
8	Liriodendron Tulipfera	818	1	1			530	7	6
		818	2	5			743	8	9
		1231	3	2			743	9	7
		1236	4	6	77	Robinia Pseudacacia	1248	1	1
		1236	5	4			40[illegible]	2	2
		1232	6	3			1248	3	5
		1232	7	8			1247	4	3
		395	8	7			1247	5	4
60	Acer macrophyllum	982	1	1			815	6	6
		982	2	2			815	7	7
		1023	3	4	108	Prunus serotina	15	1	1
		1023	4	3			15	2	2
64	Acer saccharinum	299	1	2			127	3	4
		1233	2	1			1053	4	5
		1235	3	7			1053	5	6
		1234	4	6			127	6	3
		1235	5	5			763	7	8
		1234	6	4			763	8	7
		1233	7	3			368	9	9
		376	8	8			317	10	10
		409	9	9			317	11	11
64	Acer saccharinum, *var.* nigrum	274	1	1			1151	12	13
		213	2	2			406	13	12
		757	3	3	117	Pyrus coronaria	1088	1	1
		757	4	4			7108	2	3

RELATION BETWEEN TRANSVERSE STRENGTH AND SPECIFIC GRAVITY, ETC.—Continued.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
117	Pyrus coronaria—continued	1088	3	2
		1087	4	4
189	Liquidambar Styraciflua	1173	1	2
		1182	2	9
		1182	3	5
		1183	4	8
		1173	5	1
		1095	6	3
		1181	7	11
		1181	*8*	*10*
		546	9	6
		1095	10	4
		546	11	12
		1183	12	7
151	Cornus florida	1077	3	1
		1077	4	3
		1092	5	8
		812	6	4
		812	7	5
		761	8	7
		67	9	6
		67	10	4
154	Nyssa sylvatica	750	1	2
		835	2	9
		750	3	1
		833	4	6
		833	5	4
		834	6	7
		834	7	3
		813	8	5
		813	9	8
155	Nyssa uniflora	128	1	2
		128	2	1
		604	3	6
		604	4	4
		559	5	5
		550	6	3
184	Diospyros Virginiana	425	1	1
		1084	2	6
		1162	3	4
		811	4	3
		1084	5	2
		811	6	5
		61	7	8
		61	8	7
102	Fraxinus Americana	1045	1	1
		1045	2	4
		114[3]	3	3
		937	4	19
		227[2]	5	2
		130	6	7
		431	7	6
		114[4]	8	5
		227[1]	9	10
		39[2]	10	8
		212	11	11
		212	12	9
		747	13	21
		551	14	14
		227	15	13
		267	16	12
		747	17	17
		551	18	15
		114[5]	19	16
		114	20	18
		114	21	20
194	Fraxinus viridis	949	1	2
194	Fraxinus viridis—continued	948	2	4
		957	3	1
		438	4	3
		57	5	7
		957	6	5
		308	7	6
		308	8	8
196	Fraxinus quadrangulata	66	1	3
		66	2	2
		286[1]	3	1
		518	4	5
		286[2]	5	6
		291	6	4
		125	7	8
		125	8	7
217	Sassafras officinale	814	1	6
		814	2	4
		71	3	1
		854	4	7
		854	5	8
		446	6	5
		387	7	3
		71	8	2
		387	9	9
223	Ulmus fulva	134	1	1
		134	2	2
224	Ulmus Americana	533	1	6
		533	2	4
		1049	3	2
		19	4	1
		19	5	3
		1036	6	11
		1036	7	10
		958	8	7
		281	9	8
		281	10	9
		958	11	5
225	Ulmus racemosa	110	1	1
		314	2	2
		314	3	5
		110[5]	4	3
		428	5	7
		110[3]	6	4
		110	7	6
228	Celtis occidentalis	873	1	5
		873	2	4
		1111	3	1
		306	4	6
		306	5	7
		1111	6	2
		75	7	3
		75	8	8
232	Morus rubra	132	1	1
		1255	2	4
		132	3	2
		1255	4	6
		1244	5	3
		1245	6	5
		1246	7	7
238	Juglans cinerea	1057	1	1
		76[2]	2	2
		16	3	7
		16	4	4
		76	5	5
		76	6	3
		123	7	6
		393	8	8

RELATION BETWEEN TRANSVERSE STRENGTH AND SPECIFIC GRAVITY, ETC.—Continued.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
239	Juglans nigra	951	1	4
		951	2	3
		766	3	1
		766	4	6
		318	5	9
		325	6	8
		407	7	5
		117	8	2
		117	9	7
242	Carya alba	29[2]	1	4
		539	2	7
		531	3	2
		531	4	3
		1056	5	12
		1056	6	13
		3	7	6
		1097	8	1
		249	9	11
		118	10	14
		249	11	10
		118	12	16
		3	13	5
		816	14	9
		539	15	8
		816	16	15
243	Carya sulcata	383	1	3
		1082	2	5
		391	3	1
		1166	4	6
		391	5	4
		1082	6	7
		1164	7	2
		1170	8	8
		1165	9	9
245	Carya porcina	88	1	1
		88	2	2
		1168	3	7
		1168	4	4
		442	5	9
		538	6	3
		6	7	5
		6	8	6
		121	9	8
248	Carya aquatica	740	1	1
		740	2	5
		362	3	3
		362	4	4
		129	5	2
		917	6	6
251	Quercus alba	1257	1	18
		749	2	27
		547	3	1
		547	4	11
		1257	5	14
		8	6	19
		1050	7	10
		749	8	8
		259	9	9
		238	10	5
		748	11	3
		32	12	12
		1050	13	2
		49	14	13
		250	15	7
		895	16	29
		238	17	6
		250	18	16
251	Quercus alba—continued	49[1]	19	15
		259[3]	20	21
		49[3]	21	17
		49[2]	22	24
		8	23	25
		403	24	28
		895	25	29
		251	26	4
		113[2]	27	31
		403	28	33
		251	29	26
		32[2]	30	20
		113[3]	31	34
		49	32	22
		443	33	35
		32[3]	34	22
		113	35	31
253	Quercus Garryana	985	1	1
		1027	2	6
		985	3	3
		988	4	2
		1027	5	7
		1029	6	4
		988	7	5
		1029	8	8
254	Quercus obtusiloba	771	1	5
		771	2	7
		256	3	3
		151	4	1
		151	5	2
		351	6	4
		351	7	4
256	Quercus macrocarpa	137	1	1
		310	2	8
		1071	3	5
		310	4	10
		143	5	13
		933	6	12
		1073	7	6
		1072	8	7
		933	9	11
		79	10	3
		432	11	9
		831	12	4
		79	13	2
257	Quercus lyrata	545	1	1
		762	2	2
		762	3	3
		545	4	4
258	Quercus bicolor	54	1	1
		846	2	5
		846	3	4
		54[2]	4	2
		54	5	3
259	Quercus Michauxii	755	1	8
		755	2	1
		240	3	5
		240	4	6
		524	5	4
		524	6	2
260	Quercus Prinus	35	1	1
		925	2	3
		31	3	5
		925	4	4
		31	5	2
		434	6	6
261	Quercus prinoides	273	1	2
		287	2	4

RELATION BETWEEN TRANSVERSE STRENGTH AND SPECIFIC GRAVITY, ETC.—Continued.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
261	Quercus prinoides—continued	514	3	3
		34[2]	4	1
		514	5	6
		34	6	5
267	Quercus virens	404	1	3
		954	2	7
		954	3	6
		799	4	2
		919	5	4
		799	6	1
		919	7	5
272	Quercus rubra	1043	1	1
		146	2	10
		1043	3	4
		217	4	6
		215	5	7
		218	6	3
		7	7	2
		7	8	5
		149	9	8
		215	10	11
		92	11	13
		45[2]	12	9
		141	13	15
		920	14	6
		920	15	7
		45[1]	16	12
		45[2]	17	14
274	Quercus tinctoria	74	1	4
		36[3]	2	9
		36[2]	3	2
		36	4	6
		36	5	8
		247	6	1
		17	7	5
		247	8	3
		437	9	10
		17	10	7
		244	11	11
		444	12	12
277	Quercus falcata	548	1	6
		265	2	1
		548	3	2
		131	4	5
		131	5	7
		265	6	4
		245	7	6
		245	8	8
280	Quercus aquatica	742	1	1
		511	2	8
		742	3	9
		511	4	2
		349	5	4
		349	6	3
		264[1]	7	6
		264[2]	8	5
		264[3]	9	7
290	Castanea vulgaris, *var.* Americana	18	1	2
		258	2	1
		516	3	3
		18	4	4
291	Fagus ferruginea	119	1	2
		9	2	1
		853	3	4
		9	4	3
		853	5	6
		119	6	5
291	Fagus ferruginea—continued	765	7	9
		765	8	7
		443	9	10
		44[2]	10	8
295	Betula papyrifera	836	1	1
		1065	2	2
		1065	3	4
		1067	4	3
		722	5	5
		990	6	9
		1066	7	6
		1066	8	7
		990	9	11
		1067	10	10
		722	11	8
297	Betula lutea	843	1	2
		843	2	8
		1068	4	7
		1069	5	6
		1070	3	4
		1068	6	5
		1069	7	1
		1070	8	3
298	Betula nigra	842	1	5
		841	2	4
		841	3	2
		842	4	6
		136	5	1
		136	6	3
301	Alnus rubra	991	1	4
		991	2	3
		1025	3	1
		967	4	5
		967	5	6
		1025	6	2
324	Populus monilifera	309	1	3
		754	2	2
		754	3	1
		309	1	3
		304	5	5
		304	6	6
325	Populus Fremontii, *var.* Wislizeni	912	1	5
		646	2	2
		646	3	4
		909	4	1
		912	5	6
		909	6	3
327	Thuya occidentalis	1099	1	2
		874	2	1
		874	3	5
		782	4	7
		1099	5	3
		783	6	8
		783	7	10
		790	8	4
		790	9	6
		879	10	9
		879	11	11
		792	12	12
		793	13	13
329	Chamæcyparis sphæroidea	850	1	7
		850	2	3
		850	3	1
		851	4	4
		851	5	2
		852	6	5
		850	7	6

RELATION BETWEEN TRANSVERSE STRENGTH AND SPECIFIC GRAVITY, ETC.—Continued.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
330	Chamæcyparis Nutkaensis	969	1	5
		983	2	1
		1000	3	8
		983	4	3
		1000	5	6
		994	6	4
		994	7	2
		969	8	7
339	Juniperus Virginiana	1240	1	5
		1250	2	7
		734	3	1
		800	4	4
		800	5	3
		327	6	2
		327	7	6
342	Sequoia sempervirens	711	1	5
		710	2	1
		711	3	3
		713	4	6
		713	5	2
		712	6	4
		712	7	7
347	Pinus Strobus	222	1	2
		1044	2	7
		797	3	1
		1	4	4
		788	5	3
		788	6	5
		797	7	6
		1044	8	11
		789	9	8
		789	10	9
		777	11	10
358	Pinus resinosa	315	1	1
		315	2	2
		1076	3	3
		1076	4	5
		785	5	4
		1074	6	6
		1075	7	7
		785	8	8
361	Pinus ponderosa	632	1	3
		910	2	10
		907	3	11
		689	4	1
		619	5	4
		630	6	9
		731	7	6
		626	8	2
		718	9	5
		630	10	12
		718	11	8
		636	12	7
370	Pinus Tæda	82	1	1
		355	2	4
		355	3	6
		388	4	2
		389	5	3
		388	6	7
		389	7	5
373	Pinus inops	1172	1	4
		1172	2	2
		1169	3	6
		1169	4	1
		622	5	5
		621	6	3
378	Pinus glabra	764	1	1
378	Pinus glabra—continued	764	2	2
		142	3	4
		142	4	3
		544	5	6
		514	6	5
379	Pinus Banksiana	780	1	1
		879	2	2
		394	3	3
		394	4	4
		879	5	6
		780	6	5
380	Pinus palustris	81	1	1
		358	2	7
		559	3	2
		358	4	3
		357	5	1
		81	6	10
		359	7	11
		360	8	4
		361	9	8
		361	10	5
		360	11	13
		243	12	9
		243	13	6
		385	14	18
		390	15	15
		357	16	12
		85	17	10
		384	18	16
		390	19	17
		85	20	20
		384	21	21
381	Pinus Cubensis	493	1	6
		493	2	4
		356	3	2
		356	4	1
		84	5	3
		84	6	5
382	Picea nigra	231	1	1
		231	2	2
		776	3	3
		880	4	4
		776	5	9
		373	6	7
		880	7	8
		794	8	5
		794	9	6
383	Picea alba	513	1	6
		773	2	3
		773	3	1
		784	4	5
		513	5	4
		784	6	8
		791	7	2
386	Picea Sitchensis	970	1	3
		970	2	2
		1015	3	1
		977	4	4
		1026	5	8
		977	6	5
		1026	7	9
		1019	8	6
		1019	9	7
387	Tsuga Canadensis	793	1	6
		793	2	2
		772	3	1
		772	4	3

RELATION BETWEEN TRANSVERSE STRENGTH AND SPECIFIC GRAVITY, ETC.—Continued.

Catalogue number.	Species.	Office number.	Relative specific gravity.	Relative transverse strength.
387	Tsuga Canadensis—continued	1040	5	4
		1040	6	5
		775	7	13
		787	8	9
		787	9	8
		5	10	10
		219	11	7
		775	12	15
		1042	13	11
		1042	14	12
		5	15	17
		817	16	14
		219	17	16
		817	18	18
		778	19	20
		778	20	19
391	Pseudotsuga Douglasii	708	1	1
		708	2	2
		704	3	3
		1018	4	8
		1018	5	10
		1016	6	33
		989	7	7
		1016	8	18
		705	9	14
		627	10	5
		881	11	9
		881	12	13
		1008	13	19
		706	14	11
		720	15	15
		1011	16	17
		627	17	12
		720	18	30
		1011	19	32
		974	20	16
		732	21	21
		732	22	29
		973	23	25
		973	24	20
391	Pseudotsuga Douglasii—continued	1022	25	26
		1008	26	28
		271[2]	27	24
		1020	28	31
		1022	29	6
		986	30	23
		1020	31	4
		702	32	34
		709	33	22
		709	34	27
394	Abies subalpina	449	1	3
		449[2]	2	6
		449[1]	3	5
		449[1]	4	1
		820	5	3
		820	6	4
396	Abies concolor	733	1	1
		639	2	3
		733	3	2
		639	4	4
		520	5	6
		529	6	5
401	Larix Americana	226[2]	1	1
		226	2	3
		774	3	10
		840	4	8
		786	5	2
		795	6	4
		774	7	5
		795	8	7
		840	9	9
		781	10	12
		786	11	6
		781	12	11
402	Larix occidentalis	1006	1	3
		1006	2	4
		984	3	1
		984	4	2
		719	5	5
		719	6	6

GENERAL REMARKS.

An examination of the results obtained from the various tests made upon the woods of North America indicate at least the important fact that within the limits of any species the weight and strength of any specimen of wood depends upon the actual proportion of the space occupied in the layers of annual growth with open ducts to the space occupied with compact, woody tissue, and to the size of these ducts; or in the case of the wood of Coniferæ, the proportion of space occupied with cells formed early in the season to that occupied with the smaller cells of the summer growth. The proportion between these two kinds of growth varies not only in every individual tree, but in different parts of the same tree. The causes which thus affect the growth of wood are not very apparent. It is not soil, nor age, nor general climatic conditions, it appears, which produce the different proportion between the solid and the light portions of the annual growth in any species, because in the same individual this proportion is found to vary from year to year. It varies very irregularly; nor does the rapidity of growth, as has been supposed, greatly affect the strength of wood, because the proportion of open to compact growth is little affected by rapid or slow increase of the tree's diameter. How far annual climatic variations affect the nature of the annual layers of growth has not been demonstrated, although it is not impossible that in years in which conditions favorable to rapid growth are extended late into the season, the proportion of the annual layer occupied by open, weak growth to the growth of the whole year would be greater than that formed in a year during which the season favorable for rapid growth was less extended.

It follows that while such experiments as those conducted by Mr. Sharples are necessary to establish maximum and relative values for any species, these being established, actual values of any given specimen of

wood may be determined by microscopic examination of its structure; that is, two specimens of the wood of any species to which the census tests have been applied being given, their relative values can be determined by an examination of their structure as well as or better than by any elaborate experiments.

TANNIN VALUES.

The amount of tannin contained in the bark of various trees of the United States has been determined.

These determinations give the proportion of tannin. They do not indicate the real value of the bark of the species for tanning, which can only be obtained by actual experiments made on a large scale, other properties in the bark, beside the percentage of tannin, affecting the value of the leather prepared with it.

These determinations must therefore be regarded as approximations, which will serve, in some cases, to indicate species not now in general use for this purpose, which may be looked to as possible sources of tannin supply.

The methods adopted by Mr. Sharples in making these determinations are described by him as follows:

The tannin in each case was determined in the rossed bark; that is, bark deprived of the main part of the outside coating. The method employed was that devised by Lowenthal, which may be thus briefly described: A standard decoction of the bark is titrated with permanganate of potash, a quantity of indigo being first added to it. In a second portion the tannin is precipitated by means of gelatine, and the gallic acid in the liquid again determined by permanganate and indigo. The difference between these two readings gives the amount of tannin in the bark, the value of the permanganate having previously been determined by pure tannic acid, or by oxalic acid and calculation.

The bark of the following species has been examined:

Catalogue number.	Botanical name.	Common name.	Per cent. of tannin.	Per cent. of ash.	Catalogue number.	Botanical name.	Common name.	Per cent. of tannin.	Per cent. of ash.
14	Gordonia Lasianthus	Loblolly Bay. Tan Bay	13.14	2.35	275	Quercus Kelloggii	Black Oak	6.76	8.64
93	Prosopis juliflora	Mesquit. Algaroba. Honey Locust. Honey Pod.	4.04	8.71	276	Quercus nigra	Black Jack. Jack Oak	4.96	6.28
					277	Quercus falcata	Spanish Oak. Red Oak	8.59	4.32
140	Rhizophora Mangle	Mangrove	31.04	6.70	287	Quercus densiflora	Tanbark Oak. Chestnut Oak. Peach Oak.	16.46	3.84
160	Exostemma Caribæum		5.81	7.16					
251	Quercus alba	White Oak	5.99	6.11	290	Castanea vulgaris, *var.* Americana.	Chestnut	6.25	2.00
256	Quercus macrocarpa	Burr Oak. Mossy-cup Oak. Over-cup Oak.	4.59	8.05	382	Picea nigra	Black Spruce	7.20	2.84
					384	Picea Engelmanni	White Spruce	20.56	2.75
260	Quercus Prinus	Chestnut Oak. Rock Chestnut Oak.	6.25	3.83	384	Picea Engelmanni	do	17.01	2.32
					384	Picea Engelmanni	do	12.60	0.75
261	Quercus prinoides (old tree)	Yellow Oak. Chestnut Oak. Chinquapin Oak.	4.33	8.38	387	Tsuga Canadensis	Hemlock	13.11	1.31
					389	Tsuga Mertensiana	do	14.42	1.44
261	Quercus prinoides (young tree)	do	10.33	6.23	389	Tsuga Mertensiana	do	15.87	1.49
267	Quercus virens	Live Oak	10.46	8.89	390	Tsuga Pattoniana		15.72	2.48
269	Quercus Emoryi	Black Oak	9.76	15.09	391	Pseudotsuga Douglasii	Red Fir. Yellow Fir. Oregon Pine. Douglas Fir.	13.79	1.56
272	Quercus rubra	Red Oak. Black Oak	4.56	4.43					
274	Quercus tinctoria	Black Oak. Yellow-bark Oak. Quercitron Oak. Yellow Oak.	5.90	5.78					

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
MAGNOLIACEÆ.								
1. Magnolia grandiflora *Big Laurel. Bull Bay.*	346	Alabama	Cottage Hill	C. Mohr	Rich loam	0.372	116	
2. Magnolia glauca *Sweet Bay. White Bay. Beaver Tree. White Laurel. Swamp Laurel.*	354	do	do	do	Swampy	0.268	91	20
3. Magnolia acuminata *Cucumber Tree. Mountain Magnolia.*	246	Virginia	Wytheville	H. Shriver	Clay limestone			
	261[1]	do	Fancy Gap	do	Rich, light			
	261[2]	do	do	do	do			
	261[3]	do	do	do	do			
	534	Mississippi	Selvers' mill	C. Mohr	do	0.198	26	14
4. Magnolia cordata *Cucumber Tree.*	1178	Alabama	Winston county	C. Mohr				
5. Magnolia macrophylla *Large-leaved Cucumber Tree.*	22	North Carolina	Statesville	M. E. Hyams	Rich	0.050	18	
	532	Mississippi	Quitman	C. Mohr	Rich, low			
6. Magnolia Umbrella *Umbrella Tree. Elk Wood.*	266[1]	Virginia	Wytheville	H. Shriver		0.072	15	8
	266[2]	do	do	do				
	266[3]	do	do	do				
7. Magnolia Fraseri *Long-leaved Cucumber Tree.*	260[1]	do	Fancy Gap	do	Damp	0.085	20	
	260[2]	do	do	do	do			
	260[3]	do	do	do	do			
8. Liriodendron Tulipifera *Tulip Tree. Yellow Poplar. White Wood.*	138	Michigan	Dansville	W. J. Beal	Sandy			
	165	Ohio	D. E. McSherry & Co.	E. E. Barney				
	174	Tennessee	Woodsum Machine Company.	do				
	177	Ohio	Barney & Smith Manufacturing Co.	do				
	178	do	D. E. McSherry & Co.	do				
	187	do	J. W. Stoddard & Co.	do				
	188	do	Barney & Smith Manufacturing Co.	do				
	305	Michigan	Lansing	W. J. Beal				
	818	West Virginia	Grafton	C. G. Pringle				
	1231	Pennsylvania	Chester county	P. P. Sharples				
	1232	do	do	do				
ANONACEÆ.								
9. Asimina triloba *Papaw. Custard Apple.*	211	Missouri	Meramec river, Jefferson county.	G. W. Letterman	Alluvial	0.169		
	332	Tennessee	Cumberland river	A. Gattinger	do	0.086		
10. Anona laurifolia *Pond Apple.*	479	Florida	Bay Biscayne	A. H. Curtiss	Swampy	0.240	47	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6040	0.6680	.....	0.6360	0.40	0.65	0.53	39.63	Second sp. gr. determination made on sap-wood	346
0.5034	0.5037	.....	0.5035	0.42	0.53	0.47	31.38		354
0.5012	0.5419	.....	0.5216	0.29	0.26	0.27	.....		246
0.4399	.....	.....	0.4399	0.25	.....	0.25	.....		261[1]
0.4562	.....	.....	0.4562	0.30	.....	0.30	.....		261[2]
0.4215	.....	.....	0.4215	0.30	.....	0.30	.....		261[3]
0.5065	0.5058	.....	0.5061	0.34	0.33	0.34	.....		534
			0.4690			0.29	29.23		
0.4095	0.4184	0.4101	0.4130	0.25	0.39	0.32	25.79	Third sp. gr. determination made on sap-wood; fourth sp. gr. determination, 0.4175.	1178
0.5375	0.4859	.....	0.5117	0.32	.....	0.32	.....	All sap-wood	22
0.5468	0.5594	.....	0.5501	0.45	0.34	0.39	.....		532
			0.5309			0.35	33.09		
0.3787	.....	.....	0.3787	0.19	.....	0.19	.....	Growth rapid	266[1]
0.5067	.....	.....	0.5067	0.18	.....	0.18	.....	Growth rapid; 0.5 sap-wood	266[2]
0.4606	.....	.....	0.4606	0.24	.....	0.24	.....	Growth rapid; all sap-wood	266[3]
			0.4487			0.20	27.96		
0.5430	.....	.....	0.5430	0.25	.....	0.25	.....	All sap-wood	260[1]
0.4976	.....	.....	0.4976	0.27	.....	0.27	.....		260[2]
0.4602	.....	.....	0.4602	0.33	.....	0.33	.....	All sap-wood	260[3]
			0.5003			0.28	31.18		
0.3843	.....	.....	0.3843	0.25	.....	0.25	.....		138
0.3831	0.3783	.....	0.3807	0.27	0.27	0.27	.....	Yellow poplar	165
0.3798	0.3787	.....	0.3792	0.20	0.22	0.21	.....	Yellow poplar (soft)	174
0.4475	0.4361	.....	0.4418	0.17	0.15	0.16	.....	Hard poplar	177
0.4512	0.4442	.....	0.4477	0.19	0.19	0.19	.....	Hard poplar	178
0.4362	0.4150	.....	0.4256	0.18	0.21	0.19	.....	Yellow poplar	187
0.4436	0.4551	.....	0.4493	0.25	0.30	0.27	.....		188
0.3774	.....	.....	0.3774	0.33	0.31	0.32	.....		395
0.4763	0.4822	.....	0.4793	0.26	0.29	0.28	.....		818
0.4444	0.4409	.....	0.4427	0.20	0.22	0.21	.....	White poplar	1231
0.4199	0.4712	.....	0.4455	0.19	0.16	0.18	.....	Yellow poplar	1232
			0.4230			0.23	26.36		
0.3549	0.3810	.....	0.3679	0.16	0.14	0.15	.....		211
0.4259	.....	.....	0.4259	0.24	0.30	0.27	.....		332
			0.3969			0.21	24.74		
0.4912	0.5199	0.5048	0.5053	4.94	4.79	4.86	31.49		479

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
CAPPARIDACEÆ.								
11. Capparis Jamaicensis	477	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.098	34	
	1186	do	do	do	do			
CANELLACEÆ.								
12. Canella alba *White Wood. Cinnamon Bark. Wild Cinnamon.*	499	do	Umbrella Key	do	do	0.620	17	
	1181	do	Elliott's Key	do	do	0.120	5	14
TERNSTRŒMIACEÆ.								
14. Gordonia Lasianthus *Loblolly Bay. Tan Bay.*	236	South Carolina	Bonneau's Depot	H. W. Ravenel	Wet pine-barren			
	414	do	Aiken	do	Swampy	0.330	22	25
STERCULIACEÆ.								
16. Fremontia Californica *Slippery Elm.*	1230	California	San Bernardino mountains.	C. G. Pringle				
TILIACEÆ.								
17. Tilia Americana *Lime Tree. Bass Wood. American Linden. Lin. Bee Tree.*	2	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.470	9	26
	124	Michigan	Big Rapids	W. J. Beal	Gravelly			
	252	Missouri	Allenton	G. W. Letterman	Alluvial	0.270	3	73
	316	Michigan	Hersey	W. J. Beal	Rich loam			
	1039	Massachusetts	Danvers	J. Robinson	Moist gravel	0.330	2	35
17. Tilia Americana, *var.* pubescens	745	Georgia	Bainbridge	A. H. Curtiss	Low	0.300	23	
18. Tilia heterophylla *White Bass Wood. Wahoo.*	285[1]	Kentucky	Cliffs Kentucky river	W. M. Linney	Limestone			
	285[2]	do	Mercer county	do	do			
	285[3]	do	do	do	do			
	320	Tennessee	Cumberland river	A. Gattinger	Alluvial			
MALPIGHIACEÆ.								
19. Byrsonima lucida *Tallowberry. Glamberry.*	510	Florida	Boca Chica Key	A. H. Curtiss	Coral	0.080	21	
	1113	do	No-Name Key	do	do			
	1117	do	Boca Chica Key	do	do	0.074	10	12
	1190	do	No-Name Key	do	do			
ZYGOPHYLLACEÆ.								
20. Guaiacum sanctum ? *Lignum-vitæ.*	476	do	Upper Metacombe Key.	do	do	0.178	18	55
	898	do		Department of Agriculture.				
	1133	do	Elliott's Key	A. H. Curtiss	Coral			
21. Porliera angustifolia	947	Texas	San Antonio	C. Mohr	Limestone	0.056	31	
RUTACEÆ.								
22. Xanthoxylum Americanum *Prickly Ash. Toothache Tree.*	80	Missouri	Allenton	G. W. Letterman	Alluvial	0.087	5	9
	892	Michigan	Lansing	W. J. Beal	do	0.066	4	23

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6690	0.6600	.....	0.6649	5.60	5.77	5.68	.....	.....	477
0.7272	0.7315	.....	0.7293	3.82	3.88	3.85	.....	.....	1188
			0.6971			4.76	43.44		
0.9570	0.9593	.....	0.9582	0.75	0.95	0.85	.....	All sap-wood	499
1.0390	1.0017	.....	1.0203	2.66	2.65	2.66	.....	0.5 sap-wood	1131
			0.9893			1.75	61.65		
0.3852	0.4659	.....	0.4255	0.49	0.44	0.47	.....	.....	236
0.5146	0.5255	.....	0.5201	1.02	1.08	1.05	.....	.....	414
			0.4728			0.76	29.47		
0.6995	0.7288	.....	0.7142	1.51	1.86	1.69	44.51	.....	1230
0.4626	0.4722	.....	0.4674	0.30	0.33	0.31	.....	.....	2
0.3815	.....	.....	0.3815	0.32	0.38	0.35	.....	.....	124
0.5035	0.4378	.....	0.4706	0.97	1.08	1.02	.....	.....	252
0.5166	.....	.....	0.5166	0.55	0.64	0.60	.....	All sap-wood	316
0.4272	0.4168	0.4362	0.4266	0.42	0.48	0.45	.....	.....	1039
			0.4525			0.55	28.20		
0.4103 0.4087	0.3885 0.4220	.....	0.4074	0.68 0.62	0.67 0.64	0.65	25.39	Growth very rapid	745
0.4927	.....	.....	0.4927	0.45	.....	0.45	.....	Second growth	285[1]
0.3791	.....	.....	0.3791	0.67	.....	0.67	.....	.....	285[1]
0.3674	.....	.....	0.3674	0.86	.....	0.86	.....	.....	285[1]
0.4695	0.4545	.....	0.4620	0.48	0.53	0.50	.....	.....	320
			0.4253			0.62	26.51		
0.5257	0.5360	.....	0.5308	2.84	2.85	2.85	.....	.....	510
0.5909	0.6733	0.6743	0.6478	2.40	1.94	2.17	.....	.....	1113
0.5681	0.5791	0.5875	0.5782	2.75	2.56	2.65	.....	.....	1119
0.6009	0.5964	.....	0.5987	1.94	2.40	2.17	.....	.....	1190
			0.5888			2.46	36.69		
1.1845	1.2180	0.9563	1.1196	0.87	0.92	0.90	.....	0.5 sap-wood	476
1.2736	1.1700	.....	1.2218	0.51	0.81	0.66	.....	Second sp. gr. determination made on 0.5 sap-wood	898
1.0997	1.0998	1.0652	1.0882	0.86	0.94	0.90	.....	0.66 sap-wood	1133
			1.1432			0.82	71.24		
1.1280	1.0843	1.1230	1.1101	0.53	0.49	0.51	69.18	Sap-wood	947
0.6122	0.5969	.....	0.6045	0.60	0.58	0.59	.....	.....	80
0.5235	0.5290	.....	0.5262	0.54	0.55	0.54	.....	.....	392
			0.5654			0.57	35.23		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
23. Xanthoxylum Clava-Herculis *Toothache Tree. Prickly Ash. Sea Ash. Pepper Wood. Wild Orange.*	735	Florida	Chattahoochee	A. H. Curtiss	Dry, sandy			
	807	Georgia	Cumberland island	do				
	1086	Texas	Palestine	C. Mohr	Damp, sandy	0.352	20	10
23. Xanthoxylum Clava-Herculis, *var.* fruticosum	938	do	Austin	do	Dry, calcareous	0.098	33	
24. Xanthoxylum Caribæum *Satin Wood.*	1109	Florida	Bahia Honda Key	A. H. Curtiss	Coral			
	1140	do	do	do	do	0.136	4	54
25. Xanthoxylum Pterota *Wild Lime.*	481	do	Bay Biscayne	A. H. Curtiss	Coral			
	950	Texas	Matagorda bay	C. Mohr	Calcareous			
	1128	Florida	Bay Biscayne	A. H. Curtiss	Coral	0.84	13	31
26. Ptelia trifoliata *Hop Tree. Shrubby Trefoil. Wafer Ash.*	768	do	Aspalaga	do	Calcareous	0.04	23	
27. Canotia holocantha	1228	Arizona	Wickenburg	C. G. Pringle				
SIMARUBEÆ.								
28. Simaruba glauca *Paradise Tree.*	487	Florida	Bay Biscayne	A. H. Curtiss	Coral			
BURSERACEÆ.								
29. Bursera gummifera *Gum Elemi. Gumbo Limbo. West Indian Birch.*	462	do	Upper Metacombe Key.	do	do			
	903	do		Department of Agriculture.				
30. Amyris sylvatica *Torch Wood.*	475	do	Upper Metacombe Key.	A. H. Curtiss	Coral	0.128	61	
MELIACEÆ.								
31. Swietenia Mahogoni *Mahogany. Madeira.*	452	do	do	do	do	0.228	16	81
OLACINEÆ.								
32. Ximenia Americana *Wild Lime. Tallow Nut. Hog Plum. Mountain Plum.*	472	do	do	do	do	0.112	3	43
	1134	do	Umbrella Key	do	do			
ILICINEÆ.								
33. Ilex opaca *American Holly.*	280	South Carolina	Waverly Mills	W. St. J. Mazyck	Sandy loam	0.144	35	
	902	do.		Department of Agriculture.				
34. Ilex Dahoon *Dahoon. Dahoon Holly.*	484	Florida	Bay Biscayne	A. H. Curtiss	Low, damp	0.128	29	
34. Ilex Dahoon, *var.* myrtifolia	802	do	Jacksonville	do	do	0.148	28	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5139	0.5002	.....	0.5070	0.92	0.91	0.91	.....	.....	735
0.4880	0.4772	.....	0.4826	0.68	0.65	0.67	.....	.....	807
0.5392	0.5153	.....	0.5272	0.90	0.84	0.87	.....	.....	1086
			0.5056			0.82	31.51		
0.6139	0.5733	0.6030	0.5967	0.76	0.76	0.76	37.19	.....	938
0.8598	0.8965	.....	0.8782	1.59	2.01	1.80	.....	.....	1109
0.9090	0.9275	0.9302	0.9222	2.34	2.15	2.25	.....	.....	1140
			0.9002			2.02	56.10		
0.7480	0.7666	.....	0.7573	0.90	1.00	0.95	.....	.....	481
0.5807	0.5775	.....	0.5791	0.63	0.59	0.61	.....	.....	950
0.9000	0.8940	0.8955	0.8968	0.69	0.89	0.79	.....	.....	1123
			0.7444			0.78	46.39		
0.8238	0.8400	.....	0.8319	0.34	0.27	0.30	51.84	.....	768
0.6464	0.7305	.....	0.6885	6.13	4.54	5.33	42.91	.....	1228
0.4100	0.4172	.....	0.4136	0.93	0.92	0.93	25.78	.....	487
0.2677	0.2488	0.2587	0.2584	2.05	1.91	1.98	.....	.....	462
0.2823	0.4022	.....	0.3423	2.10	2.07	2.09	.....	.....	903
			0.3003			2.04	18.71		
1.0469	1.0450	.....	1.0459	0.66	0.51	0.59	65.18	.....	475
0.7335	0.7464	0.7047	0.7282	1.06	1.11	1.09	45.38	.....	452
0.8799	0.8925	.....	0.8862	0.55	0.69	0.62	.....	.....	472
0.9838	0.9505	0.9249	0.9531	0.84	0.82	0.83	.....	0.5 sap-wood	1134
			0.9196			0.73	57.31		
0.6046	0.6624	.....	0.6335	0.71	0.55	0.63	.....	.....	280
0.5524	0.5078	.....	0.5301	1.04	0.71	0.88	.....	.....	902
			0.5818			0.76	36.26		
0.4791	0.4820	.....	0.4806	0.94	0.88	0.91	29.95	.....	484
0.5886	0.5860	.....	0.5873	0.95	0.84	0.90	36.60	.....	802

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sapwood.	Heartwood.
35. Ilex Cassine *Cassena. Yaupon. Yopon.*	345	Alabama	Cottage Hill	C. Mohr	Sandy	0.076	17	
	804	Florida	Saint John's river	A. H. Curtiss	Rich, sandy			
	952	Texas	Matagorda bay	C. Mohr	Light			
36 Ilex decidua	56	Missouri	Allenton	G. W. Letterman	Low, damp			
	335	Texas	Dallas	J. Reverchon	Upland			
	753	Florida	Chattahoochee river	A. H. Curtiss	Clay	0.086	33	
	945	Texas	New Braunfels	C. Mohr	Alluvial			
CYRILLACEÆ.								
37. Cyrilla racemiflora *Iron Wood.*	341	Alabama	Chunchula	do	Damp, sandy	0.105		
	615	Georgia	Ogeechee river	A. H. Curtiss	Low			
38. Cliftonia ligustrina *Titi. Iron Wood. Buckwheat Tree.*	338	Alabama	Cottage Hill	C. Mohr	Wet	0.194	47	
CELASTRACEÆ.								
39. Euonymus atropurpureus *Burning Bush. Wahoo. Spindle Tree. Arrow Wood.*	63	Missouri	Allenton	G. W. Letterman	Alluvial			
	1078	do	do	do	do	0.092	22	
40. Myginda pallens	1188	Florida	Umbrella Key	A. H. Curtiss	Calcareous			
41. Schæfferia frutescens *Yellow Wood. Box Wood.*	478	do	Upper Metacombe Key.	do	Coral	0.110	71	
	1201	do	do	do	do			
RHAMNACEÆ.								
42. Reynosia latifolia *Red Iron Wood. Darling Plum.*	454	do	do	do	do	0.112	7	52
43. Condalia ferrea *Black Iron Wood.*	460	do	do	do	do	0.166	22	56
44. Condalia obovata *Blue Wood. Logwood. Purple Haw.*	941	Texas	New Braunfels	C. Mohr	Dry, calcareous	0.100	5	36
45. Rhamnus Caroliniana *Indian Cherry.*	43	Missouri	Allenton	G. W. Letterman	Limestone			
	521	Tennessee	Nashville	A. Gattinger	do			
	803	Florida	Saint John's river	A. H. Curtiss	Rich hummock	0.108	10	10
	1094	Arkansas	Jonesboro'	T. B. Kitchens		0.059	14	
46. Rhamnus Californica	1256	California	Santa Cruz mountains.	C. G. Pringle				
47. Rhamnus Purshiana *Bearberry. Bear Wood. Shittim Wood.*	993	Oregon	Portland	G. Engelmann and C. S. Sargent.	Rich, alluvial			
48. Ceanothus thyrsiflorus *Blue Myrtle.*	1101	California	Santa Cruz	C. L. Anderson		0.090	11	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7257	0.7185	.....	0.7221	0.74	0.70	0.72	.....	.....	345
0.6890	0.7191	.....	0.7041	1.04	1.11	1.08	.....	.....	804
0.7475	0.7619	.....	0.7547	0.89	0.72	0.81	.....	.....	952
			0.7270			0.87	45.31		
0.7976	.....	.....	0.7976	0.44	0.50	0.47	.....	.....	56
0.7888	.....	.....	0.7888	0.83	0.84	0.84	.....	.....	335
0.5910	0.5861	.....	0.5885	0.87	0.79	0.83	.....	.....	753
0.7960	0.7894	0.7939	0.7931	0.67	0.67	0.67	.....	.....	945
			0.7420			0.70	46.25		
0.7147	0.6563	.....	0.6855	0.41	0.43	0.42	.....	.....	341
0.6818	0.6608	.....	0.6713	0.42	0.40	0.41	.....	.....	615
			0.6784			0.42	42.28		
0.6350	0.6147	.....	0.6249	0.35	0.48	0.42	38.95	.....	388
0.6240	.....	.....	0.6240	0.70	0.58	0.64	.....	.....	63
0.6868	0.7018	.....	0.6943	0.51	0.53	0.52	.....	.....	1078
			0.6592			0.58	41.08		
0.9057	0.9039	.....	0.9048	3.88	2.95	3.42	56.39	.....	1188
0.7487	0.7728	.....	0.7608	2.79	2.91	2.85	.....	.....	478
0.7912	0.7850	.....	0.7881	2.15	2.28	2.22	.....	.....	1201
			0.7745			2.54	48.27		
1.0605	1.0825	.....	1.0715	3.24	3.15	3.20	66.78	.....	454
1.3020	1.3020	.....	1.3020	8.00	8.61	8.31	81.14	.....	460
1.2049	1.1949	.....	1.1999	7.03	7.02	7.03	74.78	0.125 sap-wood	941
0.5954	.....	.....	0.5954	0.19	0.18	0.19	.....	.....	43
0.5940	0.5962	.....	0.5951	0.76	0.98	0.87	.....	.....	521
0.4971	0.5301	.....	0.5136	0.47	0.52	0.50	.....	All sap-wood	803
0.4894 0.4789	0.4720 0.4825	.....	0.4807	1.15	0.81	0.98	.....	0.5 sap-wood	1094
			0.5462			0.64	34.04		
0.6000	.....	.....	0.6000	0.63	0.53	0.58	37.39	.....	1256
0.5665	0.5678	.....	0.5672	0.74	0.59	0.67	35.35	0.25 sap-wood	993
0.5805 0.5965	0.5604 0.5625	.....	0.5750	0.70	0.68	0.69	35.83	Growth rapid	1101

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
49. Colubrina reclinata *Naked Wood.*	502	Florida	Umbrella Key	A. H. Curtiss	Coral	0.126	6	45
	1139	do	do	do	do	0.100	13	24
SAPINDACEÆ.								
50. Æsculus glabra *Ohio Buckeye. Fetid Buckeye.*	297	Missouri	Allenton	G. W. Letterman	Rich, moist			
	386	do	do	do	Alluvial			
	427	Tennessee	Nashville	A. Gattinger	Rich, moist			
51. Æsculus flava *Sweet Buckeye.*	445	do	do	do	Rich upland			
52. Æsculus Californica *California Buckeye.*	684	California	Marin county	G. R. Vasey	do	0.250		
53. Ungnadia speciosa *Spanish Buckeye.*	944	Texas	New Braunfels	C. Mohr	Limestone	0.124	26	
54. Sapindus marginatus *Wild China. Soapberry.*	307	do	Dallas	J. Reverchon	Rich, damp			
	589	do	do	do	do			
	824	New Mexico	Rio Gila cañon	E. L. Greene	do			
	928	Texas	Austin	C. Mohr	Limestone	0.222	24	36
55. Sapindus Saponaria *Soapberry.*	568	Florida	Cape Sable	A. H. Curtiss	Rich, sandy, damp	0.134	41	
	1122	do	Key Largo	do	Coral			
56. Hypelate paniculata *Ink Wood. Iron Wood.*	463	do	Upper Metacombe Key.	do	do	0.262	15	80
57. Hypelate trifoliata *White Iron Wood.*	464	do	do	do	do	0.224	13	72
58. Acer Pennsylvanicum *Striped Maple. Moose Wood. Striped Dogwood. Goose-foot Maple. Whistle Wood.*	99	Vermont	Huntingdon	C. G. Pringle	Gravelly			
	372	do	do	do	do			
59. Acer spicatum *Mountain Maple.*	98	do	do	do	do			
	371	do	do	do	do			
60. Acer macrophyllum *Broad-leaved Maple.*	982	Oregon	Portland	G. Englemann and C. S. Sargent.	Rich, alluvial	0.220	30	40
	1023	do	Portland Furniture Company.	do				
61. Acer circinatum *Vine Maple.*	962	do	Portland	do	Moist, alluvial			
	1013	do	do	do	do			
	1014	Washington territory.	Wilkeson	do	do			
62. Acer glabrum *Dwarf Maple.*	526	Colorado	Englemann's cañon.	R. Douglas	Dry, gravelly	0.048	28	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8100	0.8516	.....	0.8308	1.29	1.14	1.21	.....	.....	502
0.8046	0.8166	0.8112	0.8108	2.31	2.26	2.29	.....	.....	1139
			0.8208			1.75	51.15		
0.4270	0.4358	.....	0.4314	1.01	1.00	1.01	.....	.....	297
0.4787	0.4625	.....	0.4706	0.83	0.85	0.84	.....	.....	366
0.4606	.....	.....	0.4606	0.77	0.68	0.73	.....	.....	427
			0.4542			0.86	28.31		
0.4241	0.4307	.....	0.4274	0.99	1.00	1.00	27.24	.....	445
0.4021	0.5038	.....	0.4980	0.66	0.73	0.70	31.04	.....	634
0.6392	0.6272	.....	0.6332	1.15	1.19	1.17	39.46	.....	944
0.7520	0.7980	.....	0.7750	1.42	1.27	1.35	.....	.....	397
0.8324	0.8616	.....	0.8470	1.86	1.52	1.69	.....	.....	589
0.7978	0.8345	.....	0.8162	1.44	.....	1.44	.....	.....	824
0.7550	0.8522	0.8296	0.8123	1.54	1.52	1.53	.....	.....	928
			0.8126			1.50	50.64		
0.8595	0.8763	.....	0.8679	3.82	3.30	3.56	.....	.....	568
0.7940	0.8024	0.8204	0.8056	5.00	5.25	5.13	.....	.....	1122
			0.8367			4.34	52.14		
0.9600	0.9465	.....	0.9533	1.23	1.27	1.25	59.41	.....	463
0.9656	0.8548	.....	0.9102	1.35	1.41	1.38	56.72	.....	464
0.5111	0.5119	.....	0.5115	0.32	0.35	0.34	.....	.....	99
0.5564	0.5100	0.5789	0.5484	0.44	0.30	0.37	.....	.....	372
			0.5299			0.36	33.02		
0.5198	0.5205	.....	0.5202	0.42	0.37	0.40	.....	All sap-wood	98
0.5490	0.5528	0.5353	0.5457	0.48	0.41	0.45	.....	.....	371
			0.5330			0.43	33.22		
0.5057	0.5020	0.5254	0.5113	0.59	0.57	0.58	.....	.....	982
0.4323	0.5087	.....	0.4705	0.49	0.49	0.49	.....	.....	1023
			0.4909			0.54	30.59		
0.6824	0.6720	.....	0.6772	0.39	0.39	0.39	.....	.....	962
0.6587	0.6660	.....	0.6624	0.35	0.37	0.36	.....	.....	1013
0.6370	0.6800	.....	0.6585	0.41	0.44	0.43	.....	.....	1014
			0.6660			0.39	41.51		
0.6032	0.6023	.....	0.6028	0.31	0.29	0.30	37.57	.....	526

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
63. Acer grandidentatum	886	Utah	City Creek cañon	M. E. Jones	Moist, gravelly	0.050	12	
64. Acer saccharinum *Sugar Maple. Sugar Tree. Hard Maple. Rock Maple.*	105	Vermont		C. G. Pringle	Gravelly			
	203	Ohio	Woodsum Machine Company.	E. E. Barney				
	298	Missouri	Allenton	G. W. Letterman	Rich uplands			
	299	do	do	do	do			
	376	Vermont	Charlotte	C. G. Pringle	Gravelly			
	409	New England	Charlestown Navy-yard.	S. H. Pook				
	1233	Vermont	Charlotte	F. H. Horsford				
	1234	do	do	do				
	1235	do	do	do				
64. Acer saccharinum, *var.* nigrum *Black Sugar Mapl*	213	do	do	C. G. Pringle	Clay			
	274[1]	Missouri	Allenton	G. W. Letterman	Low, alluvial			
	274[2]	do	do	do	Rich, alluvial			
	399	do	do	do	Low, alluvial			
	440	Tennessee	Nashville	A. Gattinger	Rich			
	757	Florida	Chattahoochee	A. H. Curtiss	Clay	0.268	51	
	1167	Missouri	Allenton	G. W. Letterman	Rich, alluvial			
65. Acer dasycarpum *Soft Maple. White Maple. Silver Maple.*	103	Vermont	Charlotte	C. G. Pringle	Swampy			
	367	do	do	do	do			
	448	Missouri	Allenton	G. W. Letterman				
	1052	Massachusetts	Topsfield	J. Robinson	Low meadow			
66. Acer rubrum *Red Maple. Swamp Maple. Soft Maple. Water Maple.*	20	do	Arnold Arboretum	C. S. Sargent	Drift	0.285	18	36
	530	Mississippi	Kemper's mill	C. Mohr	Rich, swampy	0.222	41	
	743	Georgia	Bainbridge	A. H. Curtiss	Low	0.252	22	54
	878	Massachusetts	Danvers	J. Robinson	do	0.108	30	3
	1048	do	North Reading	do	do	0.204	60	6
66. Acer rubrum, *var.* Drummondii	1239	Missouri	Poplar Bluff	G. W. Letterman				
	1240	do	do	do				
67. Negundo aceroides *Box Elder. Ash-leaved Maple.*	290	Missouri	Allenton	G. W. Letterman	Rich bottom			
	311	Texas	Dallas	J. Reverchon	do			
68. Negundo Californicum *Box Elder.*	645	California	Contra Costa county	G. R. Vasey	Rich, moist	0.240	14	
ANACARDIACEÆ.								
69. Rhus cotinoides *Chittam Wood.*	1176	Alabama	Huntsville	C. Mohr	Rich loam			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7012	0.6791	.....	0.6902	0.66	0.61	0.64	43.01	.....	886
0.6139	0.6003	.....	0.6071	0.44	0.40	0.42	.....	.....	105
0.6303	0.6300	.....	0.6332	0.51	0.45	0.48	.....	.....	203
0.7697	0.8098	.....	0.7898	0.54	0.59	0.57	.....	.....	298
0.7828	0.7680	.....	0.7750	0.60	0.57	0.59	.....	.....	299
0.6538	0.6783	.....	0.6661	0.93	1.10	1.02	.....	.....	376
0.6242	.....	.....	0.6242	0.36	0.44	0.40	.....	.....	409
0.7106	.....	.....	0.7106	0.91	0.33	0.62	.....	.....	1233
0.6893	0.6899	.....	0.6896	0.33	0.29	0.31	.....	.....	1234
0.7239	.....	.....	0.7239	0.48	0.35	0.42	.....	.....	1235
			0.6912			0.54	43.08		
0.7319	0.6935	0.6639	0.6964	1.48	1.01	1.25	.....	.....	213
0.7240	0.6980	.....	0.7115	0.56	.....	0.56	.....	.....	274[1]
0.7214	0.7002	.....	0.7108	0.52	.....	0.52	.....	.....	274[2]
0.7117	0.6799	.....	0.6958	0.70	0.56	0.63	.....	.....	399
0.6410	0.6429	.....	0.6419	1.31	1.02	1.17	.....	.....	440
0.6808	0.7008	0.7105	0.7014	0.55	0.33	0.44	.....	.....	757
0.6814	0.6840	.....	0.6827	0.42	0.36	0.39	.....	.....	1167
			0.6915			0.71	43.09		
0.4880	0.5254	.....	0.5072	0.31	0.32	0.32	.....	.....	103
0.4860	0.4828	.....	0.4844	0.30	0.31	0.31	.....	.....	367
0.4700	0.5062	.....	0.4911	0.40	0.42	0.41	.....	.....	448
0.6247	0.6163	0.6344	0.6251	0.29	0.27	0.28	.....	.....	1052
			0.5209			0.33	32.84		
0.6761	0.6845	.....	0.6803	0.24	0.25	0.25	.....	All sap-wood	20
0.5770	0.6064	.....	0.5917	0.43	0.42	0.43	.....	.....	530
0.5288	0.5510	0.5001	0.5466	0.49	0.49	0.49	.....	.....	743
0.6397	0.6496	0.6406	0.6433	0.32	0.33	0.33	.....	Second and third sp. gr. determinations made on sap-wood	878
0.6374	0.6185	0.6260	0.6273	0.38	0.32	0.35	.....	.....	1048
			0.6178			0.37	38.50		
0.5563	.....	.....	0.5563	0.31	0.31	0.31	.....	.....	1239
0.5355	.....	.....	0.5355	0.36	0.36	0.36	.....	.....	1240
			0.5459			0.34	34.02		
0.4332	0.4288	.....	0.4310	0.76	1.22	0.99	.....	.....	290
0.4217	0.4474	.....	0.4346	1.01	1.30	1.16	.....	.....	311
			0.4328			1.07	26.97		
0.4786	0.4856	.....	0.4821	0.51	0.57	0.54	30.04	.....	645
0.6196	0.6393	0.6686	0.6425	0.48	0.51	0.50	40.04	.....	1176

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
70. Rhus typhina *Staghorn Sumach.*	158	Vermont	Hinesburgh	C. G. Pringle	Gravelly			
	1060	Massachusetts	Danvers	J. Robinson	do	0.120	2	34
71. Rhus copallina *Dwarf Sumach.*	70	Missouri	Allenton	G. W. Letterman	Moist limestone			
	610	Georgia	Lower Altamaha river.	A. H. Curtiss	Dry, clay			
	736	Florida	Chattahoochee river.	do	do	0.175	5	19
71. Rhus copallina, *var.* lanceolata	330	Texas	Dallas	J. Reverchon	Dry, gravelly			
72. Rhus venenata *Poison Sumach. Poison Elder.*	876	Massachusetts	Danvers	J. Robinson	Wet, swampy	0.070	1	20
	1037	do	do	do	do	0.085	4	16
	1041	do	do	do	do	0.067	4	27
73. Rhus Metopium *Poison Wood. Coral Sumach. Mountain Manchineel. Burn Wood. Hog Plum. Doctor Gum.*	467	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.222	39	39
LEGUMINOSÆ.								
75. Eysenhardtia orthocarpa	1147	Arizona	Santa Rita mountains.	C. G. Pringle	Dry, rocky			
76. Dalea spinosa	1079	California	Agua Caliente	Parish Brothers	Dry, sandy			
77. Robinia Pseudacacia *Locust. Black Locust. Yellow Locust.*	405		Charlestown Navy-yard.	S. H. Pook				
	441	Tennessee	Nashville	A. Gattinger	Limestone			
	815	West Virginia	Grafton	C. G. Pringle				
	845	Massachusetts	Danvers	J. Robinson	Gravelly	0.184	4	35
78. Robinia viscosa *Clammy Locust.*	1061	do	do	do	Loam	0.060	4	8
79. Robinia Neo-Mexicana *Locust.*	1031	Colorado	Trinidad	W. B. Strong	Low, moist			
80. Olneya Tesota *Iron Wood. Arbol de Hierro.*	650	California	Lower Colorado valley.	G. Engelmann and C. S. Sargent.	Dry, gravelly			
81. Piscidia Erythrina *Jamaica Dogwood.*	564	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral			
82. Cladrastis tinctoria *Yellow Wood. Yellow Ash. Gopher Wood.*	33	Kentucky	Mercer county	W. M. Linney	Limestone			
	439	Tennessee	Nashville	A. Gattinger	Alluvial			
83. Sophora secundiflora *Frigolito.*	940	Texas	New Braunfels	C. Mohr	Limestone			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per *cubic foot*, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4476	0.4593	.....	0.4535	0.43	0.54	0.49	.....	.....	158
0.4079 0.3912	0.4855 0.3869	.....	0.4179	0.52	0.52	0.52	.....	.....	1060
			0.4357			0.50	27.15		
0.4907	0.5080	.....	0.5039	0.62	0.62	0.62	.....	.....	70
0.5478	0.5579	.....	0.5529	0.63	0.56	0.60	.....	.....	610
0.5472	0.4910	0.5367	0.5250	0.55	0.60	0.57	.....	.....	736
			0.5273			0.60	32.86		
0.5131	0.5236	.....	0.5184	0.80	0.80	0.85	32.31	.....	330
0.4383 0.4192	0.4362 0.4368	.....	0.4326	0.90	0.88	0.80	.....	.....	876
0.4365 0.4535	0.4322 0.4449	.....	0.4418	0.49	0.49	0.49	.....	.....	1037
0.4250	0.4511	0.4440	0.4403	0.50	0.60	0.55	.....	.....	1041
			0.4382			0.64	27.31		
0.8106	0.7728	.....	0.7917	2.31	2.47	2.39	49.34	.....	467
0.8691	0.8884	0.8646	0.8740	1.29	1.28	1.28	54.47	0.125 sap-wood.....	1147
0.5714 0.5285	0.5904 0.5241	.....	0.5536	3.41	4.68	4.04	34.50	First, second, and third sp. gr. determinations made on sap-wood; fourth sp. gr. determination made on 0.1 sap-wood.	1079
0.7550	0.7904	.....	0.7727	0.22	0.26	0.24	.....	.....	405
0.7908	.....	.....	0.7908	1.26	1.12	1.19	.....	.....	441
0.6490	0.6387	.....	0.6439	0.35	.....	0.35	.....	.....	815
0.7410	0.7279	0.7087	0.7259	0.22	0.25	0.24	.....	Third sp. gr. determination made on sap-wood. Cultivated	845
			0.7333			0.51	45.70		
0.8130 0.7942	0.8017 0.8287	.....	0.8094	0.22	0.19	0.20	50.44	0.125 sap-wood. Cultivated	1061
0.7988	0.7855	0.8258	0.8034	0.62	0.58	0.60	50.07	.....	1031
0.8953 1.1542	0.9600 1.1542	1.1374	1.0602	1.85 2.75	2.15 2.43	2.29	66.07	.....	650
0.8779	0.8689	.....	0.8734	3.42	3.34	3.38	51.43	.....	564
0.6072	0.6485	.....	0.6278	0.21	0.17	0.19	.....	.....	93
0.6277	.....	.....	0.6277	0.39	0.36	0.38	.....	.....	439
			0.6278			0.28	39.12		
1.0310	0.9890	0.9325	0.9842	1.44	1.74	1.59	61.34	First and second sp. gr. determinations made on sap-wood ...	940

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
84. Sophora affinis	329	Texas	Dallas	J. Reverchon	Dry, calcareous			
	932	do	Austin	C. Mohr	do	0.084	10	16
85. Gymnocladus Canadensis *Kentucky Coffee Tree. Coffee Nut.*	296	Missouri	Allenton	G. W. Letterman	Low, rich			
	402	do	do	do	Alluvial			
	519	Tennessee	Nashville	A. Gattinger	Limestone			
86. Gleditschia triacanthos *Honey Locust. Black Locust. Three-thorned Acacia. Sweet Locust. Honey Shucks.*	53[1]	Missouri	Allenton	G. W. Letterman	Low, rich			
	53[2]	do	do	do	do			
	444	Tennessee	Nashville	A. Gattinger	Dry, sandy barren			
87. Gleditschia monosperma *Water Locust.*	760	Florida	Chattahoochee river.	A. H. Curtiss	Alluvial	0.294	21	26
88. Parkinsonia Torreyana *Green-bark Acacia. Palo Verde.*	678	Arizona	Lower Colorado river.	G. Engelmann and C. S. Sargent.	Sandy			
89. Parkinsonia microphylla	1258	do	Valley of the Gila river.	C. G. Pringle				
90. Parkinsonia aculeata	829	Florida		Department of Agriculture.				
	1208	Texas	Austin	S. B. Buckley				
91. Cercis Canadensis *Redbud. Judas Tree.*	59	Missouri	Allenton	G. W. Letterman	Low, rich	0.260	5	35
	436	Tennessee	Nashville	A. Gattinger	Limestone			
	1089	Missouri	Allenton	G. W. Letterman	Rich			
	1090	do	do	do	do			
	1091	do	do	do	do			
92. Cercis reniformis *Redbud.*	1142	Texas	Austin	S. B. Buckley	Limestone			
93. Prosopis juliflora *Mesquit. Algaroba. Honey Locust. Honey Pod.*	561	do	Fort Stockton	B. L. Baldridge	Light, sandy			
	590	Arizona	Tucson	C. S. Sargent				
	680	do	do	do				
	927	Texas	Austin	C. Mohr	Rich, calcareous			
94. Prosopis pubescens *Screw Bean. Screw-pod Mesquit. Tornilla.*	600	California	Fort Yuma	G. Engelmann and C. S. Sargent.				
	658	do	do	do	Sandy			
	998	do	do	do		0.064	8	
95. Leucæna glauca	1224	Mexico	Lampasas mountains	S. B. Buckley				
96. Leucæna pulverulenta	1222	Texas	Brownsville	do	Sandy			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8010	0.8161	.....	0.8090	0.42	0.34	0.38	.....	0.25 sap-wood	329
0.8540	0.9316	.....	0.8928	1.04	1.13	1.09	.....	0.5 sap-wood	932
			0.8509			0.73	53.03		
0.6700	0.6786	.....	0.6743	0.70	0.57	0.64	.....	.....	296
0.6663	.....	.....	0.6663	0.45	0.50	0.48	.....	.....	402
0.7305	.....	.....	0.7395	0.98	0.82	0.90	.....	.....	519
			0.6934			0.67	43.21		
0.7330	0.7359	.....	0.7345	0.55	0.61	0.58	.....	.....	53[1]
0.6418	0.6275	.....	0.6346	0.60	.....	0.69	.....	.....	53[2]
0.6528	.....	.....	0.6528	1.20	0.98	1.14	.....	.....	444
			0.6740			0.80	42.00		
0.7500	0.7245	0.7272	0.7342	0.66	0.79	0.73	45.76	First sp. gr. determination made on sap-wood	760
0.6330	0.6732	.....	0.6531	1.25	1.00	1.12	40.70	Second sp. gr. determination made on sap wood	678
0.7176	0.7722	.....	0.7449	4.20	3.08	3.64	49.75	.....	1258
0.6325	.....	.....	0.6325	2.32	2.26	2.29	.....	.....	829
0.5848	0.5968	.....	0.5908	2.17	2.51	2.34	.....	.....	1268
			0.6116			2.32	38.11		
0.6104	0.6070	0.6157	0.6110	0.59	0.56	0.58	.....	.....	59
0.7098	.....	.....	0.7098	0.67	0.67	0.67	.....	.....	436
0.6254	0.5959	.....	0.6107	0.80	0.77	0.79	.....	.....	1089
0.6493	0.6084	.....	0.6289	0.82	0.74	0.78	.....	.....	1090
0.6009	0.6417	.....	0.6213	0.67	0.84	0.76	.....	.....	1091
			0.6363			0.72	39.65		
0.7392	0.7645	0.7502	0.7513	0.76	0.77	0.77	46.82	First and second sp. gr. determinations made on half sap wood	1142
0.8322	0.8664	.....	0.8493	3.35	2.69	3.02	.....	Root	561
0.7137	0.6997	.....	0.7067	1.67	1.71	1.69	.....	.....	590
0.7247	0.7726	.....	0.7487	1.45	2.49	1.97	.....	.....	680
0.7478	0.7620	0.7587	0.7562	2.09	2.00	2.05	.....	0.05 sap-wood	927
			0.7652			2.18	47.13		
0.7772	0.7910	.....	0.7841	1.02	0.98	1.00	.....	Dead tree; 0.75 sap-wood	600
0.7527	0.7930	.....	0.7729	0.91	0.90	0.91	.....	All sap-wood	658
0.7237	0.7278	.....	0.7258	0.95	.....	0.95	.....	All sap-wood	993
			0.7609			0.95	47.42		
0.9265	0.9205	.....	0.9235	3.27	3.31	3.29	57.55	.....	1224
0.6655	0.6809	.....	0.6732	0.90	1.13	1.01	41.95	.....	1222

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
97. Acacia Wrightii *Cat's Claw.*	1209	Texas	Austin	S. B. Buckley				
98. Acacia Greggii *Cat's Claw.*	598	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Dry, gravelly			
	607	do	do	do	do			
	893	do	Clifton	E. L. Greene				
100. Lysiloma latisiliqua *Wild Tamarind.*	509	Florida	Boca Chica Key	A. H. Curtiss	Coral	0.202	14	29
	1112	do	Key Largo	do	do			
101. Pithecolobium Unguis-cati *Cat's Claw.*	465	do	Upper Metacombe Key.	do	do			
	1108	do	Bahai Honda Key	do	do			
ROSACEÆ.								
102. Chrysobalanus Icaco *Cocoa Plum.*	480	do	Bay Biscayne	A. H. Curtiss	Swampy	0.100	47	
103. Prunus Americana *Wild Plum. Canada Plum. Horse Plum.*	68	Missouri	Allenton	G. W. Letterman	Rich uplands			
	220	Vermont	Charlotte	C. G. Pringle	Gravelly			
	334	Texas	Dallas	J. Reverchon	Rich			
104. Prunus angustifolia *Chickasaw Plum. Hog Plum.*	435	Tennessee	Nashville	A. Gattinger	River bluff			
105. Prunus Pennsylvanica *Wild Red Cherry. Pin Cherry. Pigeon Cherry.*	233	Vermont	Charlotte	C. G. Pringle	Cold, gravelly			
106. Prunus umbellata *Sloe. Black Sloe.*	606	Georgia	Altamaha river	A. H. Curtiss	Clay	0.216	21	24
107. Prunus emarginata, *var.* mollis	968	Washington territory.	Wilkeson	G. Engelmann and C. S. Sargent.	Low, rich			
108. Prunus serotina *Wild Black Cherry. Rum Cherry.*	15	Massachusetts	Roxbury	C. S. Sargent	Gravelly	0.205	9	31
	106	Vermont	Charlotte	C. G. Pringle	do			
	115	Michigan	Dansville	W. J. Beal	do			
	127	Missouri	Allenton	G. W. Letterman	Rich loam			
	148	Illinois	Waukegan	R. Douglas	Gravelly			
	198	Ohio	Barney & Smith Manufacturing Co.	E. E. Barney				
	317	Michigan	Hersey	W. J. Beal	Rich			
	368	Vermont	Charlotte	C. G. Pringle	Gravelly			
	406	Virginia or Middle states.	Charlestown Navy-yard.	S. H. Pook				
	725	Pennsylvania	Williamsport	C. G. Pringle				
	763	Florida	Chattahoochee river.	A. H. Curtiss	Clay	0.218	15	48
	1053	Massachusetts	Topsfield	J. Robinson	Gravelly	0.320	11	33
109. Prunus Capuli *Wild Cherry.*	294	New Mexico	Pinos Altos mountains.	E. L. Greene	Alluvial	0.238	7	12
	418	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.9380	0.9404	.....	0.9392	0.68	0.57	0.63	58.53	.....	1209
0.8703	.....	.....	0.8703	0.68	0.89	0.79	.....	0.05 sap-wood	598
0.8162	0.8616	.....	0.8389	0.95	.....	0.95	.....	0.05 sap-wood	607
0.8558	.....	.....	0.8558	1.00	.....	1.00	.....	.....	893
			0.8550			0.91	53.28		
0.6033	0.5663	.....	0.5848	2.00	2.44	2.22	.....	.....	509
0.6901	0.7159	0.6901	0.6987	1.98	2.07	2.03	.....	Rough bark	1112
			0.6418			2.12	40.00		
0.8829	0.8349	.....	0.8589	2.48	2.25	2.37	.....	.....	465
0.8885	1.0135	.....	0.9510	3.00	2.09	2.55	.....	.....	1108
			0.9049			2.46	56.39		
0.7290	0.8129	.....	0.7709	0.87	0.87	0.87	48.04	.....	480
0.6750	0.6745	.....	0.6748	0.11	0.09	0.10	.....	.....	68
0.7035	0.6800	.....	0.6918	0.17	0.21	0.19	.....	.....	220
0.7876	0.8079	.....	0.7978	0.33	0.21	0.27	.....	.....	334
			0.7215			0.18	44.96		
0.6675	0.7092	.....	0.6884	0.28	0.28	0.28	42.90	.....	435
0.5014	0.5031	.....	0.5023	0.36	0.43	0.40	31.30	.....	233
0.8162	0.8242	.....	0.8202	0.14	0.10	0.12	51.11	.....	606
0.4310	0.4694	.....	0.4502	0.18	0.23	0.21	28.06	.....	968
0.7047	0.7079	.....	0.7063	0.13	0.14	0.14	.....	0.5 sap-wood	15
0.5525	0.5539	.....	0.5532	0.13	0.11	0.12	.....	.....	106
0.5800	0.4832	.....	0.5321	0.12	0.15	0.14	.....	.....	115
0.6736	0.6235	.....	0.6486	0.19	0.17	0.18	.....	.....	127
0.6473	0.6508	.....	0.6491	0.11	0.13	0.12	.....	.....	148
0.5675	0.5659	.....	0.5667	0.13	0.11	0.12	.....	.....	198
0.5373	0.5186	.....	0.5280	0.19	0.17	0.18	.....	.....	317
0.5131	0.5351	.....	0.5241	0.14	0.17	0.16	.....	.....	368
0.4080	.....	.....	0.4080	0.06	0.09	0.08	.....	.....	406
0.5734	0.5777	.....	0.5756	0.09	0.10	0.10	.....	.....	725
0.5755	0.5221	.....	0.5488	0.17	0.34	0.25	.....	.....	763
0.6833	0.6857	0.6880	0.6857	0.15	0.17	0.16	.....	.....	1053
			0.5822			0.15	36.28		
0.7282	0.6940	.....	0.7111	0.16	0.12	0.14	.....	.....	294
0.8459	0.8837	.....	0.8648	0.28	0.26	0.27	.....	0.33 sap-wood	418
			0.7879			0.20	49.10		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
110. Prunus demissa *Wild Cherry.*	637	California	Strawberry valley	G. Engelmann and C. S. Sargent.	Low, rich			
111. Prunus Caroliniana *Wild Orange. Mock Orange. Wild Peach.*	549	Alabama	Mobile	C. Mohr	Sandy			
	806	Florida	Jacksonville	A. H. Curtiss	do	0.171	8	61
	916	do	Chattahoochee	C. Mohr	Alluvial	0.202	12	50
	1032	do	Jacksonville	A. H. Curtiss	Sandy			
	1062	Texas	Victoria	C. Mohr	Rich, moist	0.180	26	34
112. Prunus sphærocarpa	1217	Florida	Edge of Everglades.	A. H. Curtiss	Rocky			
113. Prunus ilicifolia *Islay.*	1158	California	Santa Cruz	C. L. Anderson		0.206	80	
114. Vauquelinia Torreyi	1152	Arizona	Santa Rita mountains.	C. G. Pringle				
115. Cercocarpus ledifolius *Mountain Mahogany.*	883	Utah	City Creek cañon	M. E. Jones	Rocky			
	904			Department of Agriculture.				
116. Cercocarpus parvifolius *Mountain Mahogany.*	825	California	Siskiyou county	G. Engelmann and C. S. Sargent.		0.062	3	27
117. Pyrus coronaria *American Crab. Sweet-scented Crab.*	808	Delaware	Kiamensi	W. M. Canby	Clay			
	1087	Pennsylvania	Nazareth	J. Henry	Moist			
	1088	do	do	do	do			
118. Pyrus angustifolia *American Crab Apple. Southern Crab Apple.*	313	South Carolina	Aiken	H. W. Ravenel	Rich, damp	0.130	25	
119. Pyrus rivularis *Oregon Crab Apple.*	1002	Oregon	Portland	G. Engelmann and C. S. Sargent.	Rich hills	0.186		
120. Pyrus Americana *Mountain Ash.*	214	Vermont	Charlotte	C. G. Pringle	Gravelly			
	305	do	Huntingdon	do	do			
121. Pyrus sambucifolia *Mountain Ash.*	410	do	Mount Mansfield	do	do	0.106	17	
122. Cratægus rivularis	885	Utah	City Creek cañon	M. E. Jones	do	0.064	14	13
123. Cratægus Douglasii	999	Oregon	Cascades of the Columbia river.	G. Engelmann and C. S. Sargent.	Rich	0.200	29	
124. Cratægus brachyacantha *Hogs' Haw.*	926	Louisiana	Webster parish	C. Mohr	Clay			
125. Cratægus arborescens	363[1]	South Carolina	Aiken	H. W. Ravenel	Rich			
	363[2]	do	do	do	do			
	607	Georgia	Ogeechee	A. H. Curtiss	Low	0.168	46	

OF DRY SPECIMENS OF WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7025	0.6937	0.6890	0.6951	0.51	0.48	0.50	43.32	.....	637
0.9515	0.9855	.....	0.9685	0.32	0.33	0.33	.....	.....	549
0.8874	0.8227	0.8314	0.8472	0.39	0.37	0.38	.....	.....	806
0.7766	0.7797	.....	0.7782	0.44	0.44	0.44	.....	.....	916
0.8660	0.8721	.....	0.8691	0.46	0.49	0.48	.....	.....	1032
0.9030	0.8610	0.8790	0.8810	0.43	0.43	0.43	.....	.....	1062
			0.8688			0.41	54.14		
0.9062	0.8934	.....	0.8998	0.97	0.76	0.87	56.07	.....	1217
0.9885	0.9720	.....	0.9803	0.80	0.76	0.78	61.09	.....	1158
1.1340	1.1408	.....	1.1374	1.44	1.46	1.45	70.88	.....	1152
1.0608	1.0332	1.0400	1.0447	1.27	1.12	1.19	.....	0.125 sap-wood	883
1.0950	1.1080	.....	1.1015	1.09	0.69	0.89	.....	.....	904
			1.0731			1.04	66.87		
0.9365	.....	.....	0.9365	0.45	.....	0.45	58.36	.....	825
0.6973	0.7228	0.7320	0.7174	0.52	0.48	0.50	.....	.....	808
0.6640	0.6762	0.6788	0.6730	0.50	0.38	0.44	.....	.....	1087
0.7402	0.7260	0.7057	0.7240	0.49	0.75	0.62	.....	.....	1088
			0.7048			0.52	43.92		
0.6945	0.6845	.....	0.6895	0.33	0.33	0.33	42.97	.....	313
0.8266	0.8366	.....	0.8316	0.41	0.41	0.41	51.82	.....	1002
0.5345	0.5420	0.5539	0.5438	0.98	1.23	1.11	.....	.....	214
0.5512	0.5416	.....	0.5464	0.56	0.56	0.56	.....	0.25 sap-wood	365
			0.5451			0.83	33.97		
0.5893	0.5963	.....	0.5928	0.39	0.31	0.35	36.94	Sap-wood	410
0.7072	0.7734	.....	0.7703	0.33	0.37	0.35	48.00	.....	885
0.7025	0.6928	0.6898	0.6950	0.29	0.36	0.33	43.31	.....	999
0.6750	0.6895	.....	0.6793	0.37	0.46	0.42	42.33	.....	926
0.6366 0.6093	0.6230 0.6225	.....	0.6228	0.63	0.70	0.67	.....	.....	363[1]
0.6263	0.6590	.....	0.6427	0.38	.....	0.38	.....	.....	363[2]
0.6934	0.6699	.....	0.6817	0.62	0.68	0.65	.....	.....	607
			0.6491			0.57	40.45		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
126. Cratægus Crus-galli *Cockspur Thorn. Newcastle Thorn.*	328	Massachusetts	Brookline	J. Robinson	Loam	0.180		
	1093	Missouri	Allenton	G. W. Letterman	Low, wet			
127. Cratægus coccinea *Scarlet Haw. Red Haw. White Thorn.*	100	Vermont	Monkton	C. G. Pringle	Gravelly			
128. Cratægus subvillosa *Scarlet Haw.*	949	Texas	Victoria	C. Mohr	Alluvial	0.180	61	
	1081	Missouri	Saint Louis	H. Eggert		0.106	28	
129. Cratægus tomentosa *Black Thorn. Pear Haw.*	154	Vermont	Charlotte	C. G. Pringle	Clay			
	426	Tennessee	Nashville	A. Gattinger	Limestone			
130. Cratægus cordata *Washington Thorn.*	447	do	do	do	Low			
131. Cratægus apiifolia *Parsley Haw.*	759	Florida	Chattahoochee	A. H. Curtiss	Alluvial	0.080	27	
132. Cratægus spathulata *Small-fruited Haw.*	300	South Carolina	Aiken	H. W. Ravenel	Rich, damp			
	614	Georgia	Ogeechee river	A. H. Curtiss	Low	0.880	38	
134. Cratægus æstivalis *May Haw. Apple Haw.*	239	South Carolina	Bonneau's Depot	H. W. Ravenel	Damp, rich			
135. Cratægus flava *Summer Haw. Yellow Haw.*	301	do	Aiken	do	Dry, fertile	0.224	58	
	560	Florida	Tampa	A. H. Curtiss	Sandy			
135. Cratægus flava, *var.* pubescens *Summer Haw. Red Haw.*	767	do	Aspalaga	do	Dry clay	0.142	44	
136. Heteromeles arbutifolia *Toyon. Tollon. California Holly.*	1160	California	Santa Cruz	C. L. Anderson		0.184	21	34
137. Amelanchier Canadensis *Juneberry. Shad Bush. Service Tree. May Cherry.*	156	Vermont	Charlotte	C. G. Pringle	Gravelly			
	241	Kentucky	Brumfield Station	W. M. Linney	Waverly shale	0.140	34	69
	849	Massachusetts	Danvers	J. Robinson	Loam	0.190	43	21
HAMAMELACEÆ.								
138. Hamamelis Virginica *Witch Hazel.*	867	do	Beverly	do	Rocky			
	875	do	Danvers	do	do			
	1259	Tennessee	Montvale	A. H. Curtiss				
139. Liquidambar Styraciflua *Sweet Gum. Star-leaved Gum. Liquid-amber. Red Gum. Bilsted.*	546	Alabama	Kemper's mill	C. Mohr	Rich, alluvial			
	1095	Arkansas	Little Rock	G. W. Letterman				
	1173	New Jersey	Mount Holly	S. P. Sharples	Clay	0.208	30	17
	1181	Mississippi	Yazoo River bottom	R. Abbey	Alluvial			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6590	0.6705	0.6632	0.6642	0.57	0.55	0.56	.....	Cultivated	328
0.7781	0.7667	0.7791	0.7746	0.40	0.60	0.55	.....		1093
			0.7194			0.56	44.83		
0.8654	0.8582	.....	0.8618	0.36	0.40	0.38	53.71		100
0.7909	0.7144	.....	0.7527	0.77	0.78	0.78	.....		949
0.8376	0.8382	.....	0.8379	0.54	0.68	0.61	.....		1081
			0.7953			0.69	49.56		
0.7649	0.7712	.....	0.7681	0.50	0.44	0.47	.....		154*
0.8050	0.7110	.....	0.7585	0.53	0.51	0.52	.....		426
			0.7633			0.50	47.57		
0.7105	0.7481	.....	0.7293	0.48	0.44	0.46	45.45		447
0.7506	0.7400	.....	0.7453	0.72	1.22	0.97	46.45		739
0.7524	0.7698	.....	0.7611	0.71	0.67	0.69	.....		300
0.6716	0.6700	.....	0.6708	0.60	0.63	0.62	.....		614
			0.7159			0.66	44.61		
0.6625	0.6503	.....	0.6564	0.57	0.56	0.57	40.91		239
0.7724	0.7620	.....	0.7672	0.82	0.94	0.88	.....		301
0.8172	0.7718	.....	0.7945	0.65	0.73	0.69	.....		563
			0.7800			0.79	48.67		
0.7770	0.7596	.....	0.7683	0.91	0.91	0.91	47.88		767
0.9610	0.9042	.....	0.9326	0.62	0.46	0.54	58.18		1164
0.6674	0.7042	.....	0.6858	0.61	0.64	0.63	.....	First sp. gr. determination made on 0.75 sap-wood; second sp. gr. determination made on 0.5 sap-wood.	156
0.7904	0.7944	.....	0.7924	0.42	0.53	0.48	.....	0.25 sap-wood	241
0.8600	0.9028	0.8570	0.8733	0.65	0.45	0.55	.....	First and third sp. gr. determinations made on 0.9 sap-wood; second sp. gr. determination made on sap-wood.	849
			0.7838			0.55	48.85		
0.7067 0.7081	0.7393 0.7826	.....	0.7342	0.43	0.44	0.44	.....		867
0.6662 0.7028	0.7823 0.6985	.....	0.7126	0.27	0.33	0.30	.....		875
0.6099	.....	.....	0.6099	0.32	0.39	0.36	.....		1259
			0.6856			0.37	42.72		
0.6415	0.6176	.....	0.6295	0.47	0.49	0.48	.....		546
0.5773	0.5665	.....	0.5719	0.48	0.73	0.61	.....		1095
0.5841	0.5991	.....	0.5916	0.29	0.34	0.32	.....	All sap-wood	1173
0.5605	0.5549	0.5692	0.5615	0.67	0.66	0.67	.....		1181

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
139. Liquidambar Styraciflua—continued	1182	Mississippi	Yazoo River bottom	R. Abbey	Alluvial			
	1183	do	do	do	do			
RHIZOPHORACEÆ.								
140. Rhizophora Mangle *Mangrove.*	485	Florida	Bay Biscayne	A. H. Curtiss	Salt-marsh	0.250	31	50
COMBRETACEÆ.								
141. Conocarpus erecta *Button Wood.*	489	do	do	do	do	0.164	15	34
142. Laguncularia racemosa *White Button Wood. White Mangrove.*	507	do	Sugar-loaf Sound	do	do			
MYRTACEÆ.								
143. Calyptranthes Chytraculia	1205	do	Key Largo	do	Coral			
144. Eugenia buxifolia *Gurgeon Stopper. Spanish Stopper.*	456	do	Upper Metacombe Key.	do	do	0.084	43	
	1118	do	Lost Man's river	do	Humus and coral			
	1120	do	Elliott's Key	do	Coral			
	1198	do	Upper Metacombe Key.	do	do			
145. Eugenia dichotoma *Naked Wood.*	566	do	Caximbas pass	do	Sandy	0.084	5	53
	1200	do	Palm Hummock	do	Coral			
146. Eugenia monticola *Stopper. White Stopper.*	1115	do	Umbrella Key	do	do	0.150	15	
	1136	do	do	do	do			
	1189	do	do	do	do			
147. Eugenia longipes *Stopper.*	1197	do	*No-Name Key*	do	do			
148. Eugenia procera *Red Stopper.*	1127	do	Miami	do	do	0.141	87	
CACTACEÆ.								
149. Cereus giganteus *Suwarrow. Saguaro. Giant Cactus.*	693	Arizona	Tucson	G. Engelmann and C. S. Sargent.	Dry, gravelly			
CORNACEÆ.								
150. Cornus alternifolia *Dogwood.*	860	Massachusetts	Danvers	J. Robinson	Loam			
	861	do	do	do	do			
151. Cornus florida *Flowering Dogwood. Box Wood.*	67	Missouri	Allenton	G. W. Letterman	Uplands	0.143	47	
	761	Florida	Chattahoochee	A. H. Curtiss	Calcareous	0.128	72	
	812	West Virginia	Grafton	C. G. Pringle	Dry			
	1077	Missouri	Allenton	G. W. Letterman	Gravelly	0.122	44	7
	1092	do	do	do	Flinty			
152. Cornus Nuttallii *Flowering Dogwood.*	900	Oregon	Portland	G. Engelmann and C. S. Sargent.				

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6125	0.5801	0.6256	0.6091	0.72	0.77	0.75	.....	.....	1182
0.5825	0.5765	0.5878	0.5823	0.85	0.77	0.81	.....	.....	1183
			0.5910			0.61	36.83		
1.1391	1.1842	.....	1.1617	1.80	1.83	1.82	72.40	.....	485
0.9939	0.9860	.....	0.9900	0.32	0.32	0.32	61.70	.....	489
0.7100	0.7174	.....	0.7137	1.69	1.54	1.62	44.48	.....	507
0.8930	0.9282	0.8765	0.8992	3.04	3.59	3.32	56.04	.....	1205
0.8753	.....	.....	0.8753	1.11	1.26	1.19	.....	.....	456
1.0625	1.0400	.....	1.0513	1.19	1.05	1.12	.....	.....	1118
0.8645	0.8540	1.0200	0.9128	2.23	2.15	2.19	.....	.....	1120
0.8857	0.9232	.....	0.9045	1.66	1.38	1.52	.....	.....	1198
			0.9360			1.50	58.33		
0.8526	0.8392	.....	0.8459	0.85	0.91	0.88	.....	.....	566
0.9542	0.9472	.....	0.9507	0.58	0.60	0.59	.....	.....	1200
			0.8983			0.74	55.98		
0.8910	0.9110	.....	0.9010	2.05	1.95	2.00	.....	.....	1115
0.9180	0.9340	0.9202	0.9241	1.60	1.95	1.77	.....	.....	1135
0.9140	0.9205	.....	0.9217	1.83	1.99	1.91	.....	.....	1189
			0.9156			1.89	57.06		
1.1450	1.1020	.....	1.1235	3.36	3.60	3.48	70.02	.....	1197
0.9425	0.9482	.....	0.9453	2.44	2.79	2.62	58.91	.....	1127
0.3259	0.3116	.....	0.3188	3.89	3.01	3.45	19.87	.....	693
0.6572	0.6748	0.6048	0.6456	0.43	0.41	0.42	.....	All sap-wood	860
0.6987	0.6932	0.6893	0.6937	0.39	0.43	0.41	.....	All sap-wood	861
			0.6696			0.41	41.73		
0.8264	0.8264	.....	0.8264	0.51	0.60	0.56	.....	.....	67
0.7599	0.7710	.....	0.7655	0.75	0.84	0.80	.....	.....	761
0.7892	0.7863	.....	0.7878	0.73	0.83	0.78	.....	.....	812
0.8690	0.8916	.....	0.8803	0.66	0.58	0.62	.....	.....	1077
0.8114	0.8215	.....	0.8165	0.62	0.60	0.61	.....	.....	1092
			0.8153			0.67	50.81		
0.7487	0.7474	.....	0.7481	0.48	0.52	0.50	46.62	.....	960

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
153. Nyssa capitata *Ogeechee Lime. Sour Tupelo. Gopher Plum.*	605	Georgia	Ogeechee river	A. H. Curtiss	Swampy	0.220	27	
154. Nyssa sylvatica *Tupelo. Sour Gum. Pepperidge. Black Gum.*	235	South Carolina	Bonneau's Depot	H. W. Ravenel	Muck			
	517	Tennessee	Cumberland river	A. Gattinger				
	608	Georgia	Ogeechee river	A. H. Curtiss	Muck	0.220	40	
	750	Florida	Chattahoochee	do	Clay	0.214	40	
	813	West Virginia	Grafton	C. G. Pringle				
	833	Massachusetts	West Newbury	J. Robinson	Rich	0.256	66	32
	834	do	do	do	do			
	835	do	Chebacco pond	do	Low, rich			
155. Nyssa uniflora *Large Tupelo. Cotton Gum. Tupelo Gum.*	128	South Carolina	Bonneau's Depot	H. W. Ravenel	Swampy			
	235	do	do	do		0.188	80	
	550	Alabama	Stockton	C. Mohr	Alluvial	0.320	67	10
	604	Georgia	Ogeechee river	A. H. Curtiss	Swampy			
CAPRIFOLIACEÆ.								
156. Sambucus glauca *Elder.*	681	California	Contra Costa county.	G. R. Vasey	Gravelly	0.320	6	28
157. Sambucus Mexicana *Elder.*	1220	Arizona	Santa Catalina mountains.	C. G. Pringle				
158. Viburnum Lentago *Sheepberry. Nannyberry.*	108	Vermont	Charlotte	do	Muck			
	370	do	Hinesburg	do	Swampy			
159. Viburnum prunifolium *Black Haw. Stag Bush.*	42	Kentucky	Mercer county	W. M. Linney	Shale			
	110[4]	do	do	do	Trenton limestone.			
	739	Georgia	Bainbridge	A. H. Curtiss	Clay	0.076	36	
RUBIACEÆ.								
160. Exostemma Caribæum	466	Florida	Upper Metacombe Key.	do	Coral	0.076	28	25
161. Pinckneya pubens *Georgia Bark.*	257	South Carolina	Bluffton	J. H. Mellichamp	Sandy, swamp	0.108	5	34
	381	do	do	do	do			
162. Genipa clusiæfolia *Seven-year Apple.*	457	Florida	Upper Metacombe Key.	A. H. Curtiss	Sandy			
	1132	do	Elliott's Key	do	Coral			
	1195	do	Upper Metacombe Key.	do	do			
163. Guettarda elliptica	471	do	do	do	do	0.095	34	
	1129	do	Umbrella Key	do	do			
	1194	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4680	0.4546	.....	0.4613	0.35	0.33	0.34	28.75	.....	605
0.5656	0.5649	.....	0.5652	0.66	0.81	0.74	.....	.....	235
0.5650	.....	.....	0.5650	0.89	0.79	0.84	.....	.....	517
0.6079	0.6104	.....	0.6092	0.49	0.43	0.46	.....	N. Caroliniana	608
0.6436	0.6682	.....	0.6559	0.49	0.49	0.49	.....	.....	750
0.6198	0.5865	.....	0.6031	0.52	0.53	0.53	.....	.....	813
0.6849	0.6787	0.6881	0.6839	0.41	0.40	0.41	.....	.....	833
0.7467	0.6748	0.6708	0.6974	0.38	0.39	0.38	.....	.....	834
0.7429	0.6626	0.7022	0.7026	0.32	0.34	0.33	.....	.....	835
			0.6353			0.52	39.59		
0.5589	0.5700	.....	0.5645	0.72	0.76	0.74	.....	.....	123
0.5656	0.5649	.....	0.5653	0.66	0.81	0.74	.....	.....	235
0.5002	0.5525	.....	0.5264	0.58	0.59	0.59	.....	.....	550
0.4424	0.4002	.....	0.4213	0.76	0.66	0.71	.....	.....	604
			0.5194			0.70	32.37		
0.5076	0.5098	.....	0.5087	1.60	1.55	1.57	31.70	.....	631
0.4588	0.4668	0.4586	0.4614	1.83	2.17	2.00	28.75	.....	1220
0.7285	0.7075	.....	0.7180	0.27	0.28	0.28	.....	0.1 sap-wood	108
0.7519	0.7332	.....	0.7426	0.29	0.30	0.30	.....	.....	376
			0.7303			0.29	45.51		
0.8106	.....	.....	0.8106	0.46	0.49	0.48	.....	0.75 sap-wood	42
0.9140	.....	.....	0.9140	0.47	.....	0.47	.....	All sap-wood	1104
0.7749	.....	.....	0.7749	0.60	.....	0.60	.....	All sap-wood	739
			0.8332			0.52	51.92		
0.9200	0.9419	.....	0.9310	0.24	0.22	0.23	58.02	.....	466
0.5528	0.5613	.....	0.5571	0.28	0.27	0.28	.....	.....	257
0.5126	0.5131	.....	0.5129	0.49	0.58	0.54	.....	.....	331
			0.5350			0.41	33.41		
1.0219	.....	.....	1.0219	0.71	0.60	0.66	.....	All sap-wood	457
1.0425	1.0270	0.9175	0.9957	1.00	1.02	1.01	.....	Second and third sp. gr. determinations made on 0.2 sap-wood	1132
1.0705	1.0840	.....	1.0772	1.48	1.55	1.52	.....	.....	1195
			1.0316			1.06	64.29		
0.9375	0.8933	.....	0.9154	0.88	0.79	0.84	.....	.....	471
0.8409	0.8598	.....	0.8504	0.94	1.03	0.99	.....	.....	1129
0.7490	0.7217	.....	0.7353	1.33	1.32	1.32	.....	.....	1194
			0.8337			1.05	51.96		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
ERICACEÆ.								
164. Vaccinium arboreum *Farkleberry.*	348	Alabama	Citronelle	C. Mohr	Sandy	0.127	65	
	612	Georgia	Altamaha river	A. H. Curtiss	Swampy			
165. Andromeda ferruginea	1033	Florida	Jacksonville	do	Hummock			
	1034	do	do	do		0.216	5	29
166. Arbutus Menziesii *Madroña.*	643	California	Contra Costa county	G. R. Vasey	Gravelly			
	679	do	Marin county	do	do			
167. Arbutus Xalapensis	596	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Rocky			
168. Arbutus Texana	1085	Texas	Hays county	S. B. Buckley	Limestone	0.086	22	26
169. Oxydendrum arboreum *Sorrel Tree. Sour Wood.*	353	Alabama	Cottage Hill	C. Mohr	Light, rich	0.130	28	
	515	Tennessee	Nashville	A. Gattinger	Sandy, rocky			
170. Kalmia latifolia *Laurel. Calico Bush. Spoon Wood. Ivy.*	262[1]	Virginia	Fancy Gap	H. Shriver	Moist	0.082	74	
	262[2]	do	do.	do	do			
	262[3]	do	do	do	do			
171. Rhododendron maximum *Great Laurel. Rose Bay.*	263[1]	do	do	do	do	0.078	52	
	263[2]	do	do	do	do			
MYRSINACEÆ.								
172. Myrsine Rapanea	1123	Florida	Bay Biscayne	A. H. Curtiss	Coral			
173. Ardisia Pickeringia *Marlberry. Cherry.*	494	do	do	do	do	0.080	15	18
	1136	do	do	do	do			
	1192	do	Palm creek	do	do			
174. Jacquinia armillaris *Joe Wood.*	498	do	Key Largo	do	do			
	1130	do	Elliott's Key	do	do			
	1199	do	Umbrella Key	do	do			
SAPOTACEÆ.								
175. Chrysophyllum oliviforme	492	do	Bay Biscayne	do	do	0.105	18	
176. Sideroxylon Mastichodendron *Mastic.*	461	do	Upper Metacombe Key.	do	do	0.266	29	49

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7814	0.7479	.....	0.7647	0.42	0.45	0.44	.....	.....	343
0.7740	0.7405	.....	0.7573	0.35	0.32	0.34	.....	.....	612
			0.7610			0.39	47.42		
0.7766	0.8021	.....	0.7894	0.45	0.37	0.41	.....	.....	1033
0.7037	0.7174	.....	0.7106	0.56	0.45	0.51	.....	.....	1034
			0.7500			0.46	46.74		
0.6452	0.6939	.....	0.6696	0.42	0.38	0.38	.....	.....	643
0.7482	0.7332	.....	0.7407	0.42	0.39	0.41	.....	.....	679
			0.7052			0.40	43.95		
0.7202 0.6842	0.6955 0.7397	.....	0.7099	0.21	0.24 0.30	0.25	.....	.....	596
0.7535	0.7674	0.7292	0.7500	0.54	0.48	0.51	46.74	0.5 sap-wood.....	1085
0.7920	0.7574	0.7916	0.7803	0.42	0.49	0.46	.....	.....	353
0.7114	.....	.....	0.7114	0.27	0.31	0.29	.....	.....	515
			0.7458			0.37	46.48		
0.7536	.....	.....	0.7536	0.61	.....	0.61	.....	.....	262[1]
0.7214	.....	.....	0.7214	0.31	.....	0.31	.....	.....	262[2]
0.6780	.....	.....	0.6780	0.32	.....	0.32	.....	.....	262[3]
			0.7160			0.41	44.62		
0.6266	.....	.....	0.6266	0.43	.....	0.43	.....	.....	263[1]
0.6341	.....	.....	0.6341	0.29	.....	0.29	.....	.....	263[2]
			0.6303			0.36	39.28		
0.8491	0.8541	0.7990	0.8341	0.74	0.88	0.81	51.98	.....	1123
0.8154	0.8412	.....	0.8283	1.81	1.84	1.83	.....	.....	494
0.8800	0.8532	.....	0.8666	1.74	1.95	1.85	.....	.....	1136
0.8770	0.8942	.....	0.8856	1.75	1.95	1.85	.....	.....	1192
			0.8602			1.85	53.61		
0.5693	0.6500	0.6582	0.6258	4.09	3.82	3.96	.....	.....	498
0.6437	0.6475	.....	0.6456	3.47	3.74	3.61	.....	.....	1130
0.8300	0.7965	.....	0.8132	2.85	2.73	2.79	.....	.....	1199
			0.6948			3.45	43.30		
0.8986	0.9433	0.9660	0.9360	1.36	1.11	1.24	58.33	.....	492
1.0125	1.0149	1.0052	1.0109	4.90	5.37	5.14	63.00	.....	461

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
177. Dipholis salicifolia *Bustic. Cassada.*	488	Florida	Bay Biscayne	A. H. Curtiss	Coral	0.170	36	14
	500	do	Umbrella Key	do	do	0.150	7	25
	1191	do	No-Name Key	do	do			
178. Bumelia tenax	746	Georgia	Bainbridge	do	Low	0.128	29	
179. Bumelia lanuginosa *Gum Elastic. Shittim Wood.*	60	Missouri	Allenton	G. W. Letterman	Limestone	0.286	57	
	930	Texas	Austin	C. Mohr	do	0.237	65	
	1083	Missouri	Allenton	G. W. Letterman	do			
180. Bumelia spinosa	1146	Arizona	Santa Catalina mountains.	C. G. Pringle	Rocky			
	1151	do	do	do	do			
181. Bumelia lycioides *Iron Wood. Southern Buckthorn.*	333	Tennessee	Nashville	A. Gattinger	Alluvial			
182. Bumelia cuneata *Ants' Wood. Downward Plum. Saffron Plum.*	503	Florida	Long Key	A. H. Curtiss	Coral			
	1124	do	Boca Chica Key	do	do			
183. Mimusops Sieberi *Wild Dilly.*	458	do	Upper Metacombe Key.	do	do	0.170	12	40
EBENACEÆ.								
184. Diospyros Virginiana *Persimmon.*	61	Missouri	Allenton	G. W. Letterman	Rich upland	0.158	56	
	425	Tennessee	Nashville	A. Gattinger	Rich loam			
	811	West Virginia	Grafton	C. G. Pringle				
	1084	Missouri	Allenton	G. W. Letterman	Rich upland			
	1162	do	do	do	do			
185. Diospyros Texana *Black Persimmon. Mexican Persimmon. Chapote.*	936	Texas	Austin	C. Mohr	Calcareous	0.098	37	
STYRACACEÆ.								
186. Symplocos tinctoria *Horse Sugar. Sweet Leaf.*	347	Alabama	Cottage Hill	do	Sandy	0.134	26	
	560	Arkansas	Texarkana	G. W. Letterman	do	0.123	47	
187. Halesia diptera *Snow-drop Tree. Silver-bell Tree.*	738	Georgia	Bainbridge	A. H. Curtiss	Low			
	922	Florida	Apalachicola	C. Mohr	Alluvial			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.9813	0.8887	.....	0.9350	0.34	0.32	0.33	.....	.....	488
0.9737	0.9233	.....	0.9485	0.26	0.31	0.29	.....	.....	509
0.9312	0.8912	.....	0.9112	0.37	0.33	0.35	.....	.....	1191
			0.9316			0.32	58.06		
0.7106	0.7479	.....	0.7293	0.71	0.84	0.78	45.45	.....	748
0.7541	0.7299	.....	0.7420	1.10	1.02	1.06	.....	.....	60
0.5947	0.5997	0.5777	0.5907	1.44	1.28	1.36	.....	.....	930
0.6221	0.6386	.....	0.6304	1.27	1.27	1.27	.....	.....	1088
			0.6544			1.23	40.78		
0.6580	0.6991	.....	0.6786	1.19	1.04	1.11	.....	.....	1146
0.6392 0.6505	0.6663 0.6658	.....	0.6419	1.32	1.43	1.37	.....	.....	1151
			0.6603			1.24	41.15		
0.7467	.....	.....	0.7467	0.81	0.81	0.81	46.53	.....	338
0.7567	0.7465	.....	0.7516	2.29	2.31	2.30	.....	.....	503
0.8420	0.8384	.....	0.8402	1.60	1.43	1.51	.....	.....	1124
			0.7959			1.90	49.60		
1.0525	1.0989	1.1000	1.0838	2.89	2.32	2.61	67.54	.....	458
0.7639	0.7465	.....	0.7552	1.03	1.03	1.03	.....	.....	61
0.8552	.....	.....	0.8552	0.95	1.12	1.04	.....	Female	425
0.7962	0.7864	.....	0.7913	0.83	0.70	0.77	.....	.....	811
0.7790	0.7920	.....	0.7855	0.86	1.02	0.94	.....	.....	1084
0.7710	0.7722	0.7570	0.7667	0.97	1.05	1.01	.....	Wood with black streaks	1162
			0.7908			0.96	49.28		
0.8325	0.8391	0.8664	0.8460	3.34	3.32	3.33	52.72	.....	936
0.5265	0.5593	.....	0.5429	0.72	0.81	0.77	.....	.....	347
0.5079	0.5360	.....	0.5220	0.62	0.57	0.60	.....	.....	560
			0.5325			0.68	33.18		
0.5481	0.5381	.....	0.5431	0.57	0.42	0.50	.....	.....	738
0.5999	0.5957	.....	0.5978	0.35	0.35	0.35	.....	.....	922
			0.5705			0.42	35.55		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
188. Halesia tetraptera *Rattlebox. Snow-drop Tree. Silver-bell Tree. Calico Wood.*	275	Virginia	Carter's ferry	H. Shriver	Rocky			
	613	Georgia	Altamaha river	A. H. Curtiss	Clay	0.088	17	
OLEACEÆ.								
189. Fraxinus Greggii	1221	Mexico	Lampasas mountains.	S. B. Buckley				
190. Fraxinus anomala	1105	Utah	Kane county	A. L. Siler	Sandy			
191. Fraxinus pistaciæfolia *Ash.*	591	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Low			
	892	Eastern Arizona	San Francisco mountains.	E. L. Greene				
193. Fraxinus Americana *White Ash.*	25	Massachusetts	Acushnet	E. A. Dana				
	39[1]	Missouri	Allenton	G. W. Letterman	Siliceous hills			
	39[2]	do	do	do	Alluvial			
	39[3]	do	do	do	do			
	114[1]	Michigan	Dansville	W. J. Beal	Clay			
	114[3]	do	Hudson	do				
	114[4]	do	Lansing	do				
	114[5]	do	Dansville	do	Clay			
	130	South Carolina	Bonneau's Depot	H. W. Ravenel	Wet			
	144	Illinois	Waukegan	Robert Douglas	Clay			
	170	Ohio	Pineo, Daniels & Co.	E. E. Barney				
	173	do	Farmers' Friend Manufacturing Co.	do				
	175	do	J. W. Stoddard & Co.	do				
	190	do	Woodsum Machine Co.	do				
	191	do	B. E. McSherry & Co.	do				
	212	Virginia	Wytheville	H. Shriver				
	227[1]	Vermont	Charlotte	C. G. Pringle	Gravelly			
	227[3]	do	do	do	Swampy			
	267[1]	Virginia	Wytheville	H. Shriver				
	267[2]	do	do	do				
	267[3]	do	do	do				
	431	Tennessee	Nashville	A. Gattinger	Limestone			
	551	Alabama	Kemper's mill	C. Mohr	Alluvial	0.268	70	
	728	Pennsylvania	Williamsport	C. G. Pringle				
	747	Georgia	Bainbridge	A. H. Curtiss	River-bottom	0.260	95	
	1045	Massachusetts	Reading	J. Robinson		0.215	64	
192. Fraxinus Americana, *var.* Texensis	364	Texas	Dallas	J. Reverchon	Dry, calcareous	0.384	69	
	937	do	Austin	C. Mohr	Rich, calcareous			
193. Fraxinus pubescens *Red Ash.*	139	Michigan	Lansing	W. J. Beal	Poor			
	229[1]	Vermont	Charlotte	C. G. Pringle	Clay			
	229[2]	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5617	0.5460	.....	0.5539	0.38	0.36	0.37	.....	.....	275
0.5569	0.5864	.....	0.5717	0.48	0.38	0.43	.....	.....	613
			0.5628			0.40	35.07		
0.7778	0.8030	.....	0.7904	0.97	0.89	0.93	49.26	.....	1221
0.6708	0.6485	.....	0.6597	0.81	0.88	0.85	41.11	Growth slow	1105
0.6336 0.7267	0.6243 0.6656	.....	0.6625	0.84 0.44	0.88 0.69	0.71	.....	.....	591
0.6868	0.7120	.....	0.6994	0.51	0.54	0.53	.....	.....	892
			0.6810			0.62	42.43		
0.5911	0.6682	.....	0.6297	0.29	0.32	0.31	.....	.....	25
0.6253	0.6481	.....	0.6367	0.33	0.34	0.34	.....	Wood from hills not considered valuable	39[1]
0.6223	.....	.....	0.6223	0.51	.....	0.51	.....	All sap-wood	39[2]
0.6771	.....	.....	0.6771	.....	.....	.....	.....	.....	39[3]
0.5265	0.4711	.....	0.4988	0.53	.....	0.53	.....	.....	114[1]
0.7225	.....	.....	0.7225	0.60	.....	0.60	.....	.....	114[3]
0.6506	.....	.....	0.6506	0.38	.....	0.38	.....	.....	114[4]
0.6086	.....	.....	0.6086	0.32	.....	0.32	.....	.....	114[5]
0.6744	0.7005	.....	0.6875	0.36	0.30	0.38	.....	All sap-wood	130
0.7631	0.7600	.....	0.7616	0.45	0.45	0.45	.....	All sap-wood; second growth. Growth rapid	144
0.7449	.....	.....	0.7449	0.35	0.37	0.36	.....	.....	170
0.7179	0.7116	.....	0.7148	0.39	0.39	0.39	.....	.....	173
0.6470	0.6473	.....	0.6472	0.31	0.29	0.30	.....	.....	175
0.6383	0.6387	.....	0.6385	.....	.....	.....	.....	.....	190
0.6116	.....	.....	0.6116	0.24	0.24	0.24	.....	.....	191
0.6157	0.6213	.....	0.6185	0.45	0.42	0.44	.....	0.5 sap-wood	213
0.6253	0.6326	.....	0.6290	0.30	.....	0.30	.....	.....	227[1]
0.6489	0.6987	.....	0.6738	0.26	.....	0.26	.....	.....	227[2]
0.6097	.....	.....	0.6097	0.43	.....	0.43	.....	0.5 sap-wood	267[1]
0.6329	.....	.....	0.6329	0.35	.....	0.35	.....	0.5 sap-wood	267[2]
0.6703	.....	.....	0.6703	0.44	.....	0.44	.....	All sap-wood	267[3]
0.6449	.....	.....	0.6449	0.74	0.69	0.72	.....	.....	431
0.6176	0.6481	.....	0.6329	0.55	0.48	0.52	.....	.....	551
0.6423	0.5944	.....	0.6184	0.37	0.28	0.33	.....	.....	728
0.5599	0.5972	.....	0.5786	0.68	0.71	0.70	.....	.....	747
0.9131	0.8141	0.8016	0.8429	0.47	0.39	0.43	.....	.....	1045
			0.6543			0.42	40.77		
0.8252	0.8530	.....	0.8391	0.56	0.49	0.53	.....	.....	364
0.7095	0.6667	.....	0.6881	0.86	0.87	0.87	.....	.....	937
			0.7636			0.70	47.59		
0.5066	0.6529	0.6779	0.6125	0.26	.....	0.26	.....	Poor quality	139
0.6619	.....	.....	0.6619	0.21	.....	0.21	.....	.....	229[1]
0.6455	.....	.....	0.6455	0.22	.....	0.22	.....	.....	229[2]

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
193. Fraxinus pubescens—continued	229[3]	Vermont	Charlotte	C. G. Pringle	Clay			
	1059	Massachusetts	Topsfield	J. Robinson	River-bottom			
194. Fraxinus viridis *Green Ash.*	57	Missouri	Allenton	G. W. Letterman	Rich, wet			
	308	Texas	Dallas	J. Reverchon	do	0.512	45	42
	438	Tennessee	Nashville	A. Gattinger	Rich upland			
	948	Texas	Victoria	C. Mohr	Rich, wet	0.144	31	
	957	do	Matagorda bay	do	do	0.184	34	
194. Fraxinus viridis, *var.* Berlandieriana. *Ash.*	1211	do	Austin	S. B. Buckley	do			
195. Fraxinus platycarpa *Water Ash.*	536	Alabama	Stockton	C. Mohr	Rich, alluvial	0.090	27	
196. Fraxinus quadrangulata *Blue Ash.*	66	Missouri	Allenton	G. W. Letterman	Dry upland	0.138	35	
	125	Michigan	Lansing	W. J. Beal	Rich loam			
	286[1]	Kentucky	Mercer county	W. M. Linney	Limestone			
	286[2]	do	do	do	do			
	286[3]	do	do	do	do			
	291	Missouri	Allenton	G. W. Letterman	Sandy loam			
	423	do	do	do	Rich upland			
	518	Tennessee	Nashville	A. Gattinger	Rich limestone			
197. Fraxinus Oregana *Oregon Ash.*	964	Oregon	Portland	G. Engelmann and C. S. Sargent.	Low, wet	0.355	46	47
	1001	do	Weidler's saw-mill	do				
	1024	do	Portland Furniture Company.	do				
	1030	do	do	do				
198. Fraxinus sambucifolia *Black Ash. Hoop Ash. Ground Ash.*	102	Vermont	Charlotte	C. G. Pringle	Wet, peaty			
	122	Michigan	Dansville	W. J. Beal	do			
	147	Illinois	Waukegan	Robert Douglas	Low, wet			
	378	Vermont	Charlotte	C. G. Pringle	Wet, peaty			
	839	Massachusetts	Danvers	J. Robinson	Rich, loamy	0.236	55	
199. Forestiera acuminata *Privet.*	616	Georgia	Ogeechee river	A. H. Curtiss	Rich, moist	0.075	31	
	737	do	Bainbridge	do		0.150	55	
	955	Texas	Matagorda bay	C. Mohr	Alluvial			
200. Chionanthus Virginica *Fringe Tree. Old Man's Beard.*	276	Virginia	Carter's ferry	H. Shriver	Rich, moist			
	751	Florida	Chattahoochee	A. H. Curtiss	Clay upland	0.141	47	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6459	.....	.....	0.6459	0.20	.....	0.20	.....	.....	220[3]
0.5957	0.5200	.....	0.5598	0.42	0.41	0.42	.....	All sap-wood	1059
0.5085	0.5489								
			0.6251			0.26	38.96		
0.6040	0.6701	.....	0.6071	0.47	0.62	0.55	.....	First sp. gr. determination made on 0.5 sap-wood	57
0.5947	0.6277	.....	0.6112	0.54	0.57	0.56	.....	.....	808
0.7350	.....	.....	0.7350	0.82	0.80	0.81	.....	All sap-wood	438
0.7728	0.8217	0.7902	0.7949	0.63	0.56	0.60	.....	Second and third sp. gr. determinations made on sap-wood	948
0.7198	0.7807	.....	0.7503	0.82	0.76	0.79	.....	Second sp. gr. determination made on sap-wood	957
			0.7117			0.65	44.35		
0.5774	0.5786	.....	0.5780	0.51	0.56	0.54	36.02	.....	1211
0.3567	0.3515	.....	0.3541	0.69	0.76	0.73	22.07	.....	536
0.3246	0.3440	.....	0.3343	0.63	0.67	0.65	.....	.....	66
0.4929	.....	.....	0.4929	0.96	.....	0.96	.....	.....	125
0.7789	.....	.....	0.7789	0.74	.....	0.74	.....	.....	286[1]
0.8131	.....	.....	0.8131	0.81	.....	0.81	.....	Second growth	286[2]
0.7469	.....	.....	0.7469	0.82	.....	0.82	.....	Second growth	286[3]
0.5967	0.6086	.....	0.6027	0.88	0.90	0.89	.....	.....	201
0.6897	0.6746	.....	0.6822	0.78	0.74	0.76	.....	.....	423
0.7960	.....	.....	0.7960	0.60	0.61	0.61	.....	.....	518
			0.7184			0.78	46.78		
0.6432	0.5947	.....	0.6189	0.11	0.43	0.27	.....	Second sp. gr. determination made on sap-wood	964
0.5314	0.6126	.....	0.5719	0.73	.....	0.73	.....	.....	1001
0.4553	0.4736	.....	0.4645	0.12	0.15	0.14	.....	Brash	1024
0.6317	0.6425	.....	0.6371	0.21	0.24	0.23	.....	Tough	1030
			0.5731			0.34	35.72		
0.6200	0.6338	.....	0.6274	0.62	0.57	0.60	.....	.....	102
0.5934	.....	.....	0.5934	0.89	.....	0.89	.....	.....	122
0.6859	0.6812	.....	0.6836	0.84	0.88	0.86	.....	Second sp. gr. determination made on 0.125 sap-wood	147
0.6485	0.5928	.....	0.6207	0.77	0.83	0.80	.....	.....	378
0.7020	0.7465	.....	0.7243	0.46	0.48	0.47	.....	All sap-wood	839
			0.6318			0.72	39.37		
0.7067	0.7500	.....	0.7284	0.75	0.72	0.74	.....	.....	616
0.5829	0.5681	.....	0.5755	0.65	0.72	0.69	.....	.....	737
0.5988	0.6002	.....	0.5995	0.88	0.60	0.74	.....	.....	955
			0.6345			0.72	39.54		
0.6476	0.4628	.....	0.5552	0.53	.....	0.53	.....	.....	276
0.7150	0.7165	0.7259	0.7191	0.39	0.56	0.48	.....	.....	751
			0.6372			0.51	39.71		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
201. Osmanthus Americanus *Devil Wood.*	283	Louisiana	Amite	C. Mohr	Rich, alluvial			
	344	Alabama	Cottage Hill	do	Low, rich			
	584	Florida	Saint John's river	A. H. Curtiss	Sandy loam	0.190	45	19
BORRAGINACEÆ.								
202. Cordia Sebestena *Geiger Tree.*	1202	do	Key West	do	Coral			
	1218	do	do	do	do			
203. Cordia Boissieri	1223	Texas	Brownsville	S. B. Buckley	Limestone			
204. Bourreria Havanensis *Strong Bark.*	455	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.092	45	
	1137	do	Key Largo	do	do			
205. Ehretia elliptica *Knackaway. Anaqua.*	827	Texas		Department of Agriculture.				
	942	do	New Braunfels	C. Mohr	Rich, alluvial	0.170	25	
BIGNONIACEÆ.								
206. Catalpa bignonioides *Catalpa. Catawba. Bean Tree. Cigar Tree. Indian Bean.*	167	Ohio	Alexandersville	S. H. Binkley and E. E. Barney.	Clayey loam			
	540	Alabama	Stockton	C. Mohr	Low, wet			
	744	Georgia	Bainbridge	A. H. Curtiss	Clay	0.238	8	17
207. Catalpa speciosa *Western Catalpa.*	38	Missouri	Charleston	C. S. Sargent	Wet clay	0.288	8	51
	160	Ohio	Dayton	E. E. Barney	Clay			
	166	Illinois	Cairo	D. Axtell	do			
	171	Indiana	Wabash river	E. E. Barney	Low, alluvial bottom.			
	180	Tennessee	Obion river	E. P. Hynds and E. E. Barney.	do			
	181	Missouri	New Madrid	E. E. Barney	do			
	182	Illinois	Ullin	do	do			
	183	Missouri	New Madrid	do	do			
	184	do	do	do	do			
	210	Indiana	Vincennes	do	do			
208. Chilopsis saligna *Desert Willow.*	556	New Mexico	Valley of the Upper Gila river.	E. L. Greene	Alluvial			
	595	Arizona	Tucson	G. Engelmann and C. S. Sargent.	Moist, gravelly			
	682	do	do	do	do			
209. Crescentia cucurbitina *Black Calabash Tree.*	1216	Florida	Bay Biscayne	A. H. Curtiss	Coral			
VERBENACEÆ.								
210. Citharexylum villosum *Fiddle Wood.*	483	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8156	0.8652	.....	0.8404	0.68	0.65	0.67	.....	0.5 sap-wood	283
0.8606	.....	.....	0.8606	0.26	0.29	0.28	.....	All sap-wood	344
0.7100	0.7544	.....	0.7322	0.43	0.43	0.43	.....	First sp. gr. determination made on sap-wood; second sp. gr. determination made on 0.75 sap-wood.	584
			0.8111			0.46	50.55		
0.7740	.....	.....	0.7740	.....	4.09	4.09	.....		1202
0.6008	0.6942	.....	0.6475	4.43	4.28	4.35	.....		1218
			0.7108			4.22	44.30		
0.6710	0.6870	.....	0.6700	3.67	3.39	3.53	42.31		1223
0.8280	0.8248	.....	0.8264	3.38	3.20	3.29	.....		455
0.7708	0.7960	0.7980	0.7883	2.28	2.27	2.28	.....		1137
			0.8073			2.79	50.31		
0.6636	0.6548	.....	0.6592	1.23	1.27	1.25	.....		827
0.6274	0.6302	.....	0.6288	1.33	1.41	1.37	.....		942
			0.6440			1.31	40.13		
0.4293	0.4270	.....	0.4282	0.40	0.41	0.41	.....	Cultivated	167
0.4694	0.4979	.....	0.4837	0.26	0.34	0.30	.....		540
0.4426	0.4177	.....	0.4302	0.47	0.37	0.42	.....		744
			0.4474			0.38	27.88		
0.4601	0.4446	.....	0.4524	0.30	0.41	0.36	.....		38
0.4586	0.4467	.....	0.4527	0.34	0.39	0.37	.....	Cultivated	160
0.3897	0.3829	.....	0.3863	0.36	0.34	0.35	.....		166
0.3850	0.3878	.....	0.3864	0.32	0.30	0.31	.....		171
0.4156	0.3783	0.4260	0.4066	0.45	0.50	0.48	.....		180
0.3900	.....	.....	0.3900	0.38	0.42	0.40	.....	From an old fence-rail	181
0.3968	.....	.....	0.3968	0.47	0.43	0.45	.....	From a post 47 years in the ground	182
0.4493	.....	.....	0.4493	0.43	0.37	0.43	.....	From a standing tree killed by earthquake in 1812	183
0.4535	.....	.....	0.4535	0.40	0.34	0.37	.....		184
0.3911	0.3907	.....	0.3909	0.38	0.39	0.39	.....		210
			0.4165			0.39	25.96		
0.6059	.....	.....	0.6059	0.37	0.37	0.37	.....		556
0.5631	.....	.....	0.5631	0.43	0.41	0.42	.....		595
0.6003	0.6026	.....	0.6015	0.32	0.32	0.32	.....		682
			0.5902			0.37	36.78		
0.6270	0.6368	.....	0.6319	1.47	1.23	1.35	39.38		1216
0.8775	0.8644	.....	0.8710	0.49	0.54	0.52	54.28		483

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
211. Avicennia nitida *Black Mangrove. Black Tree. Black Wood.*	490	Florida	Bay Biscayne	A. H. Curtiss	Coral	0.158	39	18
	826	do		Department of Agriculture.				
	828	do		do				
NYCTAGINACEÆ.								
212. Pisonia obtusata *Pigeon Wood. Beef Wood. Cork Wood. Pork Wood.*	474	do	Upper Metacombe Key.	A. H. Curtiss	Coral			
POLYGONACEÆ.								
213. Coccoloba Floridana *Pigeon Plum.*	473	do	do	do	do	0.156	48	27
214. Coccoloba uvifera *Sea Grape.*	453	do	do	do	Sandy	0.214	17	29
LAURACEÆ.								
215. Persea Carolinensis *Red Bay.*	585	do	Saint John's river	do	Sandy loam	0.188	12	45
215. Persea Carolinensis, *var.* palustris	340	Alabama	Mobile county	C. Mohr	Damp, sandy	0.372	119	
216. Nectandra Willdenoviana *Lance Wood.*	479	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral			
	1138	do	Bay Biscayne	do	do	0.086	27	
	1196	do	Upper Metacombe Key.	do	do			
217. Sassafras officinale *Sassafras.*	71	Missouri	Allenton	G. W. Letterman	Low, rich			
	387	do	do	do	Alluvial			
	446	Tennessee	Nashville	A. Gattinger	Rich			
	814	West Virginia	Grafton	C. G. Pringle				
	854	Massachusetts	Danvers	J. Robinson	Rich loam	0.232	11	68
	1163	Missouri	Allenton	G. W. Letterman	Low, alluvial			
218. Umbellularia Californica *Mountain Laurel. California Laurel. Spice Tree. Cagiput. California Olive. California Bay Tree.*	703	Oregon	Coos bay	G. Engelmann and C. S. Sargent.				
	897	California		Department of Agriculture.				
EUPHORBIACEÆ.								
219. Drypetes crocea *Guiana Plum. White Wood.*	468	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral			
	1185	do	No-Name Key	do	do			
	1193	do	Upper Metacombe Key.	do	do			
219. Drypetes crocea, *var.* latifolia	459	do	do	do	do	0.292	112	52
	1187	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
1.0010	1.0485	.....	1.0762	1.90	1.12	1.56	.....	0.5 sap-wood	490
0.9066	1.0522	.....	0.9794	1.71	1.72	1.71	.....	First sp. gr. determination made on sap-wood; second sp. gr. determination made on 0.5 sap-wood.	826
0.7074	0.6762	.....	0.6918	4.54	4.01	4.27	.....	All sap-wood	828
			0.9138			2.51	56.95		
0.6475	0.6582	.....	0.6529	7.44	7.79	7.62	40.69	.....	474
0.9620	1.0040	.....	0.9835	5.25	4.81	5.03	61.29	0.66 sap-wood	478
0.9149	0.9998	0.9759	0.9635	1.11	1.63	1.37	60.04	First sp. gr. determination made on 0.5 sap-wood; third sp. gr. determination made on 0.25 sap-wood.	453
0.6373	0.6485	.....	0.6429	0.66	0.85	0.76	40.07	.....	585
0.5977	0.6815	.....	0.6396	0.46	0.27	0.37	39.86	.....	340
0.8206	0.7050	.....	0.7628	0.83	0.68	0.75	.....	0.9 sap-wood	470
{ 0.7980	0.8482 }	.....	0.8147	0.52	0.59	0.56	.....	All sap-wood	1133
{ 0.8148	0.7980 }								
0.7222	0.6787	.....	0.7005	0.48	0.47	0.48	.....	.....	1196
			0.7003			0.60	47.94		
0.5030	0.5210	.....	0.5120	0.11	0.09	0.10	.....	.....	71
0.4900	0.4828	.....	0.4864	0.08	0.09	0.09	.....	.....	387
0.4542	.....	.....	0.4542	0.04	0.05	0.05	.....	.....	446
0.5266	0.5363	.....	0.5315	0.06	0.07	0.07	.....	.....	814
0.5765	.....	0.5773	0.5769	0.06	0.23	0.15	.....	.....	854
0.4558	0.4919	0.5055	0.4844	0.12	0.15	0.13	.....	.....	1163
			0.5042			0.10	31.42		
0.6526	0.6202	.....	0.6364	0.36	0.27	0.32	.....	.....	703
0.6607	0.6840	.....	0.6760	0.55	0.36	0.46	.....	.....	897
			0.6517			0.39	40.61		
0.9105	0.8448	.....	0.8821	8.58	8.16	8.37	.....	All sap-wood	403
0.8918	0.9119	.....	0.9019	3.19	3.26	3.23	.....	.....	1185
0.9690	0.9882	.....	0.9786	7.07	6.58	6.83	.....	.....	1193
			0.9209			6.14	57.39		
1.0060	0.9500	.....	0.9780	8.69	9.09	8.89	.....	.....	459
0.9048	0.8878	.....	0.8963	7.70	7.70	7.70	.....	.....	1187
			0.9346			8.29	58.24		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
220. Sebastiania lucida *Crab Wood. Poison Wood.*	469	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.116	30	40
	1126	do	do	do	do			
	1206	do	Key Largo	do	do			
221. Hippomane Mancinella *Manchineel.*	1110	do	Key West	do	do	0.129	35	
URTICACEÆ.								
222. Ulmus crassifolia *Cedar Elm.*	324	Texas	Dallas	J. Reverchon	Rich loam	0.484	52	76
	929	do	Austin	C. Mohr	do			
223. Ulmus fulva *Red Elm. Slippery Elm. Moose Elm.*	30[1]	Kentucky	Mercer county	W. M. Linney	Limestone			
	30[3]	do	do	do	do			
	30[4]	do	do	do	do			
	101	Vermont	Hinesburg	C. G. Pringle	Gravelly loam			
	120	Michigan	Dansville	W. J. Beal	Gravelly			
	134	Missouri	Allenton	G. W. Letterman	Rich, alluvial			
	366	Vermont	Charlotte	C. G. Pringle	Gravelly			
	369	do	do	do	do			
	429	Tennessee	Nashville	A. Gattinger	Clay			
	869	Massachusetts	Boxford	J. Robinson	Rich loam			
224. Ulmus Americana *White Elm. American Elm. Water Elm.*	19	do	Arnold Arboretum	C. S. Sargent	Drift	0.561	19	38
	202	Ohio	S. M. Brown & Co	E. E. Barney	Limestone			
	281[1]	Missouri	Allenton	G. W. Letterman	Alluvial			
	281[2]	do	do	do	do			
	958	Texas	Colorado river	C. Mohr	do	0.230	17	5
	1036	Massachusetts	Danvers	J. Robinson	Gravelly	0.160	7	17
	1049	do	North Reading	do	do	0.215	21	10
225. Ulmus racemosa *Rock Elm. Cork Elm. Hickory Elm. White Elm. Cliff Elm.*	116[1]	Michigan	Dansville	W. J. Beal	do			
	116[2]	do	Big Rapids	do	Low, gravelly			
	116[3]	do	do	do	do			
	116[4]	do	Hudson	do	Alluvial			
	314	do	Hersey	do	Rich loam			
	428	Tennessee	Nashville	A. Gattinger	do			
226. Ulmus alata *Wahoo. Winged Elm.*	133	South Carolina	Bonneau's Depot	H. W. Ravenel	do			
	380	Tennessee	Davidson county	A. Gattinger	Loam			
	533	Mississippi	Kemper's mill	C. Mohr	Alluvial	0.244	82	38

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
1.1195	1.0855	.....	1.1025	4.96	4.48	4.72	.....	0.25 sap-wood	469
1.0880	1.0765	1.0640	1.0768	1.82	1.96	1.89	.....	0.5 sap-wood	1126
1.0832	1.1010	.....	1.0921	1.65	1.82	1.74	.....	.....	1206
			1.0905			2.78	67.96		
0.5945	0.5600	.....	0.5772	6.29	5.11	5.10	35.97	.....	1110
0.6286	0.7185	.....	0.6736	1.05	1.03	1.04	.....	Ash of a knot, 1.85	324
0.7867	0.7640	.....	0.7754	1.41	1.30	1.36	.....	.....	920
			0.7245			1.20	45.15		
0.8263	0.8358	.....	0.8361	1.30	1.00	1.15	.....	.....	30[1]
0.7062	.....	.....	0.7062	0.70	.....	0.70	.....	.....	30[3]
0.6499	.....	.....	0.6499	0.60	.....	0.60	.....	.....	30[4]
0.5699	0.5538	.....	0.5619	0.86	0.81	0.84	.....	.....	101
0.6769	.....	.....	0.6769	0.82	.....	0.82	.....	.....	120
0.6841	0.6841	.....	0.6841	0.68	0.79	0.74	.....	.....	134
0.6540	0.7589	.....	0.7065	1.24	0.84	1.04	.....	.....	366
0.7330	0.6303	.....	0.6817	0.12	0.11	0.12	.....	.....	369
0.6706	.....	.....	0.6706	1.22	1.31	1.27	.....	.....	420
0.7613 0.7978	0.7522 0.8180	.....	0.7823	1.07	0.70	0.88	.....	.....	809
			0.6956			0.83	43.35		
0.5462	0.5309	.....	0.5386	0.86	0.82	0.84	.....	Specific gravity of wet sap-wood, 1.026	19
0.7459	0.7287	.....	0.7373	0.46	0.50	0.48	.....	Second sp. gr. determination made on sap-wood	202
0.6221	0.6054	0.6346	0.6207	0.93	.....	0.93	.....	.....	281[1]
0.6299	.....	.....	0.6299	0.86	.....	0.86	.....	.....	281[2]
0.6495	0.6480	0.6265	0.6413	1.04	0.99	1.02	.....	First sp. gr. determination made on 0.5 sap-wood; second sp. gr. determination made on 0.75 sap-wood; third sp. gr. determination made on sap-wood.	958
0.6382	0.7102	0.6742	0.6742	0.75	1.01	0.88	.....	Third sp. gr. determination made on sap-wood	1036
0.7173	0.7085	0.7116	0.7124	0.75	0.45	0.60	.....	First sp. gr. determination made on 0.25 sap-wood; second and third sp. gr. determinations made on sap-wood.	1049
			0.6508			0.80	40.54		
0.8144	.....	.....	0.8144	0.42	.....	0.42	.....	.....	116[1]
0.6846	.....	.....	0.6846	.....	.....	.....	.....	.....	116[2]
0.6803	0.5996	.....	0.6400	0.34	.....	0.34	.....	.....	116[3]
0.7345	.....	.....	0.7345	0.70	.....	0.70	.....	.....	116[4]
0.7290	0.7570	.....	0.7430	0.59	0.69	0.64	.....	.....	394
0.7414	.....	.....	0.7414	0.90	0.72	0.81	.....	.....	428
			0.7203			0.60	45.26		
0.8710	0.8544	.....	0.8627	1.02	1.12	1.07	.....	All sap-wood	193
0.5970	0.6230	.....	0.6100	1.14	1.17	1.16	.....	0.5 sap-wood	380
0.7632	0.7860	.....	0.7746	0.76	0.72	0.74	.....	.....	532
			0.7491			0.99	46.09		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
227. Planera aquatica	758	Florida	Chattahoochee	A. H. Curtiss	Rich, alluvial	0.246	38	
	918	do	do	C. Mohr	do			
228. Celtis occidentalis *Sugarberry. Hackberry.*	69	Missouri	Allenton	G. W. Letterman	Limestone	0.108	50	
	75[1]	do	do	do	Low, rich			
	75[2]	do	do	do	Alluvial			
	306	Texas	Dallas	J. Reverchon	do			
	375	Tennessee	Davidson county	A. Gattinger	Loam			
	864	Massachusetts	Plum Island	J. Robinson	Sandy		4	30
	873	do	Salem	do	Loam			
	1111	Missouri	Saint Louis	Henry Eggert	Moist loam	0.132	23	
228. Celtis occidentalis, *var.* reticulata *Hackberry. Palo Blanco.*	652	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Dry			
229. Ficus aurea	486	Florida	Bay Biscayne	A. H. Curtiss	Coral			
230. Ficus brevifolia	1204	do	Key Largo	do	do			
231. Ficus pedunculata *Wild Fig. India-rubber Tree.*	508	do	Boca Chica Key	do	do			
232. Morus rubra *Red Mulberry.*	132	Missouri	Allenton	G. W. Letterman	Rich loam			
	433	Tennessee	Nashville	A. Gattinger	do			
233. Morus microphylla *Mexican Mulberry.*	450	New Mexico	Silver City	E. L. Greene	Moist clay	0.078	7	25
	1106	Texas	Austin	S. B. Buckley	Limestone	0.098	4	25
234. Maclura aurantiaca *Osage Orange. Bois d'Arc.*	253	do	Dallas	J. Reverchon	Bottom			
	421	Pennsylvania	West Chester	S. P. Sharples	Clay loam	0.710	3	44
PLATANACEÆ.								
235. Platanus occidentalis *Sycamore. Button Wood. Button-ball Tree. Water Beech.*	21	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.680	35	53
	126	Missouri	Allenton	G. W. Letterman	Rich, alluvial			
	195	Ohio	Miami valley	E. E. Barney	do	4		
236. Platanus racemosa *Sycamore. Button Wood.*	686	California	Carmel river	G. R. Vasey	Clay	0.280	20	
237. Platanus Wrightii *Sycamore.*	648	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Rich, gravelly			
JUGLANDACEÆ.								
238. Juglans cinerea *Butternut. White Walnut.*	16	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.560	5	50
	76[1]	Missouri	Allenton	G. W. Letterman	Rich loam			
	76[2]	do	do	do	Alluvial			
	123	Michigan	Dansville	W. J. Beal	Gravelly clay			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5735	0.5631	.....	0.5683	0.48	0.48	0.48	.....	All sap-wood	758
0.4074	0.5187	.....	0.4906	0.42	0.42	0.42	.....	All sap-wood	918
			0.5294			0.45	32.99		
0.7802	0.7419	.....	0.7611	1.89	1.89	1.89	.....	C. pumila	69
0.6858	.....	.....	0.6858	0.74	.....	0.74	.....	.....	75[1]
0.6592	.....	.....	0.6592	0.68	.....	0.68	.....	.....	75[2]
0.6910	0.7637	.....	0.7274	1.70	1.60	1.65	.....	.....	306
0.8384	0.7956	.....	0.8170	0.97	0.90	0.94	.....	C. Mississippiensis	375
0.7784	0.7186	0.7385	0.7452	1.05	0.75	0.90	.....	.....	864
0.7999	0.7908	0.7604	0.7837	0.89	1.07	0.98	.....	.....	873
0.6570	0.6547	0.6396	0.6504	0.89	0.94	0.92	.....	.....	1111
			0.7287			1.09	45.41		
0.7400	0.7150	.....	0.7275	1.32	1.12	1.22	45.34	.....	652
0.2537	0.2695	.....	0.2616	5.17	4.88	5.03	16.30	.....	486
0.6321	0.6475	.....	0.6398	4.55	4.18	4.36	39.87	.....	1204
0.4680	0.4798	.....	0.4739	4.83	5.00	4.92	29.53	.....	508
0.6242	0.5993	.....	0.6118	0.77	0.60	0.68	.....	.....	132
0.5679	.....	.....	0.5679	0.69	0.78	0.74	.....	.....	433
			0.5898			0.71	36.76		
0.7169	0.7157	.....	0.7163	0.57	0.54	0.56	.....	.....	450
0.8270	0.8262	.....	0.8266	0.70	0.82	0.81	.....	.....	1106
			0.7715			0.68	48.08		
0.7841	0.7495	.....	0.7668	0.87	0.88	0.88	47.78	.....	253
0.8551	0.7054	.....	0.7803	0.38	0.59	0.49	48.63	Cultivated. First sp. gr. determination made on limb-wood; second sp. gr. determination made on root-wood.	421
			0.7736			0.68	48.21		
0.6060	0.6111	.....	0.6086	0.35	0.32	0.33	.....	.....	21
0.6073	0.5748	.....	0.5911	0.47	0.67	0.57	.....	.....	126
0.4986	0.5091	.....	0.5038	0.40	0.57	0.48	.....	.....	195
			0.5078			0.46	35.38		
0.5151	0.4609	.....	0.4880	1.17	1.05	1.11	30.41	.....	686
0.4783	0.4688	.....	0.4736	1.34	1.36	1.35	29.51	Grown at 4,000 feet altitude	648
0.4183	0.4343	.....	0.4263	0.35	0.30	0.33	.....	.....	16
0.4014	0.4005	.....	0.4010	0.49	0.43	0.46	.....	.....	76[1]
0.4633	0.4355	.....	0.4494	0.69	.....	0.69	.....	.....	76[2]
0.3638	.....	.....	0.3638	0.79	.....	0.79	.....	.....	123

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
238. Juglans cinerea—continued	145	Illinois	Waukegan	Robert Douglas	Alluvial			
	176	Ohio	Barney & Smith Manufacturing Co.	E. E. Barney				
	393	Michigan	Lansing	W. J. Beal	Gravelly loam			29
	1057	Massachusetts	Topsfield	J. Robinson	Drift	0.152	8	37
239. Juglans nigra *Black Walnut.*	112	Missouri	Allenton	G. W. Letterman	Alluvial			
	117	Michigan	Dansville	W. J. Beal	Gravelly			
	149	Illinois	Waukegan	Robert Douglas	Loam			
	209	Ohio	Barney & Smith Manufacturing Co.	E. E. Barney				
	318	Michigan	Lansing	W. J. Beal	Loam			
	325	Texas	Dallas	J. Reverchon	Alluvial	0.272	24	84
	407		Charlestown Navy-yard.	S. H. Pook				
	430	Tennessee	Nashville	A. Gattinger	Limestone			
	766	Florida	Aspalaga	A. H. Curtiss	Clay	0.286	8	23
	934	Texas	Austin	C. Mohr	Moist, calcareous			
	951	do	New Braunfels	do	do			
240. Juglans rupestris *Walnut.*	415	New Mexico	Pinos Altos mountains.	E. L. Greene	Alluvial	0.207	15	32
	672	California	Contra Costa county.	G. R. Vasey	do	0.313	11	18
	1227	Arizona	Santa Catalina mountains.	C. G. Pringle				
241. Carya oliveæformis *Pecan. Illinois Nut.*	322[1]	Mississippi	Greenville	C. Mohr	Alluvial	0.260	33	48
	322[2]	do	do	do	do			
	326	Texas	Dallas	J. Reverchon	do			
242. Carya alba *Shell-bark Hickory. Shag-bark Hickory.*	3	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.305	25	37
	29[1]	Kentucky	Danville	W. M. Linney	Shale			
	29[2]	do	do	do	do			
	29[3]	do	do	do	do			
	48	Missouri	Allenton	G. W. Letterman	Upland			
	118[1]	Michigan	Hudson	W. J. Beal	Clay			
	118[2]	do	do	do	do			
	118[3]	do	Lansing	do	do			
	152	Missouri	Allenton	G. W. Letterman	Rich upland			
	249	Virginia	Wytheville	H. Shriver	Clay			
	422	Missouri	Allenton	G. W. Letterman	Alluvial			
	531	Mississippi	Kemper's mill	C. Mohr	do	0.288	28	81
	539	do	do	do	do	0.366	31	102
	816	West Virginia	Grafton	C. G. Pringle	do			
	1056	Massachusetts	Topsfield	J. Robinson	Rich loam	0.250	53	
	1097	Missouri	Allenton	G. W. Letterman	Alluvial			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4394	0.4388	.....	0.4391	0.51	.....	0.51	.....	.....	145
0.3941	0.4023	.....	0.3982	0.44	0.44	0.44	.....	.....	176
0.3379	.....	.....	0.3379	0.43	.....	0.43	.....	.....	393
0.4538	0.4355	0.4698	0.4530	0.41	0.53	0.47	.....	.....	1057
			0.4086			0.51	25.46		
0.5778	0.5881	.....	0.5830	0.63	.....	0.63	.....	.....	112
0.5807	.....	.....	0.5807	0.48	.....	0.48	.....	.....	117
0.5579	0.5559	.....	0.5569	0.12	0.12	0.12	.....	.....	149
0.5025	0.5265	.....	0.5145	0.63	0.49	0.56	.....	.....	209
0.6313	0.6191	.....	0.6252	0.62	.....	0.62	.....	.....	318
0.5608	0.5833	.....	0.5721	1.92	1.99	1.96	.....	.....	325
0.5750	.....	.....	0.5750	0.60	0.69	0.65	.....	.....	407
0.6376	.....	.....	0.6376	0.93	1.05	0.99	.....	.....	430
0.6415 0.6435	0.6363 0.6400	.....	0.6403	0.78 0.51	0.65 0.77	0.68	.....	First sp. gr. determination made on sap-wood	766
0.7830	0.8002	.....	0.7916	1.22	1.64	1.43	.....	First sp. gr. determination made on 0.5 sap-wood	934
0.6609	0.6388	.....	0.6499	0.71	0.57	0.64	.....	.....	951
			0.6115			0.79	38.11		
0.6789	0.6469	0.6753	0.6670	0.57	1.00	0.83	.....	All sap-wood	415
0.6266	0.5611	.....	0.5939	0.85	0.97	0.91	.....	.....	672
0.7258	0.6848	.....	0.7053	1.15	1.42	1.28	.....	.....	1227
			0.6554			1.01	40.85		
0.7390	0.6925	.....	0.7158	0.96	1.18	1.07	.....	Second sp. gr. determination made on 0.5 sap-wood	322[1]
0.7020	0.6982	.....	0.7001	0.93	.....	0.93	.....	Second sp. gr. determination made on 0.5 sap-wood	322[2]
0.7314	0.7445	.....	0.7380	1.33	1.46	1.40	.....	.....	326
			0.7180			1.13	44.75		
0.7618	0.7814	.....	0.7716	0.61	0.58	0.60	.....	All sap-wood	3
0.9680	.....	.....	0.9680	0.73	.....	0.73	.....	All sap-wood	29[1]
0.9205	.....	.....	0.9205	0.86	.....	0.86	.....	All sap-wood	29[2]
0.9859	1.0080	.....	0.9970	0.65	.....	0.65	.....	All sap-wood	29[3]
0.8249	0.8260	.....	0.8255	0.37	0.43	0.40	.....	.....	48
0.8028	.....	.....	0.8028	0.28	.....	0.28	.....	.....	118[1]
0.7974	.....	.....	0.7974	0.66	.....	0.66	.....	.....	118[2]
0.8019	.....	.....	0.8019	1.14	.....	1.14	.....	.....	118[3]
0.8064	0.7677	.....	0.7871	0.87	0.66	0.77	.....	.....	152
0.8470	0.7477	.....	0.7974	0.63	0.93	0.78	.....	All sap-wood	249
0.7289	0.7756	.....	0.7523	0.92	0.90	0.91	.....	.....	422
0.8696	0.9370	.....	0.9033	0.79	0.78	0.79	.....	.....	531
0.8729	0.8692	.....	0.8711	0.78	0.88	0.83	.....	.....	539
0.7470	0.7505	.....	0.7523	0.76	0.66	0.71	.....	.....	816
0.8800	0.9035	0.9245	0.9027	0.54	0.69	0.62	.....	.....	1056
0.6835	0.8051	.....	0.7443	0.90	0.90	0.90	.....	.....	1097
			0.8372			0.73	52.17		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
243. Carya sulcata *Big Shell-bark. Bottom Shell-bark.*	27	Kentucky	Mercer county	W. M. Linney	Limestone			
	91[2]	do	do	do	Alluvial			
	91[3]	do	do	do	do			
	336	Tennessee	Nashville	A. Gattinger	do			
	383	Missouri	Allenton	G. W. Letterman	do			
	391	do	do	do	do			
	1082	do	do	do	do			
	1164	do	do	do	do			
	1165	do	do	do	do			
	1166	do	do	do	do			
	1170	do	do	do	do			
244. Carya tomentosa *Mocker Nut. Black Hickory. Bull Nut. Big-bud Hickory. White-heart Hickory. King Nut.*	52	do	do	do	Rich upland			
	72	Kentucky	Perryville	W. M. Linney	Utica shale			
	254	Missouri	Allenton	G. W. Letterman	Rich upland			
	289	do	do	do	do			
	348	Alabama	Citronelle	C. Mohr	Sandy	0.200	42	31
245. Carya porcina *Pig Nut. Brown Hickory. Black Hickory. Switch-bud Hickory.*	6	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.317	29	55
	51	Missouri	Allenton	G. W. Letterman	Flinty			
	88	do	do	do	Rich loam	0.159	41	6
	121	Michigan	Dansville	W. J. Beal	Gravelly clay			
	288	Missouri	Allenton	G. W. Letterman	Rich loam	0.100	47	13
	442	Tennessee	Nashville	A. Gattinger	Upland			
	538	Alabama	Kemper's mill	C. Mohr	Alluvial	0.354	63	59
	1051	Massachusetts	North Reading	J. Robinson	Drift	0.228	31	42
	1098	Missouri	Allenton	G. W. Letterman	Flinty			
	1168	do	do	do	do			
246. Carya amara *Bitter Nut. Swamp Hickory.*	153	do	do	do	Rich upland			
	401	do	do	do	do			
	838	Massachusetts	Danvers	J. Robinson	Rich loam			
	871	do	do	do	do	0.115	18	19
247. Carya myristicæformis *Nutmeg Hickory.*	237	South Carolina	Bonneau's Depot	H. W. Ravenel	Rich, swampy	0.402	7	107
248. Carya aquatica *Water Hickory. Swamp Hickory. Bitter Pecan.*	129	do	do	do	Swampy			
	362	Mississippi	Vicksburg	C. Mohr		0.277	28	18
	740	Georgia	Bainbridge	A. H. Curtiss	Alluvial			
	917	Florida	Chattahoochee	C. Mohr	do	0.262	23	28

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8791	0.8767	.....	0.8779	0.72	0.70	0.71	.....	.....	27
0.7527	0.6859	.....	0.7193	1.09	.....	1.09	.....	.....	91[1]
0.7345	.....	.....	0.7345	1.04	.....	1.04	.....	.....	91[2]
0.7654	.....	.....	0.7654	.....	.....	.....	.....	.....	336
0.8020	0.8610	.....	0.8815	0.99	0.92	0.96	.....	First sp. gr. determination made on 0.5 sap-wood	383
0.8512	0.8424	.....	0.8468	0.91	1.24	1.07	.....	.....	391
0.8911	0.9061	0.8831	0.8934	0.83	0.90	0.87	.....	All sap-wood	1082
0.8827	0.8854	.....	0.8840	0.81	0.84	0.83	.....	.....	1164
0.7054	0.6898	0.7414	0.7122	0.73	0.72	0.73	.....	.....	1165
0.8508	0.8432	.....	0.8470	0.90	0.95	0.93	.....	0.5 sap-wood	1166
0.8024	0.7275	0.7389	0.7563	0.84	0.71	0.78	.....	.....	1170
			0.8108			0.99	50.53		
0.8524	0.8168	.....	0.8346	0.97	0.84	0.91	.....	.....	52
0.8610	0.8709	.....	0.8660	1.02	1.06	1.04	.....	0.5 sap-wood	72
0.8334	0.8500	.....	0.8417	0.72	1.05	0.89	.....	Second sp. gr. determination made on sap-wood; second growth	254
.....	0.7279	.....	0.7279	1.29	1.65	1.47	.....	.....	289
0.8316	0.8462	.....	0.8389	0.99	1.03	1.01	.....	First sp. gr. determination made on 0.5 sap-wood; second sp. gr. determination made on sap-wood.	348
			0.8218			1.06	51.21		
0.8157	0.8139	.....	0.8148	0.60	0.60	0.60	.....	.....	6
0.8827	.....	.....	0.8827	1.25	1.40	1.33	.....	.....	51
0.9189	0.9290	.....	0.9240	0.85	0.85	0.85	.....	Second sp. gr. determination made on sap-wood; second growth	88
0.6803	.....	.....	0.6803	1.58	.....	1.58	.....	.....	121
0.8554	0.8530	.....	0.8542	0.83	0.71	0.77	.....	First sp. gr. determination made on sap-wood; second sp. gr. determination made on 0.9 sap-wood.	288
0.7926	.....	.....	0.7926	0.68	0.70	0.69	.....	All sap-wood	442
0.8530	0.7152	.....	0.7841	0.82	0.86	0.84	.....	First sp. gr. determination made on 0.8 sap-wood; second sp. gr. determination made on sap-wood.	538
0.8842	0.8481	0.8537	0.8620	0.74	0.75	0.75	.....	Third sp. gr. determination made on sap-wood	1051
0.8990	0.7640	.....	0.8315	1.27	1.29	1.28	.....	Second sp. gr. determination made on sap-wood	1098
0.7470	0.7355	0.8913	0.7913	1.15	1.19	1.17	.....	All sap-wood	1168
			0.8217			0.99	51.21		
0.7814	0.7830	.....	0.7822	1.00	0.97	0.99	.....	.....	153
0.5927	0.5754	.....	0.5841	0.97	0.93	0.95	.....	.....	401
0.7530	0.7142	.....	0.7336	0.94	1.03	0.99	.....	.....	836
0.9208	.....	.....	0.9208	1.42	0.92	1.17	.....	0.5 sap-wood	871
			0.7552			1.03	47.06		
0.7919	0.8112	.....	0.8016	1.07	1.05	1.06	49.96	All sap-wood	237
0.7639	0.7332	.....	0.7486	1.31	2.03	1.67	.....	All sap-wood	129
0.7719	0.7700	.....	0.7710	1.05	1.32	1.19	.....	0.5 sap-wood	362
0.8248	0.8244	.....	0.8246	1.32	1.05	1.19	.....	0.5 sap-wood	740
0.6422	0.6313	0.5821	0.6185	0.91	1.17	1.04	.....	0.5 sap-wood	917
			0.7407			1.27	46.16		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
MYRICACEÆ.								
249. Myrica cerifera. *Bayberry. Wax Myrtle.*	586	Florida	Saint John's river	A. H. Curtiss	Sandy loam	0.198	18	22
250. Myrica Californica	665	California	Santa Cruz	G. Engelmann and C. S. Sargent.	Rich loam			
CUPULIFERÆ.								
251. Quercus alba. *White Oak.*	8	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.560	12	88
	26	do	Acushnet	E. A. Dana				
	32[1]	Kentucky	Mercer county	W. M. Linney	Limestone			
	32[2]	do	Boyle county	do	Slate			
	32[3]	do	do	do	Shale			
	49[1]	Missouri	Allenton	G. W. Letterman	Rich upland			
	49[2]	do	do	do	do			
	49[3]	do	do	do	do			
	113[1]	Michigan	Big Rapids	W. J. Beal	Gravelly	0.374	34	18
	113[2]	do	Dansville	do	Sandy			
	113[3]	do	Hudson	do				
	150	Illinois	Waukegan	Robert Douglas	Gravelly clay			
	169	Ohio	Pineo, Daniels & Co.	E. E. Barney				
	196	do	Barney & Smith Manufacturing Co.	do				
	228[1]	Vermont	Champlain valley	C. G. Pringle	Clay			
	228[2]	do	Charlotte	do	Gravelly loam			
	228[3]	do	do	do	do			
	238	South Carolina	Bonneau's Depot	H. W. Ravenel	Rich, damp loam			
	250	Virginia	Wytheville	H. Shriver	Clay			
	251	do	do	do		0.225	56	
	259[1]	do	do	do	Gravelly			
	259[2]	do	do	do	do			
	259[3]	do	do	do	do			
	403	Maryland	Charlestown Navy-yard.	S. H. Pook				
	443	Tennessee	Nashville	A. Gattinger	Rich bottom			
	547	Alabama	Kemper's mill	C. Mohr	Alluvial			
	748	Florida	Chattahoochee	A. H. Curtiss	Clay	0.236	8	48
	749	do	do	do	do	0.248	13	74
	895	Massachusetts		M. C. Beedle				
	1050	do	North Reading	J. Robinson		0.203	7	11
	1257		Charlestown Navy-yard.	S. H. Pook				
252. Quercus lobata. *White Oak. Weeping Oak.*	670	California	Redding	G. R. Vasey	Gravelly loam	0.356	15	17
253. Quercus Garryana. *White Oak.*	985	Oregon	Weidler's saw-mill	G. Engelmann and C. S. Sargent.				
	988	do	Portland	do	Rich loam	0.393	30	82
	1027	do	Portland Furniture Company.	do				
	1029	do	do	do				
254. Quercus obtusiloba. *Post Oak. Iron Oak.*	37[1]	Kentucky	Harrodsburg	W. M. Linney	Shale			
	37[2]	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5639 0.5723	0.5592 0.5519	0.5711	0.5637	0.54 0.47	.....	0.51	35.13	.....	586
0.6793	0.6613	.....	0.6703	0.33	0.33	0.33	41.77	.....	665
0.7165	0.7093	.....	0.7129	0.37	0.31	0.34	.....	.....	8
0.7970	0.8012	.....	0.7991	0.30	0.25	0.28	.....	.....	26
0.8480	0.8451	0.7965	0.8299	0.45	0.47	0.46	.....	.....	32[1]
0.6328	.....	.....	0.6328	.....	.....	.....	.....	.....	32[2]
0.6305	.....	.....	0.6305	.....	.....	.....	.....	.....	32[3]
0.6965	0.6526	.....	0.6746	0.37	0.43	0.40	.....	.....	49[1]
0.7826	.....	.....	0.7826	0.45	.....	0.45	.....	.....	49[2]
0.6829	0.7385	.....	0.7107	0.30	.....	0.30	.....	.....	49[3]
0.6006	.....	.....	0.6006	0.37	.....	0.37	.....	.....	113[1]
0.6852	0.7012	.....	0.6932	0.41	.....	0.41	.....	.....	113[2]
0.7017	.....	.....	0.7017	0.24	.....	0.24	.....	.....	113[3]
0.7892	0.8735	.....	0.8314	0.47	0.42	0.45	.....	.....	150
0.7672	.....	.....	0.7672	0.21	0.23	0.22	.....	.....	169
0.6203	0.6305	.....	0.6254	0.57	0.65	0.61	.....	.....	196
0.8304	.....	.....	0.8304	0.39	.....	0.39	.....	.....	228[1]
0.8670	.....	.....	0.8670	0.33	.....	0.33	.....	.....	228[2]
0.8091	.....	.....	0.8091	0.37	.....	0.37	.....	.....	228[3]
0.7830	0.7391	.....	0.7611	0.43	0.42	0.43	.....	.....	238
0.7874	0.7419	.....	0.7647	0.35	0.33	0.34	.....	.....	250
0.6848	0.6984	.....	0.6916	0.21	0.25	0.23	.....	.....	251
0.7556	.....	.....	0.7556	.....	.....	.....	.....	.....	259[1]
0.7069	.....	.....	0.7069	0.30	.....	0.30	.....	.....	259[2]
0.8056	.....	.....	0.8056	0.37	.....	0.37	.....	.....	259[3]
0.7390	0.7437	.....	0.7414	0.49	0.44	0.47	.....	.....	403
0.6549	.....	.....	0.6549	1.37	1.64	1.51	.....	.....	443
0.8566	0.7794	.....	0.8180	0.45	0.29	0.37	.....	.....	547
0.7732	0.7562	.....	0.7647	0.47	0.50	0.49	.....	Brash: rough bark	748
0.8066	0.8228	.....	0.8147	0.34	0.31	0.33	.....	Tough: smooth bark	749
0.7672	0.7734	.....	0.7703	0.33	0.37	0.35	.....	Taken from beam in old court-house at Cambridge, built in 1757	895
0.8065	0.7584	0.7358	0.7669	0.26	0.22	0.24	.....	.....	1050
.....	.....	.....	0.8439	.....	.....	.....	.....	.....	1257
			0.7470			0.41	46.35		
0.7349	0.7672	0.6706	0.7409	0.25	0.34	0.30	46.17	Third sp. gr. determination made on sap-wood	670
0.7814	0.8425	.....	0.8120	0.33	0.25	0.29	.....	.....	985
0.6549	0.7600	.....	0.7075	0.33	0.33	0.33	.....	.....	988
0.7478	0.7574	0.7704	0.7585	0.37	0.41	0.39	.....	Brash	1027
0.6698	0.7369	.....	0.7034	0.62	0.49	0.56	.....	Tough	1029
			0.7453			0.39	46.45		
0.8200	0.8008	.....	0.8104	0.62	.....	0.62	.....	Second sp. gr. determination made on 0.5 sap-wood	37[1]
0.8765	.....	.....	0.8765	0.74	.....	0.74	.....	0.5 sap-wood	37[2]

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
254. Quercus obtusiloba—continued	37[3]	Kentucky	Harrodsburg	W. M. Linney	Shale			
	151	South Carolina	Bonneau's Depot	H. W. Ravenel	Rich upland			
	256	Missouri	Allenton	G. W. Letterman	Clay			
	351	Alabama	Citronelle	C. Mohr	do	0.244	38	88
	771	Florida	Aspalaga	A. H. Curtiss	Gravelly barrens	0.264	32	115
255. Quercus undulata, *var.* Gambelii *Scrub Oak.*	295	New Mexico	Pinos Altos mountains.	E. L. Greene		0.196	18	67
	417	do	do	do				
	525	Colorado	Engelmann's cañon	Robert Douglas	Rocky			
	1150	Arizona	Santa Rita mountains.	C. G. Pringle				
256. Quercus macrocarpa *Burr Oak. Mossy-cup Oak. Over-cup Oak.*	79[1]	Kentucky	Mercer county	W. M. Linney	Alluvial			
	79[2]	do	do	do	do			
	79[3]	do	do	do	do			
	79[4]	do	do	do	do			
	137	Missouri	Allenton	G. W. Letterman	Moist upland			
	143	Illinois	Waukegan	Robert Douglas	Rich			
	168	Ohio	Woodsum Machine Company.	E. E. Barney				
	204	do	Barney & Smith Manufacturing Co.	do				
	310	Texas	Dallas	J. Reverchon	Rich, moist	0.528	13	120
	400	Missouri	Allenton	G. W. Letterman	Alluvial			
	412	Vermont	Charlotte	C. G. Pringle	Clay			
	432	Tennessee	Nashville	A. Gattinger	Alluvial			
	583	Illinois	Waukegan	Robert Douglas				
	831	do	Winnebago county	M. S. Bebb	Loam			
	832	do	do	do	do			
	933	Texas	Austin	C. Mohr	Alluvial			
	1071	Vermont	Charlotte	C. G. Pringle				
	1072	do	do	do				
	1073	do	do	do				
257. Quercus lyrata *Over-cup Oak. Swamp Post Oak. Water White Oak.*	424	Tennessee	Nashville	A. Gattinger	Low			
	545	Mississippi	Kemper's mill	C. Mohr	Alluvial	0.339	19	73
	762	Florida	Chattahoochee	A. H. Curtiss	do	0.266	20	70
	953	Texas	Matagorda bay	C. Mohr	Loam			
258. Quercus bicolor *Swamp White Oak.*	12	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.305	8	60
	54[1]	Missouri	Allenton	G. W. Letterman	Alluvial			
	54[2]	do	do	do	do			
	54[3]	do	do	do	do			
	846	Massachusetts	West Newbury	J. Robinson	Low, swampy	0.206	5	80

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8450	.....	.....	0.8450	1.50	.....	1.50	.....	.....	37[5]
0.8920	0.8882	0.9170	0.8991	0.79	0.79	0.79	.....	.....	151
0.8522	0.8196	.....	0.8359	0.46	0.52	0.49	.....	.....	256
0.7888	0.7516	.....	0.7702	0.52	0.53	0.53	.....	.....	351
0.8548	0.7942	0.8072	0.8187	0.63	0.88	0.76	.....	.....	771
			0.8367			0.70	52.14		
0.8382	0.8562	.....	0.8472	.....	.....	.....	.....	.....	205
0.8680	0.7748	0.7862	0.8097	0.78	0.79	0.79	.....	First sp. gr. determination made on 0.75 sap-wood	417
0.7664	0.7894	.....	0.7780	1.08	1.37	1.23	.....	.....	525
0.9187	0.9052	.....	0.9270	1.10	0.80	0.95	.....	.....	1150
			0.8407			0.90	52.39		
0.7070	.....	.....	0.7070	0.96	.....	0.96	.....	.....	79[1]
0.7205	.....	.....	0.7205	0.66	.....	0.66	.....	.....	79[2]
0.7275	0.7275	.....	0.7275	0.70	.....	0.70	.....	.....	79[3]
0.6426	0.6300	.....	0.6363	1.18	.....	1.18	.....	.....	79[4]
0.8469	.....	.....	0.8469	0.41	0.37	0.39	.....	Second growth	137
0.8280	0.8276	.....	0.8278	0.60	0.92	0.76	.....	.....	143
0.6440	0.6389	.....	0.6416	0.31	0.32	0.32	.....	.....	168
0.6158	0.6177	.....	0.6318	0.37	0.43	0.40	.....	.....	204
0.7722	0.8166	.....	0.7944	1.08	1.03	1.06	.....	.....	310
0.6183	0.6411	.....	0.6297	0.60	0.60	0.60	.....	.....	400
0.8630	0.8496	.....	0.8563	0.26	0.27	0.27	.....	.....	412
0.7271	.....	.....	0.7271	0.74	0.75	0.75	.....	.....	432
0.9220	0.9543	0.9300	0.9387	1.18	1.46	1.32	.....	.....	583
0.6842	0.7112	.....	0.6977	0.78	0.70	0.74	.....	From fence-post 6 years in the ground	831
0.6107	0.7075	.....	0.6591	0.98	0.93	0.96	.....	Old fence-post	832
0.7605	0.8402	0.8047	0.8018	1.11	1.18	1.15	.....	.....	933
0.7740	0.8087	0.7300	0.7720	0.45	0.46	0.46	.....	.....	1071
0.7845	0.7924	0.8018	0.7920	0.32	0.45	0.39	.....	.....	1073
0.7508	0.7630	0.7317	0.7515	0.44	0.35	0.40	.....	.....	1073
			0.7453			0.71	46.45		
0.8060	0.7863	.....	0.7962	0.59	0.56	0.58	.....	.....	424
0.7802	0.7502	.....	0.7652	0.22	0.23	0.23	.....	.....	545
0.8050	0.7040	.....	0.7850	0.23	0.18	0.21	.....	.....	762
0.9700	.....	.....	0.9700	1.72	1.44	1.58	.....	.....	953
			0.8313			0.65	51.81		
0.7552	0.7315	.....	0.7434	0.26	0.28	0.27	.....	.....	32
0.8616	0.8628	.....	0.8622	0.39	.....	0.39	.....	.....	54[1]
0.6833	.....	.....	0.6833	0.98	.....	0.98	.....	.....	54[2]
0.7114	.....	.....	0.7114	0.98	.....	0.98	.....	.....	54[3]
0.8404	0.8186	0.8330	0.8307	0.27	0.31	0.29	.....	.....	846
			0.7662			0.58	47.75		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
259. Quercus Michauxii *Basket Oak. Cow Oak.*	240	South Carolina	Bonneau's Depot	H. W. Ravenel	Alluvial			
	524	Alabama	Kemper's mill	C. Mohr	do	0.322	22	69
	755	Florida	Chattahoochee	A. H. Curtiss	do	0.260	12	32
260. Quercus Prinus *Chestnut Oak. Rock Chestnut Oak.*	31[1]	Kentucky	Boyle county	W. M. Linney	Shale			
	31[2]	do	do	do	do			
	31[3]	do	do	do	do			
	35	do	do	do	Limestone			
	434	Tennessee	Nashville	A. Gattinger	Rocky upland			
	925	Alabama	Cullman	C. Mohr	Dry, rocky	0.436	34	84
261. Quercus prinoides *Yellow Oak. Chestnut Oak. Chinquapin Oak.*	28	Kentucky	Harrodsburg	W. M. Linney				
	34[1]	do	Mercer county	do	Limestone			
	34[2]	do	Boyle county	do	Waverly shale			
	34[3]	do	Mercer county	do	Utica shale			
	58	Missouri	Allenton	G. W. Letterman	Poor, hilly			
	278	do	do	do	Limestone			
	287	do	do	do	Flinty			
	323	Texas	Dallas	J. Reverchon	Calcareous	0.226	24	35
	514	Tennessee	Nashville	A. Gattinger	Alluvial			
	588	Texas	Dallas	J. Reverchon	do			
	856	Massachusetts	Boxford	J. Robinson	Damp	0.364	10	123
262. Quercus Douglasii *Mountain White Oak. Blue Oak.*	688	California	Contra Costa county	G. R. Vasey	Clay	0.338	59	
263. Quercus oblongifolia *White Oak.*	601	do	San Diego county	do	Dry, gravelly			
	700	do	San Gabriel	G. Engelmann	do	0.202	16	5
264. Quercus grisea *White Oak.*	419	New Mexico	Silver City	E. L. Greene	Dry, rocky	0.212	38	40
	698	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	do			
	1145	do	do	C. G. Pringle	do			
265 Quercus reticulata	1148	do	do	do	do			
266. Quercus Durandii	935	Texas	Austin	C. Mohr	Damp, calcareous.	0.164	24	39
	1103	do	do	S. B. Buckley	do			
267. Quercus virens *Live Oak.*	404	Florida	Charlestown Navy-yard.	S. H. Pook				
	799	do	Saint John's river	A. H. Curtiss	Sandy	0.238	39	15

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7074	0.8312	.....	0.7693	0.33	0.48	0.40	.....	.....	240
0.8253	0.7704	.....	0.7979	0.57	0.57	0.57	.....	.....	524
0.8200	0.8090	.....	0.8145	0.38	0.35	0.37	.....	.....	755
			0.8039			0.45	59.10		
0.7126	0.7102	.....	0.7114	0.36	.....	0.36	.....	.....	81[1]
0.6549	0.6659	.....	0.6604	0.33	.....	0.33	.....	.....	81[2]
0.7726	.....	.....	0.7726	.....	.....	.....	.....	.....	81[3]
0.8308	.....	.....	0.8308	0.70	0.87	0.79	.....	.....	35
0.6870	.....	.....	0.6870	1.94	1.93	1.94	.....	.....	434
0.8550	0.8185	.....	0.8368	0.40	0.49	0.45	.....	.....	925
			0.7499			0.77	46.73		
0.8401	0.8419	.....	0.8410	1.50	1.40	1.45	.....	.....	28
0.7051	.....	.....	0.7051	1.49	.....	1.49	.....	.....	34[1]
0.8712	.....	.....	0.8712	0.39	0.49	0.44	.....	.....	34[2]
0.9043	.....	.....	0.9043	1.62	.....	1.62	.....	.....	34[3]
0.6560	0.6525	.....	0.6546	1.39	1.25	1.32	.....	.....	58
0.9237	0.8548	.....	0.8893	1.16	1.31	1.24	.....	.....	273
0.8248	0.8644	.....	0.8446	0.64	0.57	0.61	.....	.....	287
1.0240	1.0728	.....	1.0484	1.25	1.09	1.17	.....	.....	323
0.8592	0.8750	.....	0.8671	1.43	1.49	1.46	.....	.....	514
0.9183	0.9405	.....	0.9294	1.38	1.22	1.30	.....	.....	588
0.7652	0.7458	0.7706	0.7605	0.43	0.43	0.43	.....	.....	856
			0.8605			1.14	53.63		
0.9958	0.7898	.....	0.8928	0.80	0.88	0.84	55.64	Second sp. gr. determination made on sap-wood	688
1.0078 0.9495	1.0799 1.1500	1.0169 1.0882	1.0486	4.02 2.28	4.69 4.08	4.07	.....	First and second sp. gr. determinations made on sap-wood	601
0.8420	0.8374	.....	0.8397	0.99	1.31	1.15	.....	All sap-wood	700
			0.9441			2.61	58.84		
0.9171	0.9835	0.8703	0.9236	1.22	1.26	1.24	.....	0.5 sap-wood	419
0.9897	.....	.....	0.9897	2.57	3.33	2.95	.....	0.5 sap-wood	698
1.1340	1.0945	.....	1.1143	1.32	1.19	1.26	.....	.....	1145
			1.0092			1.82	62.89		
0.9430	0.9528	.....	0.9479	0.51	0.53	0.52	59.07	.....	1148
0.9762 0.8048	0.8000 0.8000	.....	0.8775	1.71 1.80	.....	1.75	.....	0.5 sap-wood	935
0.9640	1.0835	.....	1.0238	1.82	.....	1.82	.....	.....	1103
			0.9507			1.78	59.25		
1.0350	.....	.....	1.0350	.....	.....	.....	.....	.....	404
0.9005	0.8940	.....	0.8977	1.23	1.21	1.22	.....	.....	709

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH. Sap-wood.	Heart-wood.
267. Quercus virens—continued	919	Alabama	Mobile county	C. Mohr	Rich, sandy			
	954	Texas	Matagorda bay	do	Sandy loam			
268. Quercus chrysolepis *Live Oak. Maul Oak. Valparaiso Oak.*	574	Oregon	Saw-mill, Ashland	G. Engelmann and C. S. Sargent.				
	649	California	San Bernardino	W. G. Wright				
	653	do	Marin county	G. R. Vasey	Gravelly			
269. Quercus Emoryi *Black Oak.*	594	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Dry, rocky			
270. Quercus agrifolia *Encino Coast Live Oak.*	663	California	Marin county	G. R. Vasey	Loam	0.247		
271. Quercus Wislizeni *Live Oak.*	677	do	Auburn	G. Engelmann				
272. Quercus rubra *Red Oak. Black Oak.*	7	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.534	8	73
	45[1]	Kentucky	Mercer county	W. M. Linney	Shale			
	45[2]	do	do	do	do			
	89	Missouri	Allenton	G. W. Letterman	Rich loam	0.149	5	40
	92[1]	Kentucky	Mercer county	W. M. Linney	Alluvial			
	92[4]	do	do	do	Limestone			
	140	Michigan	Dansville	W. J. Beal	Sandy			
	141	do	do	do	do			
	146	Illinois	Waukegan	Robert Douglas	Gravelly			
	197	Ohio	Barney & Smith Manufacturing Co.	E. E. Barney				
	215	Vermont	Charlotte	C. G. Pringle	Gravelly			
	216	do	do	do	do			
	217	do	do	do	do			
	218	do	do	do	do			
	553	Alabama	Komper's mill	C. Mohr	Alluvial	0.368	38	97
	866	Massachusetts	Danvers	J. Robinson	Drift			
	920	Mississippi	Enterprise	C. Mohr	Alluvial			
	1043	Massachusetts	North Reading	J. Robinson	Drift	0.230	6	27
272. Quercus rubra, *var.* Texana *Red Oak.*	931	Texas	Austin	C. Mohr	Calcareous	0.118	13	20
273. Quercus coccinea *Scarlet Oak.*	23	Massachusetts	Hingham	T. T. Bouvé	Light, sandy			
	752	Florida	Aspalaga	A. H. Curtiss	Clay	0.230	15	
274. Quercus tinctoria *Black Oak. Yellow-bark Oak. Quercitron Oak. Yellow Oak.*	17	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.630	8	74
	36[1]	Kentucky	Danville Junction	W. M. Linney	Shale			
	36[2]	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.8225	0.9330	.....	0.8778	1.25	1.30	1.27	.....	.....	919
1.0090	0.9709	.....	0.9900	1.09	0.76	0.93	.....	0.33 sap-wood	954
			0.9501			1.14	59.21		
0.7888	0.7592	.....	0.7740	0.80	0.62	0.71	.....	.....	574
0.8830	0.8827	.....	0.8829	0.33	0.34	0.34	.....	.....	649
0.8787	0.9033	.....	0.8910	0.73	0.79	0.76	.....	.....	653
			0.8493			0.60	52.93		
0.9975 / 0.9201	0.9019 / 0.8855	.....	0.9263	1.86 / 2.61	2.10 / 2.78	2.36	57.73	Second sp. gr. determination made on sap-wood	594
0.8290	0.8216	.....	0.8253	1.21	1.34	1.28	51.43	.....	663
0.7956 / 0.8018	0.7788 / 0.7657	.....	0.7855	0.94 / 0.96	0.98 / 1.18	1.02	48.95	.....	677
0.6381	0.6440	.....	0.6411	0.14	0.10	0.12	.....	.....	7
0.5186	0.5910	.....	0.5548	0.46	.....	0.46	.....	.....	45[1]
0.5169	0.6251	.....	0.5710	0.43	.....	0.43	.....	.....	45[2]
0.7480	.....	.....	0.7480	0.27	.....	0.27	.....	.....	89
0.5899	.....	.....	0.5899	0.47	0.47	0.47	.....	.....	92[1]
0.7516	0.7512	0.7516	0.7515	0.15	.....	0.15	.....	.....	92[4]
0.6410	.....	.....	0.6410	0.20	0.21	0.21	.....	.....	140
0.5952	.....	.....	0.5952	0.23	0.24	0.24	.....	.....	141
0.7481	0.7514	.....	0.7498	0.22	0.31	0.27	.....	.....	146
0.6516	0.6615	.....	0.6566	0.16	0.17	0.17	.....	.....	197
0.6423	0.6997	.....	0.6710	0.27	0.22	0.25	.....	.....	215
0.6897	0.7090	.....	0.6994	0.20	0.24	0.22	.....	.....	216
0.6669	0.6867	.....	0.6768	0.20	0.26	0.23	.....	Second growth from stump	217
0.6765	0.7029	.....	0.6897	0.33	0.32	0.33	.....	.....	218
0.6389	0.6589	.....	0.6489	0.37	0.34	0.36	.....	.....	553
0.6636	0.6252	0.6573	0.6487	0.07	0.14	0.11	.....	.....	866
0.5244	0.5604	.....	0.5424	0.25	0.21	0.23	.....	.....	920
0.7130	0.6806	0.6920	0.6952	0.14	0.19	0.17	.....	.....	1043
			0.6540			0.26	40.75		
0.9142	0.9018	.....	0.9080	0.93	0.76	0.85	56.59	0.5 sap-wood	931
0.7111	0.7079	.....	0.7095	0.11	0.16	0.14	.....	.....	23
0.7667	0.7762	.....	0.7715	0.22	0.28	0.25	.....	.....	752
			0.7405			0.19	46.15		
0.7364	0.7305	.....	0.7335	0.13	0.08	0.11	.....	.....	17
0.6863	.....	.....	0.6863	0.21	.....	0.21	.....	.....	36[1]
0.7205	.....	.....	0.7205	0.31	.....	0.31	.....	.....	36[2]

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
274. Quercus tinctoria—continued	36[3]	Kentucky	Danville Junction	W. M. Linney	Slate			
	41	Missouri	Allenton	G. W. Letterman	Hilly			
	74	do	do	do	Rich upland	0.165	6	16
	86	do	do	do	do			
	244	Virginia	Wytheville	H. Shriver	Clay			
	247	do	do	do	do			
	437	Tennessee	Nashville	A. Gattinger	do			
	921	Alabama	Cullman	C. Mohr	Sandy			
275. Quercus Kelloggii *Black Oak.*	628	Oregon	Saw-mill, Ashland	G. Engelmann and C. S. Sargent.				
	963	do	Eugene City	G. H. Collier		0.224	17	78
276. Quercus nigra *Black Jack. Jack Oak.*	268	Missouri	Allenton	G. W. Letterman	Clay			
	339	Alabama	Citronelle	C. Mohr	Sandy	0.128	13	46
277. Quercus falcata *Spanish Oak. Red Oak.*	131	South Carolina	Bonneau's Depot	H. W. Ravenel	Rich loam			
	245	Virginia	Wytheville	H. Shriver	Clay			
	265[1]	do	Carroll county	do	do			
	265[2]	do	do	do				
	265[3]	do	do	do				
	548	Mississippi	Kemper's mill	C. Mohr	Rich loam			
278. Quercus Catesbæi *Turkey Oak. Scrub Oak. Forked-leaf Black Jack. Black Jack.*	342	Alabama	Cottage Hill	do	Barren, sandy			
	770	Florida	Aspalaga	A. H. Curtiss	do	0.301	62	
279. Quercus palustris *Pin Oak. Swamp Spanish Oak. Water Oak.*	47	Missouri	Allenton	G. W. Letterman	Rich, alluvial			
	282	do	do	do	do			
280. Quercus aquatica *Water Oak. Duck Oak. Possum Oak. Punk Oak.*	349	Alabama	Cottage Hill	C. Mohr	Sandy loam	0.350	8	16
	511	Tennessee	Tullahoma	A. Gattinger	do			
	742	Georgia	Bainbridge	A. H. Curtiss	Alluvial	0.310	13	23
281. Quercus laurifolia *Laurel Oak.*	756	Florida	Saint John's river	do	Sandy loam			
	801	do	do	do	do	0.240	33	26
282. Quercus heterophylla *Bartram's Oak.*	1171	New Jersey	Mount Holly	S. P. Sharples	Clay	0.329	6	19
283. Quercus cinerea *Upland Willow Oak. Blue Jack. Sand Jack*	352	Alabama	Citronelle	C. Mohr	Pine-barren			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7749	.....	.....	0.7749	0.18	.....	0.18	.....	.....	36[3]
0.7596	0.7352	.....	0.7474	0.17	0.14	0.16	.....	.....	41
0.8014	.....	.....	0.8014	0.22	0.19	0.21	.....	0.33 sap-wood; second growth	74
0.7192	.....	.....	0.7192	0.28	0.18	0.23	.....	.....	86
0.5070	0.5175	.....	0.5123	0.44	0.63	0.54	.....	.....	244
0.7164	0.6586	.....	0.6875	0.14	0.15	0.15	.....	.....	247
0.6765	.....	.....	0.6765	0.35	0.37	0.36	.....	.....	437
0.6622	0.6972	0.7100	0.6898	0.59	0.70	0.65	.....	.....	921
			0.7045			0.28	43.90		
0.6565	0.6582	.....	0.6573	0.18	0.21	0.20	.....	.....	628
0.6273	0.6322	.....	0.6297	0.33	0.30	0.32	.....	.....	963
			0.6435			0.26	40.10		
0.7304	0.7492	.....	0.7398	0.96	0.92	0.94	.....	.....	268
0.7309	0.7192	.....	0.7251	1.41	1.32	1.37	.....	All sap-wood	339
			0.7324			1.16	45.64		
0.6892	0.7003	.....	0.6948	0.27	0.27	0.27	.....	.....	131
0.5701	0.6780	.....	0.6241	0.27	0.33	0.30	.....	.....	245
0.6613	.....	.....	0.6613	0.15	.....	0.15	.....	.....	265[1]
0.7334	.....	.....	0.7334	0.22	.....	0.22	.....	.....	265[2]
0.6556	.....	.....	0.6556	0.25	.....	0.25	.....	.....	265[3]
0.8052	0.7696	.....	0.7874	0.29	0.28	0.29	.....	.....	548
			0.6928			0.25	43.17		
0.6679	0.6736	.....	0.6708	0.85	0.80	0.83	.....	.....	342
0.7906	0.7854	.....	0.7880	0.90	0.90	0.90	.....	.....	770
			0.7294			0.87	45.45		
0.6917	0.6465	.....	0.6691	0.65	0.57	0.61	.....	.....	47
0.7480	0.6890	.....	0.7185	0.92	1.07	1.00	.....	Second growth	282
			0.6938			0.81	43.24		
0.7167	0.7149	.....	0.7158	0.45	0.39	0.42	.....	.....	349
0.7084	0.7202	.....	0.7143	0.82	0.84	0.83	.....	.....	511
0.7237	0.7624	.....	0.7431	0.35	0.19	0.27	.....	.....	742
			0.7244			0.51	45.14		
0.7474	0.7075	.....	0.7275	0.48	0.46	0.47	.....	All sap-wood	756
0.8146	0.7995	.....	0.8071	0.93	1.41	1.17	.....	.....	801
			0.7673			0.82	47.82		
0.6818 / 0.6882	0.6834 / 0.6802	.....	0.6834	0.19	0.14	0.17	42.59	.....	1171
0.6502	0.6337	.....	0.6420	1.27	1.15	1.21	40.00	.....	352

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
284. Quercus hypoleuca	416	New Mexico	Pinos Altos mountains.	E. L. Greene	Dry, rocky	0.203	49	20
	599	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	do			
285. Quercus imbricaria *Shingle Oak. Laurel Oak.*	40[1]	Kentucky	Harrodsburg	W. M. Linney	Utica shale			
	40[2]	do	do	do	do			
	40[3]	do	do	do	do			
	50	Missouri	Allenton	G. W. Letterman	Rich, moist			
	135	do	do	do	Rich loam			
286. Quercus Phellos *Willow Oak. Peach Oak.*	512	Tennessee	Tullahoma	A. Gattinger	Moist, siliceous	0.184	15	
287. Quercus densiflora *Tanbark Oak. Chestnut Oak. Peach Oak.*	687	California	Marin county	G. R. Vasey	Gravelly	0.400	25	85
288. Castanopsis chrysophylla *Chinquapin.*	729	do	Mendocino county	A. Kellogg				
289. Castanea pumila *Chinquapin.*	573	Arkansas	Hot Springs	G. W. Letterman	Sandy loam	0.615		
290. Castanea vulgaris, *var.* Americana *Chestnut.*	18	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.666	34	42
	258[1]	Virginia	Fancy Gap	H. Shriver	Moist			
	258[2]	do	do	do	do			
	258[3]	do	do	do	do			
	516	Tennessee	Nashville	A. Gattinger	Sandy			
	727	Pennsylvania	Williamsport	C. G. Pringle				
	868	Massachusetts	Danvers	J. Robinson	Loam	0.110	4	21
291. Fagus ferruginea *Beech.*	9	do	Arnold Arboretum	C. S. Sargent	Drift	0.190	9	26
	44[2]	Kentucky	Mercer county	W. M. Linney	Hudson River shale.			
	44[3]	do	do	do	do			
	55[3]	do	do	do	do			
	55[4]	do	do	do	do			
	119	Michigan	Dansville	W. J. Beal	Gravelly			
	765	Florida	Chattahoochee	A. H. Curtiss	do	0.272	82	
	853	Massachusetts	Hamilton	J. Robinson	do			
292. Ostrya Virginica *Hop Hornbeam. Iron Wood. Lever Wood.*	11	do	Arnold Arboretum	C. S. Sargent	Drift	0.285	26	44
	87	Missouri	Allenton	G. W. Letterman	Rich loam	0.085	35	
	870	Massachusetts	Danvers	J. Robinson	Rocky			
	877	do	do	do	Rich loam			
	1047	do	North Reading	do		0.190	62	14
293. Carpinus Caroliniana *Hornbeam. Blue Beech. Water Beech. Iron Wood.*	46	Missouri	Allenton	G. W. Letterman	Damp, alluvial			
	73[1]	Kentucky	Mercer county	W. M. Linney	Trenton limestone.			
	73[2]	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per *cubic foot*, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7826	0.8304	.....	0.8065	1.27	1.27	1.27	.....	All sap-wood	416
0.7774	.....	.....	0.7952	1.21	1.35	1.41	.....	0.5 sap-wood	599
0.8208	0.7735	0.8089		1.64	1.42				
			0.8009			1.34	49.91		
0.7402	0.7394	.....	0.7398	0.23	.....	0.23	.....	.....	40[1]
0.7234	.....	.....	0.7234	0.65	.....	0.65	.....	.....	40[2]
0.8332	.....	.....	0.8332	0.79	.....	0.79	.....	.....	40[3]
0.7517	0.7360	.....	0.7439	0.22	0.34	0.28	.....	.....	50
0.7200	0.7285	.....	0.7243	0.23	0.18	0.21	.....	Second growth	135
			0.7529			0.43	46.92		
0.7532	0.7412	.....	0.7472	0.51	0.48	0.50	46.56	.....	512
0.6650	0.7004	.....	0.6827	1.55	1.41	1.49	42.55	.....	687*
0.5520	0.5627	.....	0.5574	0.35	.....	0.35	34.74	0.33 sap-wood	729
0.5698	0.6076	.....	0.5887	0.12	0.11	0.12	36.69	.....	578
0.3820	0.3827	.....	0.3828	0.10	0.12	0.11	.....	.....	18
0.4720	.....	.....	0.4720	0.26	.....	0.26	.....	.....	258[1]
0.4716	.....	.....	0.4716	0.21	.....	0.21	.....	.....	258[2]
0.4494	.....	.....	0.4494	.....	.....	.....	.....	.....	258[3]
0.4693	.....	.....	0.4693	0.18	0.21	0.20	.....	.....	516
0.4663	0.4247	.....	0.4455	0.16	0.17	0.17	.....	.....	727
0.4613	0.4594	0.4656	0.4621	0.14	0.12	0.13	.....	.....	868
			0.4504			0.18	28.07		
0.6663	0.6556	.....	0.6610	0.34	0.33	0.34	.....	.....	9
0.6200	.....	.....	0.6200	0.75	.....	0.75	.....	Red beech	44[a]
0.6343	.....	.....	0.6343	0.70	.....	0.70	.....	Red beech	44[b]
0.7992	.....	.....	0.7992	0.57	.....	0.57	.....	White beech	55[a]
0.7150	0.7200	.....	0.7175	0.54	.....	0.54	.....	White beech	55[b]
0.7619	0.6605	.....	0.7112	0.31	0.38	0.35	.....	.....	119
0.6897	0.6560	.....	0.6729	0.47	.....	0.47	.....	.....	765
0.7017	0.6825	0.6870	0.6904	0.29	0.38	0.34	.....	First and second sp. gr. determinations made on 0.5 sap-wood; third sp. gr. determination made on sap-wood.	853
			0.6883			0.51	42.89		
0.7608	0.7636	.....	0.7622	0.34	0.37	0.36	.....	.....	11
0.8919	.....	.....	0.8919	0.49	0.67	0.58	.....	.....	87
0.8512	0.8402	0.8870	0.8595	0.53	0.66	0.60	.....	.....	870
0.8491	0.8296	0.8534	0.8440	0.55	0.51	0.53	.....	.....	877
0.7818	0.7940	0.7768	0.7842	0.51	0.39	0.45	.....	.....	1047
			0.8284			0.50	51.62		
0.7657	0.7711	.....	0.7684	0.76	0.80	0.78	.....	.....	46
0.7264	.....	.....	0.7264	0.80	0.79	0.80	.....	.....	73[1]
0.7526	0.7504	.....	0.7515	1.34	.....	1.34	.....	.....	73[2]

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
293. Carpinus Caroliniana—continued	77	Missouri	Allenton	G. W. Letterman	Rich, alluvial	0.052	22	
	872	Massachusetts	Danvers	J. Robinson	Low, rich			
	1038	do	do	do	Gravelly			
BETULACEÆ.								
294. Betula alba, *var.* populifolia. *White Birch. Old-field Birch. Gray Birch.*	10	do	Arnold Arboretum	C. S. Sargent	Drift	0.170	10	26
	848	do	Danvers	J. Robinson	Gravelly	0.196	16	33
295. Betula papyrifera. *Canoe Birch. White Birch. Paper Birch.*	223	Vermont	Charlotte	C. G. Pringle	Gravelly			
	224	do	do	do	do			
	225	do	do	do	do			
	722	Montana	Missoula	Sereno Watson	Wet			
	836	Massachusetts	Townsend	J. Robinson		0.234	26	
	990	Alaska	Chilcoot inlet	Paul Schultze		0.188	57	
	1065	Vermont	Charlotte	C. G. Pringle				
	1066	do	do	do				
	1067	do	do	do				
296. Betula occidentalis. *Black Birch.*	528	Colorado	Engelmann's cañon	Robert Douglas	Wet, sandy			
	629	California	Strawberry valley	G. Engelmann and C. S. Sargent.	Wet, peaty			
297. Betula lutea. *Yellow Birch. Gray Birch.*	155	Vermont	Charlotte	C. G. Pringle	Swampy			
	230[1]	do	do	do	Clay			
	230[2]	do	do	do	Gravelly			
	843	Massachusetts	Danvers	J. Robinson	do	0.160	34	
	1068	Vermont	Charlotte	C. G. Pringle	do			
	1069	do	do	do	do			
	1070	do	do	do	do			
298. Betula nigra. *Red Birch. River Birch.*	136	Missouri	Allenton	G. W. Letterman	Moist loam			
	398	do	do	do	Alluvial			
	841	Massachusetts	North Andover	J. Robinson	do	0.192	30	
	842	do	do	do	do	0.214	32	8
	1184	Missouri	Allenton	G. W. Letterman	Sandy loam			
299. Betula lenta. *Cherry Birch. Black Birch. Sweet Birch. Mahogany Birch.*	4	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.362	12	61
	221	Vermont	Charlotte	C. G. Pringle	Gravelly			
	844	Massachusetts	Danvers	J. Robinson	do	0.118	41	22

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.7591	0.6907	.....	0.7249	0.60	0.52	0.56	.....	.....	77
0.7014	0.7085	0.7137	0.7079	0.88	0.93	0.91	.....	.....	872
0.7080	0.6804	0.6896	0.6927	0.55	0.65	0.60	.....	.....	1038
			0.7286			0.83	45.41		
0.5361	.....	.....	0.5361	0.32	0.27	0.30	.....	Sap-wood	10
0.6330	0.6088	0.6061	0.6160	0.28	0.28	0.28	.....	First and third sp. gr. determinations made on sap-wood	848
			0.5760			0.29	35.90		
0.4594	0.4757	.....	0.4676	0.24	0.24	0.24	.....	All sap-wood	223
0.6021	0.5979	.....	0.6000	0.30	0.31	0.31	.....	0.5 sap-wood	224
0.6086	0.6207	.....	0.6297	0.25	0.22	0.24	.....	First sp. gr. determination made on 0.5 sap-wood; second sp. gr. determination made on 0.75 sap-wood.	225
0.6240	0.6096	.....	0.6168	0.25	0.22	0.24	.....	All sap-wood	722
0.6290	0.6260	0.6395	0.6315	0.20	0.19	0.20	.....	All sap-wood	836
0.6081	0.6060	.....	0.6070	0.24	0.25	0.25	.....	All sap-wood	990
0.6801	0.6227	0.6112	0.6380	0.28	0.26	0.27	.....	All sap-wood	1065
0.6002	0.5665	0.5843	0.5837	0.25	0.24	0.25	.....	All sap-wood	1066
0.5894	0.5908	0.5745	0.5849	0.26	0.22	0.24	.....	All sap-wood	1067
			0.5955			0.25	37.11		
0.5880	0.6183	.....	0.6032	0.18	0.18	0.18	.....	All sap-wood	528
0.6543	0.5777	0.5707	0.6028	0.44	0.37	0.41	.....	.....	629
			0.6030			0.30	37.58		
0.5759	0.6237	.....	0.5998	0.29	0.20	0.25	.....	0.5 sap-wood	155
0.7047	.....	.....	0.7047	0.33	.....	0.33	.....	0.875 sap-wood	230[1]
0.6416	.....	.....	0.6416	0.60	.....	0.60	.....	.....	230[2]
0.7032	0.7200	0.7080	0.7104	0.16	0.25	0.20	.....	All sap-wood	843
0.6468	0.6293	0.6573	0.6445	0.28	0.25	0.27	.....	.....	1068
0.6380	0.6472	0.6256	0.6369	0.28	0.22	0.25	.....	.....	1069
0.6557	0.6543	0.6382	0.6494	0.27	0.27	0.27	.....	.....	1070
			0.6553			0.31	40.84		
0.5608	0.5721	.....	0.5665	0.30	0.31	0.31	.....	All sap-wood	136
0.5554	0.5508	.....	0.5531	0.27	0.31	0.29	.....	All sap-wood	398
0.5910	0.5759	0.5811	0.5827	0.38	0.38	0.38	.....	From butt: Sap-wood	841
0.6049	0.5975	0.5965	0.5996	0.38	0.38	0.38	.....	From top of trunk: Sap-wood	842
0.5556	0.5836	0.5988	0.5793	0.44	0.40	0.42	.....	.....	1184
			0.5762			0.35	35.91		
0.7555	0.7604	.....	0.7579	0.16	0.20	0.18	.....	All sap-wood	4
0.7344	0.6945	.....	0.7145	0.25	0.32	0.29	.....	.....	221
0.8115	0.8160	0.8109	0.8128	0.26	0.33	0.30	.....	All sap-wood	844
			0.7617			0.26	47.47		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
300. Alnus maritima *Seaside Alder.*	809	Delaware	Adger's mill	W. M. Canby	Moist, sandy loam	0.108	25	
	810	do	Pepper's mill	do	do			
301. Alnus rubra *Alder.*	967	Alaska	Sitka	Paul Schultze				
	991	Washington territory.	Puyallup	G. Engelmann and C. S. Sargent.				
	1025	Oregon	Portland Furniture Company.	do				
302. Alnus rhombifolia *Alder.*	717	Montana	Missoula	Sereno Watson	Wet			
	979	Oregon	Drain	C. S. Sargent	Moist loam			
303. Alnus oblongifolia *Alder.*	694	California	San Bernardino	W. G. Wright				
304. Alnus serrulata *Black Alder. Smooth Alder.*	541	Alabama	Stockton	C. Mohr	Wet			
	611	Georgia	Altamaha river	A. H. Curtiss	Damp	0.108	38	
305. Alnus incana *Speckled Alder. Hoary Alder. Black Alder.*	374	Vermont	Hinesburgh	C. G. Pringle	Wet loam			
	862	Massachusetts	Danvers	J. Robinson	do			
SALICACEÆ.								
306. Salix nigra *Black Willow.*	232	Vermont	Shelburne	C. G. Pringle	Wet, sandy			
	855	Massachusetts	Topsfield	J. Robinson	Alluvial	0.202	12	50
307. Salix amygdaloides *Willow.*	884	Utah	Salt Lake City	M. E. Jones	Clay			
	908	Colorado	Cañon City	E. Weston				
	911	do	do					
308. Salix lævigata *Willow.*	690	California	Santa Cruz	G. Engelmann and C. S. Sargent.	Moist, sandy			
309. Salix lasiandra *Willow.*	1219	do	do	C. L. Anderson				
309. Salix lasiandra, *var.* lancifolia	640	do	Strawberry valley	G. Engelmann and C. S. Sargent.	Moist, rich			
	981	Oregon	Portland	F. Skinner	Alluvial			
309. Salix lasiandra, *var.* Fendleriana	889	Utah	City Creek cañon	M. E. Jones	Gravelly			
310. Salix longifolia *Sand-bar Willow.*	1174	Illinois	Rockford	M. S. Bebb		0.120	4	11
310. Salix longifolia, *var.* exigua	955	Texas	Matagorda bay	C. Mohr	Moist, saline			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4988	0.5186	.....	0.5087	0.34	0.35	0.35	.....	.....	809
0.4923	0.4889	.....	0.4906	0.37	0.47	0.42	.....	.....	816
			0.4996			0.39	31.13		
0.4922	0.4851	.....	0.4887	0.39	0.40	0.39	.....	.....	967
0.4855	0.4847	.....	0.4856	0.59	0.49	0.54	.....	.....	991
0.4829	0.4565	.....	0.4697	0.36	0.28	0.32	.....	.....	1025
			0.4813			0.42	29.99		
0.4556 0.4427	0.3722	0.3604	0.4077	0.39 0.43	0.45 0.30	0.39	.....	First sp. gr. determination made on sap-wood; second sp. gr. determination made on 0.5 sap-wood.	717
0.4172	0.4183	.....	0.4178	0.19	0.25	0.22	.....	.....	979
			0.4127			0.31	25.72		
0.4138	0.3823	.....	0.3981	0.42	0.43	0.42	24.81	.....	694
0.4714	0.4635	.....	0.4675	0.32	0.34	0.33	.....	.....	541
0.4573	0.4738	.....	0.4656	0.47	0.39	0.43	.....	.....	611
			0.4666			0.38	29.08		
0.4029	0.4842	.....	0.4436	0.47	0.40	0.44	.....	All sap-wood	874
0.4960	0.4642	0.4732	0.4778	0.38	0.40	0.39	28.71	0.75 sap-wood	862
			0.4607			0.42	.....		
0.4327	0.4102	.....	0.4215	0.62	0.79	0.71	.....	.....	232
0.4790	0.4621	0.4676	0.4696	0.65	0.71	0.68	.....	First and second sp. gr. determinations made on 0.66 sap-wood; third sp. gr. determination made on 0.5 sap-wood.	855
			0.4456			0.70	27.77		
0.4530	.....	.....	0.4530	0.55	0.89	0.72	.....	.....	884
0.4689 0.4612	0.4448 0.4201	.....	0.4488	1.08 1.38	0.91 1.08	1.11	.....	One tree	908 911
			0.4509			0.92	28.10		
0.4916	0.4828	.....	0.4872	0.56	0.60	0.58	30.36	.....	690
0.4810	0.4702	.....	0.4756	0.60	0.59	0.60	29.64	.....	1219
0.4509	0.4536	.....	0.4519	0.61	0.73	0.67	.....	.....	640
0.5063	0.4573	0.4089	0.4575	1.09	0.72	0.91	.....	.....	981
			0.4547			0.79	28.34		
0.4576	0.4619	.....	0.4598	0.53	0.58	0.56	28.65	.....	689
0.4901	0.4959	.....	0.4930	0.46	0.49	0.48	30.72	.....	1174
0.5221	0.5324	0.5482	0.5342	1.02	1.09	1.06	33.29	.....	955

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
311. Salix sessilifolia	1143	Oregon	Mouth of Willamette river.	Jos. Howells	Alluvial			
312. Salix discolor *Glaucous Willow.*	859	Massachusetts	Topsfield	J. Robinson	Loam	0.091	7	8
	1225	New York	Ellenburg	J. H. Sears	do			
313. Salix flavescens	641	New Mexico	Pinos Altos mountains.	E. L. Greene				
	721	Montana	Pattee's cañon, Missoula.	S. Watson	Rich, moist			
	888	Utah	City Creek cañon	M. E. Jones	Moist, gravelly	0.060	13	4
313. Salix flavescens, *var.* Scouleriana *Black Willow.*	972	Washington territory.	Seattle	G. Engelmann and C. S. Sargent.	Moist, sandy	0.160	22	10
314. Salix Hookeriana	966	Oregon	Winchester bay	do	Sandy saline			
315. Salix cordata, *var.* vestita *Diamond Willow.*	1175	Nebraska	Brownsville	R. W. Furnas	Alluvial	0.148	5	11
	1180	Iowa	Sioux City	W. G. Wright	do	0.117	8	14
316. Salix lasiolepis *Willow.*	669	California	Santa Cruz	G. Engelmann and C. S. Sargent.	Sandy loam	0.128	16	
317. Salix Sitchensis *Silky Willow.*	1161	Oregon	Sauvie's Island	Jos. Howells	Alluvial			
318. Populus tremuloides *Aspen. Quaking Asp.*	272[1]	Colorado	Alpine	T. S. Brandegee	Damp			
	272[2]	do	do	do	do			
	272[3]	do	do	do	do			
	411	Vermont	Charlotte	C. G. Pringle	Moist			
	1035	Massachusetts	Danvers	J. Robinson	Gravelly	0.137	17	7
319. Populus grandidentata *Poplar.*	157	Vermont	Charlotte	C. G. Pringle	Sandy loam			
	847	Massachusetts	Danvers	J. Robinson	Gravelly	0.220	41	
320. Populus heterophylla *River Cottonwood. Swamp Cottonwood.*	522	Tennessee	Nashville	A. Gattinger	Alluvial			
	554	Alabama	Stockton	C. Mohr	do			
231. Populus balsamifera *Balsam. Tacamahac. Balm of Gilead.*	159	Vermont	Shelburne	C. G. Pringle	Sandy loam			
	961	Alaska	Chilcoot inlet	Paul Schultze	Alluvial			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4326	0.4545	0.4319	0.4397	0.40	0.50	0.50	27.40	.....	1143
0.4030 0.4434	0.4184 0.4643	.....	0.4548	0.48	0.49	0.49	.....	.....	859
0.3974	.....	.....	0.3974	0.36	0.37	0.37	.....	.....	1225
			0.4261			0.43	26.55		
0.4912	0.5081	.....	0.4997	0.70	0.68	0.74	.....	.....	641
0.5234	0.4953	.....	0.5094	0.36	0.42	0.39	.....	.....	721
0.4923	0.4707	.....	0.4815	0.67	0.72	0.70	.....	.....	888
			0.4969			0.61	30.97		
0.5320	0.5504	.....	0.5412	0.43	0.34	0.39	33.73	.....	972
0.5471	0.5220	.....	0.5350	0.33	0.32	0.32	33.34	.....	966
0.5750	0.5683	.....	0.5716	0.49	0.44	0.47	.....	.....	1175
0.6393	0.6450	.....	0.6422	0.72	0.71	0.72	.....	.....	1180
			0.6069			0.59	37.82		
0.5704	0.5323	0.5734	0.5587	1.01	0.95	0.98	34.82	.....	609
0.5011	0.5133	.....	0.5072	0.67	0.52	0.59	31.61	.....	1161
0.3785	.....	.....	0.3785	0.76	.....	0.76	.....	All sap-wood	272[1]
0.3579	.....	.....	0.3579	0.72	.....	0.72	.....	All sap-wood	272[2]
0.3569	.....	.....	0.3569	.....	.....	.....	.....	All sap-wood	272[3]
0.4880	0.5021	.....	0.4951	0.31	0.31	0.31	.....	All sap-wood	411
0.4184 0.4227	0.4255 0.4446	.....	0.4278	0.43	0.39	0.41	.....	All sap-wood	1035
			0.4032			0.55	25.13		
0.5119	0.4872	.....	0.4996	.....	0.43	0.43	.....	All sap-wood	157
0.4205	0.4416	0.4182	0.4268	0.45	0.47	0.46	.....	All sap-wood	847
			0.4632			0.45	28.87		
0.4023	0.4113	.....	0.4068	0.74	0.70	0.72	.....	All sap-wood	523
0.4115	0.4105	.....	0.4110	0.90	0.90	0.90	.....	.....	554
			0.4089			0.81	25.48		
0.3524	0.3404	.....	0.3464	1.12	0.72	0.92	.....	All sap-wood	159
0.3843	0.3768	.....	0.3806	0.39	0.40	0.40	.....	.....	901
			0.3635			0.66	22.65		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
321. Populus balsamifera, *var.* candicans	1054	Massachusetts	Topsfield	J. Robinson	Gravelly	0.203	11	19
322. Populus angustifolia. *Black Cottonwood.*	552	Colorado	Manitou Springs	Robert Douglas	Sandy loam	0.098	10	11
323. Populus trichocarpa. *Black Cottonwood. Balsam Cottonwood.*	1012	Oregon	Saint John's Barrel Factory, Portland.	F. Skinner				
	1028	do	Portland Furniture Company.	G. Engelmann and C. S. Sargent.				
324. Populus monilifera. *Cottonwood. Necklace Poplar. Carolina Poplar. Big Cottonwood.*	199	Ohio	Barney and Smith Manufacturing Co.	E. E. Barney				
	234	Vermont	Charlotte	C. G. Pringle	Alluvial			
	255	Missouri	Allenton	G. W. Letterman	do			
	304	do	do	do	do			
	309	Texas	Dallas	J. Reverchon	do	0.806	5	59
	754	Florida	Chattahoochee	A. H. Curtiss	do	0.250	20	
325. Populus Fremontii. *Cottonwood.*	659	California	Sacramento valley	G. R. Vasey	do	0.444	16	19
325. Populus Fremontii, *var.* Wislizeni. *Cottonwood. White Cottonwood.*	646	do	San Bernardino	W. G. Wright	do			
CONIFERÆ.								
326. Libocedrus decurrens. *White Cedar. Bastard Cedar. Post Cedar. Incense Cedar.*	579	do	Saw-mill, Strawberry valley.	G. Engelmann and C. S. Sargent.				
	634	do	do	do				
	662	do	Saw-mill, San Bernardino mountains.	W. G. Wright				
327. Thuya occidentalis. *White Cedar. Arbor-vitæ.*	104	Vermont	Monkton	C. G. Pringle	Cold, peaty			
	379	do	do	do	do			
	782	New Brunswick		Intercolonial railway.				
	783	do	Bridgeton	Ed. Sinclair				
	790	Province of Quebec	Amqui	A. Grant				
	792	do		Grand Trunk railway.				
	796	do		do				
	874	Maine	Mattawamkeag	J. Robinson		0.172	19	71
	1099	Wisconsin	Eau Claire	H. C. Putnam	Drift			
328. Thuya gigantea. *Red Cedar. Canoe Cedar.*	1017	Oregon	Weidler's saw-mill, Portland.	G. Engelmann and C. S. Sargent.				
	1021	do	Portland Furniture Company.	do				
329. Chamæcyparis sphæroidea. *White Cedar.*	350	Alabama	Cottage Hill	C. Mohr	Sandy, wet	0.298	7	20
	850	Massachusetts	Beverly	J. Robinson	Swampy			
	851	do	do	do	do			
	852	do	do	do	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.3959	0.4222	0.4301	0.4161	0.48	0.43	0.46	25.93	Cultivated. First and second sp. gr. determinations made on sap-wood.	1054
0.3942	0.3881	.....	0.3912	0.82	0.75	0.79	24.38	.....	552
0.3511	0.3656	0.3567	0.3578	1.47	0.87	1.17	.....	Third sp. gr. determination made on sap-wood	1012
0.4163	0.3937	.....	0.4050	1.56	1.18	1.37	.....	.....	1028
			0.3814			1.27	23.77		
0.3817	0.3946	.....	0.3882	1.34	1.43	1.39	.....	.....	199
0.3939	0.3302	.....	0.3621	0.68	0.94	0.81	.....	.....	234
0.3315	0.3444	.....	0.3380	1.18	0.92	1.05	.....	.....	255
0.3201	0.3231	.....	0.3216	0.83	0.79	0.81	.....	.....	304
0.4706	0.4778	.....	0.4742	1.09	0.96	1.03	.....	.....	309
0.4355	0.4632	.....	0.4404	0.69	0.60	0.65	.....	.....	754
			0.3889			0.96	24.24		
0.5490	0.4655	0.4597	0.4914	0.77	.....	0.77	30.62	All sap-wood	659
0.4827	0.4176	0.4860	0.4621	1.17	1.09	1.13	28.80	.....	646
0.3891	0.3830	.....	0.3861	0.03	0.04	0.04	.....	.....	579
0.3428	0.3769	.....	0.3599	0.13	0.17	0.15	.....	.....	634
0.4586	0.4596	.....	0.4591	0.08	0.05	0.06	.....	.....	662
			0.4017			0.08	25.03		
0.3048	0.3021	.....	0.3035	0.29	0.25	0.27	.....	.....	104
0.2847	0.2870	.....	0.2859	0.20	0.29	0.29	.....	.....	379
0.3284	0.3275	.....	0.3280	0.49	0.51	0.50	.....	.....	782
0.3163	0.3275	0.3272	0.3237	0.39	0.44	0.42	.....	.....	783
0.3016	0.3007	.....	0.3012	0.29	0.31	0.30	.....	.....	790
0.3452	0.2880	.....	0.3166	0.36	0.44	0.40	.....	.....	792
0.3108	0.3104	.....	0.3106	0.43	0.37	0.40	.....	.....	796
0.3584	0.3529	0.3697	0.3603	0.39	0.34	0.37	.....	.....	874
0.3121	0.3232	.....	0.3177	0.37	0.38	0.38	.....	.....	1099
			0.3164			0.37	19.72		
0.3996	0.4178	.....	0.4087	0.12	0.14	0.13	.....	.....	1017
0.3460	0.3551	.....	0.3506	0.24	0.19	0.22	.....	.....	1021
			0.3796			0.17	23.66		
0.3337	0.3447	.....	0.3392	0.94	0.90	0.92	.....	.....	350
0.3105	0.3644	0.3081	0.3277	0.17	0.15	0.16	.....	.....	850
0.3038	0.3036	0.3182	0.3085	0.13	0.11	0.12	.....	.....	851
0.2990	0.3091	0.4527	0.3536	0.11	0.13	0.12	.....	.....	852
			0.3322			0.33	20.70		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
330. Chamæcyparis Nutkaensis *Yellow Cypress. Sitka Cypress.*	969	Alaska	Sitka	Paul Schultze				
	983	British Columbia	Saw-mill, Victoria	G. Engelmann and C. S. Sargent.				
	994	Alaska	Peril strait	Paul Schultze				
	1000	do	Weidler's saw-mill, Portland, Oregon.	G. Engelmann and C. S. Sargent.				
331. Chamæcyparis Lawsoniana *Port Orford Cedar. Oregon Cedar. White Cedar. Lawson's Cypress. Ginger Pine.*	701	Oregon	Dean & Co.'s saw-mill, Marshfield.	do				
	707	do	do	do				
332. Cupressus macrocarpa *Monterey Cypress.*	675	California	Monterey	do	Gravelly loam			
333. Cupressus Goveniana	691	do	Marin county	G. R. Vasey	Dry ridges	0.283	95	
	1100	do	Calistoga	W. F. Fisher	do	0.234	36	
335. Cupressus Guadalupensis	798	Eastern Arizona	San Francisco mountains.	E. L. Greene	Rocky			
	1149	Arizona	Santa Catalina mountains.	C. G. Pringle	do			
336. Juniperus Californica *Juniper.*	1229	California	San Bernardino county.	do	Gravelly			
336. Juniperus Californica, *var.* Utahensis *Juniper.*	887	Utah	Lewiston	M. E. Jones	do	0.072	55	12
337. Juniperus pachyphlœa *Juniper.*	555	New Mexico	Silver City	E. L. Greene	Stony			
	592	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Gravelly			
	692	do	do	do	do			
338. Juniperus occidentalis *Juniper.*	624	California	Yreka plains	do	do			
338. Juniperus occidentalis, *var.* monosperma *Juniper.*	420	New Mexico	Silver City	E. L. Greene	Stony	0.175	22	64
	527	Colorado	Manitou Springs	Robert Douglas	Gravelly			
338. Juniperus occidentalis, *var.* conjugens *Juniper.*	939	Texas	Austin	C. Mohr	Limestone	0.184	23	28
	1102	do	do	S. B. Buckley	do			
339. Juniperus Virginiana *Red Cedar. Savin.*	14	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.230	19	49
	327	Texas	Dallas	J. Reverchon	Calcareous	0.484	16	66
	734	Florida	Chattahoochee	A. H. Curtiss	do			
	800	do	Saint John's river	do	Sandy loam			
	887	Massachusetts	Danvers	J. Robinson	Drift			
	924	Florida	Chattahoochee	C. Mohr	Alluvial			
	1055	Massachusetts	Topsfield	J. Robinson	Drift	0.203	15	37

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4011	0.4484	.....	0.4248	0.30	0.37	0.34	.....	.....	969
0.4987	0.5010	.....	0.4999	0.29	0.34	0.32	.....	.....	983
0.5356	0.5166	.....	0.5261	0.29	0.34	0.32	.....	.....	994
0.4555	0.4686	.....	0.4621	0.39	0.36	0.38	.....	.....	1000
			0.4782			0.34	29.80		
0.4356	0.4487	.....	0.4422	0.07	0.12	0.10	.....	.....	701
0.4380	0.5259	.....	0.4819	0.08	0.09	0.09	.....	.....	707
			0.4621			0.10	28.80		
0.6260	0.6263	.....	0.6261	0.55	0.59	0.57	39.02	.....	975
0.4492	0.4733	.....	0.4613	0.41	0.35	0.38	.....	.....	691
0.4620	0.4910	.....	0.4765	0.54	0.47	0.51	.....	.....	1100
			0.4689			0.45	29.22		
0.4048	0.4643	0.4617	0.4636	0.43	0.38	0.41	.....	All sap-wood	798
0.4826	0.5272	.....	0.5049	0.41	0.51	0.46	.....	.....	1149
			0.4843			0.44	30.18		
0.6309	0.6255	.....	0.6282	0.77	0.73	0.75	39.15	.....	1229
0.5504	0.5539	.....	0.5522	0.47	0.51	0.49	34.41	0.8 sap-wood	887
0.5744	0.6965	.....	0.6355	0.11	0.16	0.14	.....	.....	555
0.5085 0.5185	0.5619 0.5321	.....	0.5302	0.07 0.08	0.07 0.09	0.08	.....	One tree	592 692
			0.5829			0.11	36.32		
0.5724	0.5807	.....	0.5765	0.12	0.12	0.12	35.93	.....	624
0.7329	0.7440	.....	0.7385	0.68	0.68	0.68	.....	.....	420
0.6768	0.6935	.....	0.6852	0.89	0.86	0.88	.....	.....	527
			0.7119			0.78	44.36		
.....	0.6967	.....	0.6967	0.45	0.47	0.46	.....	.....	939
0.6750	0.6840	0.6948	0.6846	0.39	0.53	0.46	.....	.....	1102
			0.6907			0.46	43.04		
0.5112	0.5045	.....	0.5079	0.15	0.14	0.14	.....	0.1 sap-wood	14
0.4585	0.4493	.....	0.4539	0.12	0.14	0.13	.....	.....	327
0.5455	0.5310	0.5533	0.5433	0.16	0.17	0.16	.....	.....	734
0.4901	0.4727	.....	0.4814	0.13	0.08	0.11	.....	.....	800
0.4804	0.4693	0.4733	0.4743	0.16	0.14	0.15	.....	.....	837
0.4838	0.4705	0.4740	0.4761	0.16	0.12	0.14	.....	.....	924
0.5290	0.4937	0.5107	0.5111	0.09	0.09	0.09	.....	.....	1055
			0.4926			0.13	30.70		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
340. Taxodium distichum *Bald Cypress. Black Cypress. Red Cypress. White Cypress. Deciduous Cypress.*	535	Alabama	Stockton	C. Mohr	Alluvial			
	542	do	Otis & Co., saw-mill.	do	do			
	543	do	do	do	do			
	581	Arkansas	Little Rock	G. W. Letterman	do			
	582	do	do	do	do			
	741	Florida	Chattahoochee	A. H. Curtiss		0.514	55	230
	894[1]			Department of Agriculture.				
	894[2]			do				
	923	Alabama	Stockton	C. Mohr	Alluvial			
	1212			do				
	1213			do				
	1214	Louisiana	Bayou La Battery	do	Alluvial			
341. Sequoia gigantea *Big Tree.*	657	California	Tulare county	G. Engelmann and C. S. Sargent.	Granite			
	666	do	do	do	do			
342. Sequoia sempervirens *Redwood.*	673	do	Russian river	C. S. Sargent				
	710	do	Santa Cruz	Turner, Kennedy & Shaw.				
	711[1]	do	do	do				
	711[2]	do	do	do				
	712	do	Mendocino county	J. Kentfield & Co				
	713	do	do	do				
	714	do	do	do				
	715	do	do	do				
343. Taxus brevifolia *Yew.*	978	Oregon	Portland	G. Engelmann and C. S. Sargent.	Moist, rich	0.279	8	45
344. Taxus Floridana *Yew.*	305	Florida	Flat Creek	A. H. Curtiss	Sandy loam			
345. Torreya taxifolia *Stinking Cedar. Savin.*	62	do	Chattahoochee	C. S. Sargent	Alluvial			
	277	do	do	A. H. Curtiss	Calcareous	0.284	12	78
346. Torreya Californica *California Nutmeg. Stinking Cedar.*	651	California	Marin county	G. R. Vasey	Stony	0.361	20	73
347. Pinus Strobus *White Pine. Weymouth Pine.*	1	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.510	19	51
	164	Michigan	Woodsum Machine Company.	E. E. Barney				
	208	do	Barney & Smith Manufacturing Co.	do				
	222	Vermont	Charlotte	C. G. Pringle	Wet, swampy			
	723	Pennsylvania	Williamsport	do				
	777	New Brunswick		Intercolonial railway.				

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4559	0.4442	.....	0.4501	0.44	0.40	0.42	.....	.....	535
0.5114	0.4896	.....	0.5005	0.35	0.31	0.33	.....	White cypress	542
0.5017	0.5224	.....	0.5121	0.66	0.52	0.59	.....	Black cypress	543
0.4683	0.4545	.....	0.4614	0.38	0.45	0.42	.....	.....	581
0.4683	0.5031	.....	0.4857	0.34	0.29	0.32	.....	.....	582
0.4139	0.4004	0.3808	0.4020	0.27	0.36	0.32	.....	White cypress sap-wood	741
0.2444	0.2013	.....	.....	0.56	.....	.....	.....	Butt of knee	804[1]
0.2362	0.2304	.....	.....	0.55	.....	.....	.....	Top of knee	804[2]
0.3442	0.3656	.....						From opposite sides of center of tree next to heart	
0.4282	0.3705	.....	0.4072	0.39	.....	0.44	.....	Next outside of preceding	923
0.4599	0.5022	.....		0.48				do	
0.4112	0.4336	0.3402						Outside of tree	
0.3860	0.3750	.....	0.3805	0.50	0.50	0.50	.....	Outside wood	1212
0.4123	0.4957	.....	0.4540	0.51	0.53	0.52	.....	Heart-wood	1213
0.4878	0.4904	.....	0.4891	0.36	0.37	0.37	.....	Black cypress	1214
			0.4543			0.42	27.65		
0.3234	0.3202	.....	0.3240	0.54	0.50	0.44	.....	.....	657
0.3236	0.3280			0.41	0.38				
0.2524	0.2523	.....	0.2524	0.50	0.64	0.57	.....	All sap-wood	666
			0.2882			0.50	18.20		
0.3788	0.3965	.....	0.3877	0.12	0.23	0.17	.....	.....	675
0.4242	0.4281	.....	0.4262	0.16	0.19	0.18	.....	Wood from top of tree	710
0.3963	0.4444	.....	0.4204	0.11	.....	0.11	.....	Wood from butt of tree	711[1]
0.4912	0.4562	.....	0.4737	0.14	.....	0.14	.....	Wood from butt of tree	711[2]
0.3015	0.2982	.....	0.2999	0.06	0.11	0.09	.....	.....	712
0.3610	0.3612	.....	0.3611	0.18	0.15	0.17	.....	.....	713
0.5226	0.4714	.....	0.4970	0.17	0.16	0.17	.....	.....	714
0.4827	0.5181	.....	0.5004	0.10	0.13	0.12	.....	Wood with curled grain	715
			0.4208			0.14	26.22		
0.6390	0.6559	0.6230	0.6301	0.22	0.22	0.22	30.83	.....	978
0.6340	.....	.....	0.6340	0.20	0.22	0.21	30.51	.....	305
0.6234	0.5369	.....	0.5702	1.08	1.38	1.23	.....	.....	62
0.4728	0.4447	.....	0.4588	0.25	0.21	0.23	.....	.....	277
			0.5145			0.73	32.06		
0.4823	0.4696	.....	0.4760	1.27	1.40	1.34	20.66	.....	651
0.3946	0.4106	.....	0.4026	0.11	0.19	0.15	.....	.....	1
0.3481	0.3459	.....	0.3470	0.13	0.17	0.15	.....	.....	164
0.3400	0.3418	.....	0.3400	0.22	0.20	0.21	.....	.....	208
0.4880	0.6461	.....	0.5670	0.23	0.21	0.22	.....	.....	222
0.3690	0.3850	.....	0.3770	0.18	0.12	0.15	.....	.....	723
0.3606	0.3140	.....	0.3373	0.23	0.30	0.26	.....	.....	777

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
347. Pinus Strobus—continued	788	New Brunswick	Bridgeton	Ed. Sinclair				
	789	Province of Quebec.	Amqui	A. Grant				
	797	do		Grank Trunk railway.				
	1044	Massachusetts	Reading	J. Robinson	Drift	0.215	15	16
348. Pinus monticola *White Pine.*	975	British Columbia	Hasting's saw-mill, Burrard inlet.	G. Engelmann and C. S. Sargent.				
	987	Oregon	Cascade mountains	C. S. Sargent	Moist loam			
349. Pinus Lambertiana *Sugar Pine.*	638	California	Saw-mill, Strawberry valley.	G. Engelmann and C. S. Sargent.				
	668	do		G. R. Vasey				
	780	do	Lassen's peak	Sierra Lumber Company, San Francisco.				
350. Pinus flexilis *White Pine.*	819	Colorado	Forest City	T. S. Brandegee	Gravelly	0.502	38	120
	913	Nevada	Monitor range	A. Triple	do			
351. Pinus albicaulis	992	British Columbia	Silver Mountain valley, Fraser river.	G. Engelmann and C. S. Sargent.		0.494	50	160
352. Pinus reflexa *White Pine.*	597	Arizona	Santa Rita mountains.	do	Rocky			
	602	New Mexico	Pinos Altos mountains.	E. L. Greene				
	661	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.				
353. Pinus Parryana *Piñon. Nut Pine.*	656	California	San Diego county	G. R. Vasey				
354. Pinus cembroides *Nut Pine.*	1226	Arizona	Santa Catalina mountains.	C. G. Pringle				
355. Pinus edulis *Piñon. Nut Pine.*	397	Colorado	Cañon City	E. Weston	Gravelly	0.284	30	79
356. Pinus monophylla *Piñon. Nut Pine.*	823	Eastern Arizona	San Francisco mountains.	E. L. Greene	do			
	882	Utah	Lewiston	M. E. Jones	Rocky	0.164	19	66
	891	Eastern Arizona	San Francisco mountains.	E. L. Greene				
	900	California		Department of Agriculture.				
	915	Nevada	Danville	A. Triple	Gravelly			
357. Pinus Balfouriana	577	California	Scott mountains	G. Engelmann and C. S. Sargent.	Rocky	0.368	75	309
	631							
357. Pinus Balfouriana, *var.* aristata *Foxtail Pine. Hickory Pine.*	821	Colorado	Forest City	T. S. Brandegee		0.450	44	136
	914	Nevada	Prospect mountain	A. Triple	Rocky			
358. Pinus resinosa *Red Pine. Norway Pine.*	194	Michigan	Barney & Smith Manufacturing Co.	E. E. Barney				

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.3991	0.3970	.....	0.3980	0.20	.....	0.20	.....	.....	788
0.3624	0.3463	.....	0.3543	0.19	0.19	0.19	.....	.....	789
0.3905	0.3725	.....	0.3815	0.21	0.22	0.21	.....	.....	797
0.3503	0.3513	0.3438	0.3485	0.10	0.13	0.12	.....	.....	1044
			0.3854			0.19	24.02		
0.4291	0.4102	.....	0.4197	0.26	0.28	0.27	.....	.....	975
0.3684	0.3554	.....	0.3619	0.15	0.21	0.18	.....	Cut at 3,800 feet elevation	987
			0.3908			0.23	24.35		
0.4066	0.4014	.....	0.4040	0.17	0.16	0.17	.....	.....	638
0.3782	0.3889	.....	0.3835	0.29	0.25	0.27	.....	.....	668
0.3153	0.3201	.....	0.3177	0.22	0.24	0.23	.....	.....	730
			0.3684			0.22	22.96		
0.4965	0.4031	0.4526	0.4507	0.20	0.20	0.20	.....	Second sp. gr. determination made on sap-wood. Cut at elevation of 10,000 feet.	819
0.4209	.....	.....	0.4209	0.35	.....	0.35	.....	All sap-wood	913
			0.4358			0.28	27.16		
0.4233	0.4097	.....	0.4165	0.30	0.23	0.27	25.96	.....	992
0.4729	0.5253	0.5052	0.4971	0.24	0.24	0.24	.....	First sp. gr. determination made on sap-wood	597
0.4986	0.4961	0.4847		0.27	0.20				602
0.4869	0.4696	.....	0.4783	0.30	0.27	0.28	.....	.....	661
			0.4877			0.26	30.39		
0.5628	0.5721	.....	0.5675	0.54	.....	0.54	35.37	.....	656
0.6695	0.6330	.....	0.6512	0.88	0.92	0.90	40.58	.....	1226
0.5813	0.6963	.....	0.6388	0.57	0.68	0.62	39.81	Second sp. gr. specimen contained a knot	397
0.6000	0.5563	.....	0.5781	0.78	0.65	0.71	.....	.....	823
0.4499	0.4644	.....	0.4572	0.67	0.77	0.72	.....	.....	882
0.6140	0.7617	.....	0.6878	0.72	0.72	0.72	.....	Second sp. gr. specimen was very resinous	891
0.5715	0.5230	.....	0.5473	0.89	0.76	0.83	.....	.....	900
0.5585	.....	.....	0.5585	0.41	.....	0.41	.....	.....	915
			0.5658			0.68	35.26		
0.5434	0.5409	0.5273	0.5434	0.41	0.41	0.40	33.86	One tree	577
0.5580	0.5476	.....		0.38	0.42				631
0.4997	0.5319	0.4671	0.4996	0.18	0.18	0.18	.....	Third sp. gr. determination made on sap-wood	821
0.6149	.....	.....	0.6149	0.42	.....	0.42	.....	0.75 sap-wood	914
			0.5572			0.30	34.72		
0.4872	0.4838	.....	0.4855	0.23	0.18	0.20	.....	.....	194

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
358. Pinus resinosa—continued	315	Michigan	Hersey	W. J. Beal				
	413	Vermont	Charlotte	C. G. Pringle	Clay			
	779	New Brunswick		Intercolonial railway.				
	785	do	Bridgeton	Ed. Sinclair				
	1074	Vermont	Charlotte	C. G. Pringle				
	1075	do	do	do				
	1076	do	do	do				
359. Pinus Torreyana	996	California	San Diego county	G. Engelmann	Sandy	0.234	82	8
360. Pinus Arizonica *Yellow Pine.*	1144	Arizona	Santa Rita mountains.	C. G. Pringle	Rocky			
	1154	do	do	do	do			
	1155	do	do	do	do			
	1156	do	do	do	do			
361. Pinus ponderosa *Yellow Pine. Bull Pine.*	619	Dakota	Deadwood	Robert Douglas	Gravelly			
	626	Oregon	Saw-mill, Ashland	G. Engelmann and C. S. Sargent.				
	630	California	Strawberry valley	do	Low, wet, swampy			
	632	do	do	do				
	636	Oregon	Saw-mill, Ashland	do				
	689	California	Saw-mill, San Bernardino.	W. G. Wright				
	718	Montana	Saw-mill, Missoula	S. Watson				
	731	California	Lassen's peak	Sierra Lumber Company.				
	907	Colorado	Cañon City	E. Weston				
	910	do	do	do				
	1007	California	Saw-mill, San Bernardino.	W. G. Wright				
362. Pinus Jeffreyi *Bull Pine. Black Pine.*	578	do	Scott mountains	G. Engelmann and C. S. Sargent.	Dry, gravelly			
	633	do	do	do	do			
	667	California	Saw-mill, San Bernardino.	W. G. Wright				
363. Pinus Chihuahuana	593	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Dry, gravelly	0.510	102	53
	604	do	do	do	do			
364. Pinus contorta *Scrub Pine.*	997	British Columbia	Vancouver's island	G. Engelmann and C. S. Sargent.	do			
365. Pinus Murrayana *Tamarack. Black Pine. Lodge-pole Pine. Spruce Pine.*	293	Colorado	Forest City	T. S. Brandegee	Moist, sandy loam.	0.269	43	23
	503	do	do	C. S. Sargent	do			
	625	California	Scott mountains	G. Engelmann and C. S. Sargent.	do			
366. Pinus Sabiniana *Digger Pine. Bull Pine.*	571	do	Jolon	G. R. Vasey				
	644	do	Contra Costa county	do	Gravelly	0.312	43	

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5450	0.5416	.....	0.5433	0.20	0.24	0.22	.....	.....	315
0.5121	0.4537	.....	0.4829	0.24	0.24	0.24	.....	All sap-wood	413
0.4555	0.4911	.....	0.4733	0.28	0.29	0.29	.....	All sap-wood	779
0.4250	0.4631	.....	0.4441	0.39	0.34	0.37	.....	.....	785
0.4627	0.4752	0.5227	0.4869	0.28	0.27	0.27	.....	All sap-wood	1074
0.4931	0.4922	0.4845	0.4899	0.26	0.29	0.28	.....	First and third sp. gr. determinations made on 0.5 sap-wood; second sp. gr. determination made on sap-wood.	1075
0.4892	0.4582	0.4858	0.4777	0.24	0.31	0.28	.....	Second sp. gr. determination made on 0.5 sap-wood; third sp. gr. determination made on sap-wood.	1076
			0.4854			0.27	30.25		
0.4659	0.5119	0.4860	0.4879	0.38	0.33	0.35	30.40	First and second sp. gr. determinations made on sap-wood	996
0.5360	0.5079	.....	0.5220	0.14	0.15	0.14	.....	.....	1144
0.5066	0.7844	.....	0.6455	0.21	0.20	0.20	.....	Second sp. gr. specimen very resinous	1154
0.4567	0.4204	0.4611	0.4461	0.19	0.26	0.23	.....	.....	1155
0.4168	0.3864	.....	0.4016	0.25	0.24	0.24	.....	.....	1156
			0.5038			0.20	31.40		
0.4877	0.4813	.....	0.4845	0.27	0.26	0.27	.....	.....	619
0.4552	0.4419	.....	0.4485	0.38	0.41	0.40	.....	All sap-wood	626
0.4571	0.4152	.....	0.4362	0.38	0.36	0.37	.....	All sap-wood	630
0.5264	0.5350	.....	0.5307	0.31	0.30	0.30	.....	All sap-wood	632
0.4184	0.4240	.....	0.4212	0.34	0.43	0.39	.....	All sap-wood	636
0.5144	0.5265	.....	0.5204	0.23	0.23	0.23	.....	.....	689
0.3972	0.4479	.....	0.4225	0.40	0.36	0.38	.....	.....	718
0.4284	0.4437	.....	0.4360	0.28	0.25	0.27	.....	All sap-wood	731
0.4676	0.5305	.....	0.4990	0.58	0.40	0.49	.....	All sap-wood	907
0.4376	0.4459	.....	0.4417	0.45	0.45	0.45	.....	All sap-wood	910
0.5521	0.5412	.....	0.5466	0.30	0.33	0.32	.....	All sap-wood	1007
			0.4715			0.35	29.45		
0.4561	0.4520	.....	.....	0.22	0.20	.....	.....	One tree. Fourth sp. gr. determination made on 0.5 sap-wood.	578
0.4985	0.5075	.....	0.4785	0.23	0.36	0.25	.....		633
0.5982	0.5274	.....	0.5628	0.29	0.24	0.27	.....	All sap-wood	667
			0.5206			0.26	32.44		
0.5584	0.5780	.....	0.5457	0.37	0.37	0.39	34.01	One tree	593
0.5226	0.5239			0.41	0.40				664
0.5709	0.5985	0.5750	0.5815	0.21	0.16	0.19	36.24	.....	997
0.3550	0.3551	.....	0.3551	0.36	0.29	0.33	.....	.....	293
0.4291	0.4267	.....	0.4279	0.26	0.25	0.26	.....	.....	563
0.4204	0.4711	.....	0.4457	0.37	0.37	0.37	.....	.....	625
			0.4096			0.32	25.53		
0.4528	0.4531	.....	0.4530	0.43	0.41	0.42	.....	All sap-wood	571
0.4988	0.5312	.....	0.5150	0.40	0.35	0.37	.....	All sap-wood	644
			0.4840			0.40	30.16		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sapwood.	Heartwood.
367. Pinus Coulteri	1157	California	San Bernardino	W. G. Wright	Dry, gravelly			
368. Pinus insignis *Monterey Pine.*	676	do	Monterey	G. R. Vasey	Gravelly loam	0.544	35	
	896	do		Department of Agriculture.				
369. Pinus tuberculata *Knob-cone Pine.*	576	do	Mount Shasta	G. Engelmann and C. S. Sargent.	Gravelly	0.418	35	18
370. Pinus Tæda *Loblolly Pine. Old-field Pine. Rosemary Pine.*	82	Florida	Duval county	A. H. Curtiss	Moist, sandy	0.034	27	6
	355	Alabama	Cottage Hill	C. Mohr	Low, rich			
	388	North Carolina	Wilmington	Edward Kidder	Loam			
	389	do	do	do	do			
371. Pinus rigida *Pitch Pine.*	13	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.267	21	15
	1046	do	North Reading	J. Robinson	do	0.230	26	8
372. Pinus serotina *Pond Pine.*	83	Florida	Duval county	A. H. Curtiss	Moist, sandy loam	0.312	33	19
373. Pinus inops *Jersey Pine. Scrub Pine.*	621	South Carolina	Aiken	H. W. Ravenel	Dry, sandy	0.206	8	42
	622	do	do	do	do	0.164	28	34
	1169	Indiana	New Albany	M. J. Robinson				
	1172	New Jersey	Mount Holly	S. P. Sharples				
374. Pinus clausa *Sand Pine. Scrub Pine. Spruce Pine.*	279	Florida	Apalachicola	A. H. Curtiss	Dry, sandy barrens	0.238	6	36
375. Pinus pungens *Table-mountain Pine. Hickory Pine.*	321	Virginia	Wytheville	H. Shriver	Clay	0.264	20	35
	396	Pennsylvania	Colerain Forge	J. R. Lowrie	Slate	0.010	14	
376. Pinus muricata *Obispo Pine. Bishop's Pine.*	671	California	Marin county	G. R. Vasey	Gravelly	0.243	20	
377. Pinus mitis *Yellow Pine. Short-leaved Pine. Spruce Pine. Bull Pine.*	278	Florida	Chattahoochee	A. H. Curtiss	Clay	0.015	33	
	319	Louisiana	Amite	C. Mohr	Sandy loam			
	557	Arkansas	Texarkana	F. L. Harvey	do			
	558	do	do	do	do			
	559	do	do	do	do			
378. Pinus glabra *Cedar Pine. Spruce Pine. White Pine.*	142	South Carolina	Bonneau's Depot	H. W. Ravenel	Rich upland			
	544	Mississippi	Gainesville	C. Mohr	Low, sandy			
	764	Florida	Chattahoochee	A. H. Curtiss	Low, wet			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

Specific gravity determinations.				Ash determinations.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4272	0.3904	.....	0.4133	0.34	0.40	0.37	25.76	All sap-wood	1157
0.4052	0.5244	.....	0.5098	0.25	0.20	0.23	.....		676
0.4082	0.4016	.....	0.4050	0.34	0.37	0.36	.....		896
			0.4574			0.30	28.50		
0.3469	0.3529	.....	0.3499	0.36	0.30	0.33	21.81		576
0.5610	0.5609	.....	0.5609	0.26	0.29	0.27	.....	All sap-wood	82
0.5788	0.5466	.....	0.5627	0.25	0.26	0.26	.....	All sap-wood	355
0.5458	0.5654	.....	0.5556	0.28	0.26	0.27	.....	Rosemary pine	388
0.5045	0.4896	.....	0.4971	0.27	0.23	0.25	.....	All sap-wood	389
			0.5441			0.26	33.91		
0.5597	0.5669	.....	0.5633	0.19	0.21	0.20	.....	All sap-wood	13
0.4065 0.4131	0.4154 0.6323	.....	0.4668	0.32 0.19	.....	0.26	.....	First sp. gr. determination made on sap-wood; second and third sp. gr. determinations made on 0.5 sap-wood. Fourth sp. gr. specimen very resinous.	1046
			0.5151			0.23	32.10		
0.7904	0.7981	0.7990	0.7942	0.15	0.18	0.17	49.49		83
0.4905	0.4830	.....	0.4867	0.24	0.27	0.26	.....	All sap-wood	621
0.5571	0.5680	.....	0.5626	0.32	0.31	0.32	.....		622
0.5149	0.4603	.....	0.4876	0.32	0.23	0.28	.....	All sap-wood	1169
0.5778	0.5841	0.5991	0.5870	0.29	0.34	0.32	.....		1172
			0.5309			0.30	33.09		
0.4696	0.6456	.....	0.5576	0.30	0.31	0.31	34.75		279
0.5235	0.5050	.....	0.5143	0.30	0.30	0.30	.....		321
0.4851	0.4602	.....	0.4727	0.24	0.22	0.23	.....		396
			0.4935			0.27	30.75		
0.5054	0.4831	.....	0.4942	0.26	0.25	0.26	30.80	Second sp. gr. determination made on sap-wood	671
0.5739	0.4550	.....	0.5144	0.35	0.35	0.35	.....	All sap-wood	278
0.7098	0.7569	.....	0.7333	0.22	0.22	0.22	.....	0.5 sap-wood	319
0.6086	0.6129	.....	0.6107	0.23	0.17	0.20	.....		557
0.7262	0.7232	.....	0.7247	0.33	0.31	0.32	.....		558
0.4689	0.4689	.....	0.4689	0.32	0.41	0.37	.....	All sap-wood	559
			0.6104			0.29	38.04		
0.4358	0.4235	.....	0.4297	0.40	0.61	0.50	.....	Second sp. gr. determination made on sap-wood	142
0.3232	0.3741	.....	0.3487	0.53	0.44	0.49	.....	All sap-wood	544
0.4018	0.4002	.....	0.4010	0.35	0.35	0.35	.....	All sap-wood	764
			0.3931			0.45	24.50		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
379. Pinus Banksiana *Gray Pine. Scrub Pine. Prince's Pine.*	394	Michigan	Baldwin	W. J. Beal	Low, sandy			
	780	New Brunswick		Intercolonial railway.				
	879	do		do				
380. Pinus palustris *Long-leaved Pine. Southern Pine. Georgia Pine. Yellow Pine. Hard Pine.*	81	Florida	Duval county	A. H. Curtiss	Sandy loam	0.353	25	119
	85	do	do	do	Moist, sandy	0.355	46	51
	172	Mississippi	Barney & Smith Manufacturing Co	E. E. Barney				
	243	Florida	Saw-mill, Saint John's river.	A. H. Curtiss				
	302	South Carolina	Aiken	H. W. Ravenel	Sandy loam			
	357	Alabama	Cottage Hill	C. Mohr	do			
	358	do	Citronelle	do	do			
	359	do	Chunchula	do	do			
	360	do	do	do	do			
	361	do	do	do	do			
	384	Florida	Saw-mill, Cedar Keys.	A. H. Curtiss				
	385	do	do	do				
	390	North Carolina	Wilmington	E. Kidder				
	562	Texas	Sabine county	G. W. Letterman				
	1096	Alabama	Mobile	C. Mohr				
381. Pinus Cubensis *Slash Pine. Swamp Pine. Bastard Pine. Meadow Pine.*	84	Florida	Duval county	A. H. Curtiss	Moist, sandy	0.326	58	50
	356	Alabama	Cottage Hill	C. Mohr	do			
	493	Florida	Bay Biscayne	A. H. Curtiss	Coral			
382. Picea nigra *Black Spruce.*	109	Vermont	Charlotte	C. G. Pringle	Gravelly			
	231	do	do	do	Cold, peaty			
	373	do	Huntingdon	do	Gravelly			
	776	New Brunswick	Bay of Fundy	Intercolonial railway.				
	794	Province Quebec	Danville	Grand Trunk railway.				
	880	New Brunswick	Bridgeton	Ed. Sinclair				
383. Picea alba *White Spruce.*	513	New Hampshire	Stratford	C. G. Pringle		0.186	16	22
	620	Dakota	Terry's peak	Robert Douglas	Gravelly			
	773	New Brunswick	Bay of Fundy	Intercolonial railway.				
	784	do	Bridgeton	Ed. Sinclair				
	791	Province of Quebec.	Amqui	A. Grant				
384. Picea Engelmanni *White Spruce.*	292	Colorado	Forest City	T. S. Brandegee	Damp	0.320	8	76
	575	do	do	C. S. Sargent	Peaty			
	822	do	do	T. S. Brandegee	do	0.318	45	71
	899	do		Department of Agriculture.				
	905	Utah		do				

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.4622	0.4965	.....	0.4794	0.28	0.33	0.30	.....	.....	394
.....	0.4588	.....	0.4588	0.20	0.19	0.20	.....	Sap-wood	780
0.4778	0.5065	0.4857	0.4900	0.19	0.18	0.19	.....	.....	879
			0.4761			0.23	29.67		
0.7551	0.7284	.....	0.7418	0.26	0.26	0.26	.....	.....	81
0.7117	.....	.....	0.7117	0.16	0.17	0.17	.....	.....	85
0.6927	0.6974	.....	0.6950	0.26	0.26	0.26	.....	.....	172
0.7569	0.6829	.....	0.7199	0.28	0.21	0.25	.....	.....	243
0.6139	0.5191	.....	0.5665	0.39	0.24	0.31	.....	.....	302
0.6602	0.6616	.....	0.6609	0.27	0.27	0.27	.....	.....	357
0.8652	0.9325	.....	0.8989	0.28	0.20	0.24	.....	Boxed for turpentine, 1852; chipped 10 years; abandoned, 1861.	358
0.8509	0.8450	.....	0.8479	0.15	0.16	0.16	.....	Boxed for turpentine, 1876; chipped 4 years; specimen taken along chip.	359
0.6673	0.7914	.....	0.7294	0.21	.....	0.21	.....	Boxed for turpentine, 1876; chipped 4 years; specimen taken above chip.	360
0.7590	0.7736	.....	0.7663	0.23	0.23	0.23	.....	Boxed for turpentine, 1878; chipped 2 years	361
0.6163	0.5714	.....	0.5938	0.32	0.32	0.32	.....	.....	384
0.6549	0.5924	.....	0.6236	0.28	0.28	0.28	.....	.....	385
0.4602	0.6186	0.6413	0.5734	0.29	0.34	0.32	.....	.....	390
0.7744	0.6745	.....	0.7245	0.17	0.18	0.18	.....	.....	562
0.6415	0.6490	.....	0.6453	0.19	0.26	0.22	.....	Tree boxed for turpentine 18 or 20 years ago.	1096
			0.6999			0.25	43.62		
0.6533	0.6506	.....	0.6520	0.31	0.31	0.31	.....	.....	84
0.7881	0.7340	.....	0.7611	0.16	0.15	0.16	.....	.....	356
0.8529	0.8389	0.8220	0.8379	0.30	0.31	0.31	.....	.....	493
			0.7504			0.26	46.76		
0.4576	0.4715	.....	0.4646	0.23	0.17	0.20	.....	[P. rubra]	109
0.5289	0.5256	.....	0.5272	0.25	0.27	0.26	.....	.....	231
0.4285	0.4486	.....	0.4386	0.29	0.29	0.29	.....	[P. rubra]	378
0.4780	0.4593	.....	0.4662	0.29	0.27	0.28	.....	.....	776
0.4065	0.4290	0.3907	0.4087	0.29	0.25	0.27	.....	.....	794
0.4830	0.4098	0.4425	0.4451	0.38	0.28	0.33	.....	.....	880
			0.4584			0.27	28.57		
0.4074	0.4194	.....	0.4134	0.26	0.21	0.24	.....	.....	513
0.3848	0.4034	.....	0.3941	0.42	0.38	0.40	.....	.....	620
0.4231	0.4375	.....	0.4303	0.34	0.38	0.36	.....	.....	773
0.3809	0.4188	.....	0.3999	0.32	0.31	0.32	.....	.....	784
0.3737	0.4020	.....	0.3879	0.24	0.29	0.27	.....	.....	791
			0.4051			0.32	25.25		
0.3550	0.3551	.....	0.3551	0.36	0.29	0.33	.....	.....	202
0.3365	0.3217	.....	0.3291	0.35	0.35	0.35	.....	.....	575
0.3507	0.3528	.....	0.3518	0.29	0.24	0.27	.....	Tree with gray bark	822
0.3717	0.3725	.....	0.3721	0.32	0.33	0.33	.....	.....	899
0.3195	0.3137	.....	0.3166	0.43	0.26	0.34	.....	.....	905
			0.3440			0.32	21.49		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth.	
							Sap-wood.	Heart-wood.
385. Picea pungens *White Spruce. Blue Spruce.*	269	Colorado	Alpine	T. S. Brandegee	Damp			
	270	do	do	do	do			
	901	do		Department of Agriculture.				
	906	Utah		do				
386. Picea Sitchensis *Tide-land Spruce.*	970	Alaska	Sitka	Paul Schultze				
	977	British Columbia	Saw-mill, Burrard inlet.	G. Engelmann and C. S. Sargent.				
	1015	Oregon	Weidler's mill, Portland.	do				
	1019	do	Saw-mill, Astoria	do				
	1026	do	Portland Furniture Company.	do				
387. Tsuga Canadensis *Hemlock.*	5	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.382	37	57
	219	Vermont	Charlotte	C. G. Pringle	Gravelly			
	726	Pennsylvania	Williamsport	do	Damp			
	772	New Brunswick		Intercolonial railway.				
	775	do	Bay of Fundy	do				
	778	do		do				
	787	do	Bridgeton	Ed. Sinclair				
	793	Province Quebec	Danville	Grand Trunk railway.				
	817	West Virginia	Grafton	C. G. Pringle				
	1040	Massachusetts	Danvers	J. Robinson	Moist, loam	0.230	26	92
	1042	do	North Reading	do		0.260	16	32
388. Tsuga Caroliniana *Hemlock.*	623	North Carolina	Hendersonville	A. H. Curtiss	Dry, rocky	0.228	51	14
389. Tsuga Mertensiana *Hemlock.*	971	Washington territory.	Wilkeson	G. Engelmann and C. S. Sargent.	Rich loam			
	995	Alaska	Sitka	Paul Schultze				
390. Tsuga Pattoniana	980	British Columbia	Silver peak, near Fraser river.	G. Engelmann and C. S. Sargent.	Gravelly loam			
391. Pseudotsuga Douglasii *Red Fir. Yellow Fir. Oregon Pine. Douglas Fir.*	271	Colorado	Alpine	T. S. Brandegee	Moist	0.276	40	155
	627	California	Saw-mill, Strawberry valley.	G. Engelmann and C. S. Sargent.				
	702	Oregon	Saw-mill, Marshfield	do				
	704	do	do	do				
	705	do	E. B. Dean's saw-mill, Marshfield.	do				
	706	do	do	do				
	708	do	do	do				
	709	do	do	do				
	720	Montana	Saw-mill, Missoula	S. Watson				
	732	California	Lassen's peak	Sierra Lumber Company.				
	881	Utah	Salt Lake	M. E. Jones	Rocky			
	973	British Columbia	Saw-mill, Burrard inlet.	C. S. Sargent				
	974	do	do	do				
	986	do	Saw-mill, Victoria	G. Engelmann and C. S. Sargent.				
	989	Oregon	Saw-mill, Portland	do				

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.3480	.....	.....	0.3480	0.22	.....	0.22	.....	.....	269
0.3540	0.3558	.....	0.3549	0.32	0.29	0.31	.....	.....	270
0.4309	0.4274	.....	0.4292	0.49	0.51	0.50	.....	.....	901
0.3764	0.3517	.....	0.3641	0.69	0.28	0.48	.....	.....	906
			0.3740			0.38	23.31		
0.6029	0.6485	.....	0.6257	0.23	0.24	0.24	.....	.....	970
0.3658	0.3974	.....	0.3816	0.16	0.17	0.17	.....	.....	977
0.4280	.....	.....	0.4280	0.16	0.13	0.15	.....	.....	1015
0.3520	0.3423	0.3446	0.3463	0.22	0.13	0.18	.....	.....	1019
0.3661	0.3576	.....	0.3619	0.13	0.12	0.13	.....	.....	1026
			0.4287			0.17	26.72		
0.3880	0.3896	.....	0.3888	0.24	0.25	0.25	.....	.....	5
0.4633	0.4624	.....	0.4629	0.73	0.67	0.70	.....	.....	219
0.3817	0.3823	.....	0.3820	0.43	0.36	0.40	.....	.....	720
0.3963	0.4704	.....	0.4333	0.45	0.46	0.46	.....	Red hemlock	772
0.4839	0.4707	.....	0.4773	0.34	0.42	0.38	.....	White hemlock	775
0.3418	0.3343	.....	0.3381	0.54	0.56	0.55	.....	.....	778
0.4538	0.4538	.....	0.4538	0.44	0.48	0.46	.....	.....	787
0.5039	0.5191	.....	0.5112	0.46	0.46	0.46	.....	.....	793
0.3719	0.3500	.....	0.3610	0.45	0.51	0.48	.....	.....	817
0.4213	0.4554	0.4561	0.4443	0.51	0.60	0.56	.....	.....	1040
0.4112	0.4080	0.4098	0.4097	0.52	0.31	0.42	.....	.....	1042
			0.4239			0.46	26.42		
0.4289	0.4260	.....	0.4275	0.39	0.41	0.40	26.64	.....	623
0.5671	0.4833	.....	0.5252	0.41	0.45	0.43	.....	.....	971
0.4981	0.4975	0.5411	0.5122	0.43	0.39	0.41	.....	.....	995
			0.5182			0.42	32.29		
0.4462	0.4396	0.4503	0.4454	0.34	0.53	0.44	27.76	.....	986
0.4461	0.4674	.....	0.4568	0.16	.....	0.16	.....	.....	271
0.5570	0.5653	.....	0.5612	0.10	0.06	0.08	.....	.....	627
0.4063	0.4364	.....	0.4214	0.08	0.07	0.08	.....	Coarse-grained	702
0.6332	0.6769	.....	0.6551	0.02	0.03	0.03	.....	Grown near the ocean	704
0.5215	0.5250	.....	0.5233	0.03	0.01	0.02	.....	Coarse-grained best quality	705
0.5493	0.5937	.....	0.5715	0.10	0.06	0.08	.....	Fine-grained best quality	706
0.6189	0.5785	.....	0.5987	0.02	0.03	0.03	.....	Coast fir	708
0.4254	0.3859	.....	0.4057	0.04	0.03	0.04	.....	20 miles from coast, clear yellow	709
0.5269	0.5215	.....	0.5242	0.09	0.12	0.11	.....	.....	720
0.4896	0.4941	.....	0.4918	0.12	0.13	0.13	.....	.....	732
0.5251	0.5855	.....	0.5553	0.18	0.18	0.18	.....	.....	881
0.4809	0.4679	.....	0.4744	0.05	0.06	0.06	.....	Red fir	973
0.5028	0.4848	.....	0.4938	0.05	0.04	0.05	.....	Yellow fir	974
0.4511	0.4504	.....	0.4508	0.10	0.08	0.09	.....	.....	986
0.5990	0.5922	.....	0.5956	0.10	0.11	0.11	.....	.....	980

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	Layers of growth. Sap-wood.	Layers of growth. Heart-wood.
391. Pseudotsuga Douglasii—continued	1008	British Columbia	Saw-mill, Burrard inlet.	G. Engelmann and C. S. Sargent.				
	1011	Oregon	Oregon Railway and Navigation Co.	do				
	1016	do	Weidler's saw-mill, Portland.	do				
	1018	do	Saw-mill, Astoria	do				
	1020	do	Portland Furniture Company.	do				
	1022	do	Portland Furniture Company.	do				
391. Pseudotsuga Douglasii, *var.* macrocarpa. *Hemlock.*	642	California	Saw-mill, San Bernardino.	W. G. Wright				
392. Abies Fraseri *Balsam. She Balsam.*	523	North Carolina	Roan mountain	Walcott Gibbs	Peaty loam	0.180	46	
393. Abies balsamea *Balsam Fir. Balm of Gilead Fir.*	107	Vermont	Green mountains	C. G. Pringle	Cold, gravelly loam			
	377	do	Monkton	do	Peaty			
394. Abies subalpina *Balsam.*	449[1]	Colorado	Forest City	T. S. Brandegee	Moist, sandy loam			
	449[2]	do	do	do	do			
	820	do	do	do	do	0.344	17	155
395. Abies grandis *White Fir.*	959, 1009, 1010	Oregon	Portland	G. Engelmann and C. S. Sargent.	Rich, alluvial	0.735	56	43
396. Abies concolor *White Fir. Balsam Fir.*	529	Colorado	Engelmann's cañon	Robert Douglas	Rocky	0.196	29	
	580	California	Strawberry valley	G. Engelmann and C. S. Sargent.	Alluvial			
	639	do	do	do	do			
	733	do	Lassen's peak	Sierra Lumber Company.				
397. Abies bracteata	572	do	Santa Lucia mountains.	G. R. Vasey				
398. Abies amabilis	1004	British Columbia	Silver peak, near Fraser river.	G. Engelmann and C. S. Sargent.	Rich, sandy loam	0.584	50	120
399. Abies nobilis *Red Fir.*	965	Oregon	Cascade mountains	do	Rich			
400. Abies magnifica *Red Fir.*	647	California	Soda Springs	do	Gravelly loam	1.324	71	267
401. Larix Americana *Larch. Black Larch. Tamarack. Hackmatack.*	226[1]	Vermont	Charlotte	C. G. Pringle	Cold, swampy			
	226[2]	do	do	do	do			
	226[3]	do	do	do	do			
	774	New Brunswick	Bay of Fundy	Intercolonial railway.				
	781	do		do				
	786	do	Bridgeton	Ed. Sinclair				
	795	do	Danville	Grand Trunk railway.				
	840	Massachusetts	Wenham	J. Robinson	Swampy			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			Weight, per cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.5266	.....	.....	0.5266	0.03	0.04	0.04	.....	.....	1008
0.4902	0.4867	.....	0.4885	0.03	0.03	0.03	.....	Railroad tie.	1011
0.5831	0.5599	.....	0.5715	0.11	0.07	0.09	.....	.....	1016
0.5660	0.5725	.....	0.5692	0.05	0.04	0.05	.....	.....	1018
0.4331	0.4422	.....	0.4377	0.07	0.11	0.09	.....	.....	1020
0.4562	0.4588	.....	0.4575	0.06	0.07	0.07	.....	.....	1022
			0.5157			0.08	32.14		
0.4664	0.4463	.....	0.4563	0.08	0.08	0.08	28.44	.....	642
0.3699	0.3431	.....	0.3565	0.47	0.60	0.54	22.22	.....	523
0.3386	0.3342	.....	0.3364	0.63	0.49	0.56	.....	.....	107
0.4248	0.4299	.....	0.4273	0.33	0.35	0.34	.....	.....	377
			0.3819			0.45	23.80		
0.3446	0.3515	.....	0.3481	0.66	.....	0.66	.....	.....	449[1]
0.3442	0.3641	.....	0.3541	0.33	.....	0.33	.....	.....	449[2]
0.3475	0.3397	0.3342	0.3405	0.34	0.33	0.34	.....	.....	820
			0.3476			0.44	21.66		
0.3416	0.3371	.....		0.38	0.32				959
0.3643	0.3842	0.3531	0.3545	0.63	0.57	0.49	21.97	One tree	1009
0.3390	0.3625	.....		0.56	0.47				1010
0.3613	0.3717	.....	0.3665	0.87	0.89	0.88	.....	.....	529
0.3059	0.2910	.....	0.2985	1.12	1.12	1.12	.....	.....	580
0.3286	0.3780	.....	0.3533	0.56	0.48	0.52	.....	.....	639
0.4242	0.4500	.....	0.4371	0.70	1.04	0.87	.....	.....	733
			0.3638			0.85	22.67		
0.7082	0.6483	.....	0.6783	2.09	1.99	2.04	42.27	.....	572
0.4297	0.4159	.....	0.4228	0.25	0.21	0.23	26.35	.....	1004
0.4625	0.4497	.....	0.4561	0.27	0.41	0.34	28.42	.....	965
0.4752	0.4614	0.4738	0.4701	0.30	0.30	0.30	29.30	.....	647
0.6973	0.7075	.....	0.7024	0.26	.....	0.26	.....	.....	226[1]
0.6945	0.7779	.....	0.7362	0.27	.....	0.27	.....	.....	226[2]
0.6835	0.6069	.....	0.6452	0.32	.....	0.32	.....	.....	226[3]
0.5975	0.5765	.....	0.5870	0.30	0.27	0.28	.....	.....	774
0.5925	0.5740	.....	0.5833	0.47	0.49	0.48	.....	.....	781
0.5389	0.5570	.....	0.5479	0.35	0.30	0.33	.....	.....	786
0.5882	0.5864	.....	0.5873	0.36	0.32	0.34	.....	.....	795
.....	.....	0.6000	0.6000	0.27	0.48	0.38	.....	.....	840
			0.6236			0.33	38.86		

TABLE I.—SPECIFIC GRAVITY, ASH, AND WEIGHT PER CUBIC FOOT

Species.	Office number.	State.	Locality.	Collector.	Soil.	Diameter of tree, in meters.	LAYERS OF GROWTH.	
							Sap-wood.	Heart-wood.
402. Larix occidentalis *Tamarack.*	719	Montana	Missoula	S. Watson				
	984	Washington territory.	Fulda	William N. Siksdorf	Moist			
	1006	do	do	do				
PALMACEÆ.								
404. Sabal Palmetto *Cabbage Tree. Cabbage Palmetto.*	242	Florida	Sister island	A. H. Curtiss	Shell			
405. Washingtonia filifera *Fan-leaf Palm.*	1159	California	Agua Caliente	W. G. Wright	Dry, gravelly			
406. Thrinax parviflora *Silk-top Palmetto.*	504	Florida	Long Key	A. H Curtiss	Coral			
	1107	do	Bahia Honda Key	do	do			
407. Thrinax argentea *Silver-top Palmetto. Brickley Thatch. Brittle Thatch.*	506	do	Sugar-loaf Sound	do	do			
	1116	do	No-Name Key	do	do			
408. Oreodoxa regia *Royal Palm.*	565	do	Big Cypress	do	Rich humus			
	1119	do	Lost Man's river	do	do			
LILIACEÆ.								
409. Yucca canaliculata *Spanish Bayonet.*	1063	Texas	Matagorda	C. Mohr	Sandy, saline			
410. Yucca brevifolia *The Joshua. Joshua Tree.*	695	California	Mohave	G. Engelmann and C. S. Sargent.	Dry, gravelly			
	696	do	do	do	do			
411. Yucca elata *Spanish Bayonet.*	699	Arizona	Tucson	do	do			
412. Yucca baccata *Spanish Bayonet. Mexican Banana.*	1003	California	San Diego	G. Engelmann	do			

OF DRY SPECIMENS OF THE WOODS OF THE UNITED STATES—Continued.

SPECIFIC GRAVITY DETERMINATIONS.				ASH DETERMINATIONS.			*Weight, per* cubic foot, in pounds (average).	Remarks.	Office number.
First.	Second.	Third.	Average.	First.	Second.	Average.			
0.6603	0.5897	.....	0.6280	0.08	0.09	0.09	.....	.....	719
0.7717	0.7839	.....	0.7778	0.09	0.09	0.09	.....	.....	984
0.8340	0.7984	.....	0.8162	0.07	0.12	0.09	.....	.....	1006
			0.7407			0.09	46.16		
0.5002	0.4020	0.4191	0.4404	7.51	7.80	7.66	27.44	.....	242
0.5597 0.4700	0.4942 0.5453	.....	0.5173	1.80	1.98	1.89	32.24	.....	1159
0.7014	0.7258	.....	0.7136	2.65	2.79	2.72	.....	.....	504
0.4539	0.4957	0.5039	0.4845	5.73	4.81	5.27	.....	.....	1107
			0.5991			3.99	37.34		
0.7357	0.7468	.....	0.7412	1.71	2.19	1.95	.....	.....	506
0.6775	0.6907	0.7118	0.6933	3.90	4.25	4.07	.....	.....	1116
			0.7172			3.01	44.70		
0.2370	0.1887	.....	0.2128	2.96	2.52	2.74	.....	Pith .. } One tree	565
0.8178	0.8807	.....	0.8492	1.31	1.14	1.23	.....	Rind .. } One tree	
0.7451	0.7513	.....	0.7482	2.79	2.53	2.66	.....	Rind	1119
			0.6034			2.21	37.60		
0.7162	0.5875	0.6994	0.6677	7.03	5.52	6.27	41.61	.....	1063
0.3473	0.3472	.....	0.3472	5.53	4.75	5.14	.....	.....	695
0.4002	0.4002	.....	0.4002	2.66	3.08	2.87	.....	.....	696
			0.3737			4.00	23.29		
0.2327	0.6511	0.4572	0.4470	8.50	10.06	9.28	27.86	.....	699
0.1990	0.3458	.....	0.2724	8.94	.....	8.94	16.97	.....	1003

TABLE II.—ACTUAL FUEL VALUE OF SOME OF THE

Office number.	Catalogue number.	Botanical name.	Common name.	Region.	FUEL VALUE. Per cubic decimeter.	FUEL VALUE. Per kilogram.
165	8	Liriodendron Tulipifera	Tulip Tree. Yellow Poplar. White Wood	Atlantic	1425.57	3744.61
903	29	Bursera gummifera	Gum Elemi. Gumbo Limbo. West Indian Birch	Semi-tropical Florida	997.32	2913.58
452	31	Swietenia Mahogoni	Mahogany. Madeira	do	2769.31	3802.95
274	64	Acer saccharinum, *var.* nigrum	Black Sugar Maple	Atlantic	3091.37	4345.48
845	77	Robinia Pseudacacia	Locust. Black Locust. Yellow Locust	do	2822.99	3890.02
927	93	Prosopis juliflora	Mesquit. Algaroba. Honey Locust. Honey Pod.	Mexican boundary	3291.21	4352.30
883	115	Cercocarpus ledifolius	Mountain Mahogany	Interior Pacific	4234.06	4052.90
1182	139	Liquidambar Styraciflua	Sweet Gum. Star-leaved Gum. Liquidamber. Red Gum. Bilsted.	Atlantic	2255.24	4016.46
128	155	Nyssa uniflora	Large Tupelo. Cotton Gum. Tupelo Gum	Southern Atlantic	2332.41	4131.83
1084	184	Diospyros Virginiana	Persimmon	Atlantic	2970.45	3781.61
227	192	Fraxinus Americana	White Ash	do	2652.34	4217.42
180	207	Catalpa speciosa	Western Catalpa	do	1582.42	3936.38
533	224	Ulmus Americana	White Elm. American Elm. Water Elm	do	3247.02	4191.87
126	235	Platanus occidentalis	Sycamore. Button Wood. Button-ball Tree. Water Beech.	do	2406.89	4071.83
209	239	Juglans nigra	Black Walnut	do	1984.56	3857.26
322	241	Carya olivæformis	Pecan. Illinois Nut	do	2763.72	3954.75
29	242	Carya alba	Shell-bark Hickory. Shag-bark Hickory	do	3851.17	4078.76
539					3319.79	3811.48
72	244	Carya tomentosa	Mocker Nut. Black Hickory. Bull Nut. Big-bud Hickory. White-heart Hickory. King Nut.	do	3380.57	3904.11
1051	245	Carya porcina	Pig Nut. Brown Hickory. Black Hickory. Switch-bud Hickory.	do	3392.12	3922.89
838	246	Carya amara	Bitter Nut. Swamp Hickory	do	2863.42	3903.25
237	247	Carya myristicæformis	Nutmeg Hickory	Southern Atlantic	3108.27	3877.58
362	248	Carya aquatica	Water Hickory. Swamp Hickory. Bitter Pecan	do	3140.33	4073.59
1050	251	Quercus alba	White Oak	Atlantic	3197.41	4187.83
988	253	Quercus Garryana	do	Northern Pacific	2594.31	3667.39
424	257	Quercus lyrata	Over-cup Oak. Swamp Post Oak. Water White Oak.	Southern Atlantic	3268.92	4105.65
31	260	Quercus Prinus	Chestnut Oak. Rock Chestnut Oak	do	2843.69	3997.32
92	272	Quercus rubra	Red Oak. Black Oak	Atlantic	3062.08	4075.16
247	274	Quercus tinctoria	Black Oak. Yellow-bark Oak. Quercitron Oak. Yellow Oak.	do	2595.04	3774.60
339	276	Quercus nigra	Black Jack. Jack Oak	do	2692.51	3713.81
548	277	Quercus falcata	Spanish Oak. Red Oak	Southern Atlantic	3193.28	4055.48
511	280	Quercus aquatica	Water Oak. Duck Oak. Possum Oak. Punk Oak	do	2655.82	3718.07
868	290	Castanea vulgaris, *var.* Americana	Chestnut	Atlantic	1868.25	4042.96
55	291	Fagus ferruginea	Beech	do	2795.34	3895.04
848	294	Betula alba, *var.* populifolia	White Birch. Old-field Birch. Gray Birch	Northern Atlantic	2509.00	4073.05
225	295	Betula papyrifera	Canoe Birch. White Birch. Paper Birch	do	2582.66	4101.41
272	318	Populus tremuloides	Aspen. Quaking Asp	Atlantic and Pacific	1624.64	4292.31
754	324	Populus monilifera	Cottonwood. Necklace Poplar. Carolina Poplar. Big Cottonwood.	Atlantic	1906.42	4242.15
874	327	Thuya occidentalis	White Cedar. Arbor-vitæ	Northern Atlantic	1411.57	3917.77
701	331	Chamæcyparis Lawsoniana	Port Orford Cedar. Oregon Cedar. White Cedar. Lawson's Cypress. Ginger Pine.	Northern Pacific	2327.52	5263.50
527	338	Juniperus occidentalis, *var.* monosperma.	Juniper	Pacific	3143.57	4587.81
923	340	Taxodium distichum	Bald Cypress. Black Cypress. Red Cypress. White Cypress. Deciduous Cypress.	Southern Atlantic	1935.71	4739.73
711	342	Sequoia sempervirens	Redwood	California coast	1985.50	4191.47
1044	347	Pinus Strobus	White Pine. Weymouth Pine	Northern Atlantic	1489.03	4272.69
638	349	Pinus Lambertiana	Sugar Pine	Pacific	1785.40	4419.31
900	356	Pinus monophylla	Piñon. Nut Pine	Interior Pacific	2248.13	4107.68
194	358	Pinus resinosa	Red Pine. Norway Pine	Northern Atlantic	2051.75	4226.05
632	361	Pinus ponderosa	Yellow Pine. Bull Pine	Pacific	2441.24	4600.04
625	365	Pinus Murrayana	Tamarack. Black Pine. Lodge-pole Pine. Spruce Pine.	do	1791.32	4019.12
571	366	Pinus Sabiniana	Digger Pine. Bull pine	California	1804.29	3982.97
389	370	Pinus Tæda	Loblolly Pine. Old-field Pine. Rosemary Pine	Southern Atlantic	2031.75	4087.20
1046	371	Pinus rigida	Pitch Pine	Atlantic coast	3472.26	5491.47
83	372	Pinus serotina	Pond Pine	Southern Atlantic	3980.96	5012.54
621	373	Pinus inops	Jersey Pine. Scrub Pine	Atlantic	2008.20	4126.15
321	375	Pinus pungens	Table-mountain Pine. Hickory Pine	Alleghany	2054.78	3995.30
557	377	Pinus mitis	Yellow Pine. Short-leaved Pine. Spruce Pine. Bull Pine.	Atlantic	3091.82	5062.75

MORE IMPORTANT WOODS OF THE UNITED STATES.

RELATIVE FUEL VALUE.		PERCENTAGE IN DRY WOOD.								
By volume.	By weight.	Ash.	Hydrogen.	Carbon.	Oxygen.	Hydrogen combined with oxygen.	Excess of hydrogen.	Specific gravity.	Weight of cubic foot, in pounds.	Office number.
67	66	0.27	6.43	47.29	46.01	5.75	0.68	0.3807	23.72	165
69	70	2.09	6.02	40.80	51.09	6.39	0.36	0.3423	21.33	903
92	62	1.09	6.69	46.76	45.46	5.68	1.01	0.7282	45.38	452
23	19	0.56	6.61	51.55	41.28	5.16	1.45	0.7114	44.32	274
20	58	0.23	6.17	49.19	44.41	5.55	0.62	0.7257	45.22	845
14	18	2.05	6.61	51.08	40.26	5.03	1.58	0.7562	47.12	927
3	42	1.20	5.45	52.14	41.21	5.15	0.30	1.0447	65.10	883
45	46	0.48	5.85	50.99	42.68	5.33	0.52	0.5615	34.99	1182
43	30	0.74	6.97	48.78	43.51	5.44	1.53	0.5645	35.17	128
25	63	0.77	6.44	47.37	45.42	5.67	0.77	0.7855	48.95	1084
36	24	0.30	6.93	49.73	43.04	5.38	1.55	0.6289	39.19	227
65	52	0.47	6.92	47.44	45.17	5.65	1.27	0.4020	25.05	180
10	26	0.74	6.57	50.35	42.34	5.29	1.28	0.7746	48.27	533
42	40	0.57	5.83	51.45	42.15	5.27	0.56	0.5911	36.83	126
53	60	0.56	6.00	49.28	44.16	5.52	0.48	0.5145	32.06	209
33	50	0.95	6.15	49.51	43.39	5.42	0.73	0.7001	43.63	322
7	36	0.73	6.49	49.67	43.12	5.39	1.10	0.9442	58.84	29
13	61	0.83	6.13	48.45	44.59	5.57	0.56	0.8710	54.28	539
11	55	1.04	5.93	49.69	43.34	5.42	0.51	0.8659	53.95	72
10	53	0.74	6.28	48.98	44.00	5.50	0.78	0.8647	53.88	1051
27	56	1.03	5.91	49.71	43.29	5.41	0.50	0.7336	45.71	838
21	59	1.06	6.37	48.26	44.31	5.54	0.83	0.8016	49.95	237
20	38	1.19	6.60	49.16	43.05	5.38	1.22	0.7709	48.04	362
17	28	0.24	6.59	50.44	42.73	5.34	1.25	0.7635	46.58	1050
38	69	0.33	5.73	48.56	45.38	5.67	0.06	0.7074	44.08	988
15	33	0.58	6.75	49.22	43.45	5.43	1.32	0.7962	49.61	424
28	47	0.34	6.33	49.59	43.74	5.47	0.86	0.7114	44.32	31
24	37	0.15	6.62	49.49	43.74	5.47	1.15	0.7514	46.72	92
37	64	0.15	6.09	48.78	44.98	5.62	0.87	0.6875	43.84	247
34	68	1.37	5.73	48.58	44.32	5.54	0.19	0.7250	45.18	339
18	41	0.29	6.14	50.58	42.99	5.37	0.77	0.7874	49.07	548
35	67	0.83	5.75	48.73	44.69	5.58	0.17	0.7143	44.51	511
56	43	0.13	5.70	51.74	42.43	5.30	0.40	0.4621	28.80	868
31	57	0.54	6.11	49.27	44.08	5.51	0.60	0.7175	44.71	55
40	39	0.29	6.49	49.77	43.45	5.43	1.06	0.6160	38.05	848
39	34	0.23	7.12	48.28	44.37	5.54	1.58	0.6207	39.24	225
63	20	0.74	6.58	51.13	41.55	5.19	1.39	0.3785	23.59	272
55	22	0.65	6.26	51.64	41.45	5.18	1.08	0.4494	28.00	754
68	54	0.37	6.37	48.80	44.46	5.56	0.81	0.3603	22.45	874
44	3	0.10	6.28	60.07	33.65	4.21	2.07	0.4422	27.56	701
19	11	0.88	6.03	54.97	38.12	4.76	1.27	0.6852	42.70	527
54	8	0.40	6.54	54.98	38.08	4.76	1.78	0.4084	24.45	923
52	27	0.13	6.01	52.10	41.70	5.22	0.79	0.4737	29.52	711
66	21	0.12	6.08	52.55	41.25	5.15	0.93	0.3485	21.72	1044
50	13	0.19	6.40	52.85	40.56	5.07	1.33	0.4040	25.18	638
46	32	0.83	6.39	50.48	43.30	5.41	0.98	0.5473	34.11	900
49	23	0.20	6.07	52.18	41.55	5.19	0.88	0.4855	30.26	194
41	9	0.31	7.02	52.60	40.07	5.01	2.01	0.5307	33.07	632
58	45	0.37	6.22	50.05	43.36	5.42	0.80	0.4457	27.78	625
57	49	0.42	6.04	50.22	43.32	5.41	0.63	0.4530	28.28	571
50	35	0.25	6.23	50.60	42.92	5.36	0.87	0.4971	30.98	389
9	1	1.12	7.19	59.00	32.68	4.08	3.11	0.6323	39.40	1046
6	6	0.17	6.80	56.55	36.48	4.56	2.24	0.7942	49.49	83
51	31	0.26	6.30	50.74	42.70	5.34	0.96	0.4867	30.33	321
48	48	0.30	5.78	51.07	42.85	5.35	0.43	0.5143	32.05	321
22	5	0.20	6.91	56.64	36.25	4.53	2.38	0.6107	38.06	557

TABLE II.—ACTUAL FUEL VALUE OF SOME OF THE

Office number.	Catalogue number.	Botanical name.	Common name.	Region.	FUEL VALUE. Per cubic decimeter.	FUEL VALUE. Per kilogram.
879	379	Pinus Banksiana	Gray Pine. Scrub Pine. Prince's Pine	Northern Atlantic	2152.66	4393.18
a 359	380	Pinus palustris	Long-leaved Pine. Southern Pine. Georgia Pine. Yellow Pine. Hard Pine.	South Atlantic coast	4346.88	5126.04
81					4064.77	5480.35
385					2810.20	4506.42
b 358					4129.95	4594.97
358					4319.67	4806.05
356	381	Pinus Cubensis	Slash Pine. Swamp Pine. Bastard Pine. Meadow Pine.	do	3363.40	4418.55
794	382	Picea nigra	Black Spruce	Northern Atlantic	1614.11	3949.37
1042	387	Tsuga Canadensis	Hemlock	do	1724.25	4298.58
709	391	Pseudotsuga Douglasii	Red Fir. Yellow Fir. Oregon Pine. Douglas Fir.	Pacific	1766.32	4354.84
226	401	Larix Americana	Larch. Black Larch. Tamarack. Hackmatack.	Northern Atlantic	2937.46	4182.04
242	404	Sabal Palmetto	Cabbage Tree. Cabbage Palmetto	South Atlantic coast	1653.35	3754.21
c 565	408	Oreodoxa regia	Royal Palm	Semi-tropical Florida	859.07	4037.01
d 565					3708.48	4367.03

a Boxed for turpentine 1876; chipped 4 years; specimen taken along chip.
b Boxed for turpentine 1852; chipped 10 years; abandoned 1861.
c Pith.
d Rind.

MORE IMPORTANT WOODS OF THE UNITED STATES—Continued.

RELATIVE FUEL VALUE.		PERCENTAGE IN DRY WOOD.						Specific gravity.	Weight of cubic foot, in pounds.	Office number.
By volume.	By weight.	Ash.	Hydrogen.	Carbon.	Oxygen.	Hydrogen combined with oxygen.	Excess of hydrogen.			
47	15	0.19	6.29	52.93	40.59	5.07	1.22	0.4900	30.54	879
1	4	0.15	7.26	56.19	36.30	4.54	2.72	0.8479	52.84	359
5	2	0.26	7.41	58.61	33.72	4.21	3.20	0.7417	46.22	81
30	12	0.28	6.70	52.70	40.32	5.04	1.66	0.6236	38.86	385
4	10	0.28	6.85	52.99	39.88	4.99	1.86	0.8988	55.96	358
2	7	0.24	6.83	54.78	38.15	4.77	2.06	0.8988	55.96	358
12	14	0.16	6.22	53.33	40.29	5.03	1.19	0.7612	47.44	356
64	51	0.30	6.58	48.45	44.67	5.58	1.00	0.4087	25.47	794
61	25	0.48	5.91	52.38	41.23	5.15	0.76	0.4097	25.53	1042
60	17	0.03	6.42	52.32	41.23	5.15	1.27	0.4056	25.28	709
26	29	0.27	6.03	51.91	41.79	5.22	0.81	0.7024	43.77	226
62	65	7.66	7.06	43.35	41.93	5.24	1.82	0.4404	27.45	242
70	44	2.74	6.82	47.73	42.71	5.34	1.48	0.2128	13.26	565
8	16	1.24	6.98	50.46	41.32	5.16	1.82	0.8492	52.92	565

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
MAGNOLIACEÆ.										
1. Magnolia grandiflora *Big Laurel. Bull Bay.*	346	Alabama	Cottage Hill	C. Mohr	Rich loam	0.7051		1061	957	820
	346	do	do	do	do	0.7006		887	849	761
2. Magnolia glauca *Sweet Bay. White Bay. Beaver Tree. White Laurel. Swamp Laurel.*	354	do	do	do	Swampy	0.5222		976	930	732
	354	do	do	do	do	0.5028		976	896	717
3. Magnolia acuminata *Cucumber Tree. Mountain Magnolia.*	246	Virginia	Wytheville	H. Shriver	Clay limestone	0.5000		904	1061	703
	246	do	do	do	do	0.4755		939	921	665
	261[1]	do	Fancy Gap	do	Rich, light	0.4862		788	734	574
	261[1]	do	do	do	do	0.4564		729	723	525
	534	Mississippi	Selvers' mill	C. Mohr	do	0.5682		1061	1050	717
	534	do	do	do	do	0.5852		1109	1085	839
4. Magnolia cordata *Cucumber Tree.*	1178	Alabama	Winston county	do		0.4318		888	864	564
	1178	do	do	do		0.4625		976	1017	637
5. Magnolia macrophylla *Large-leaved Cucumber Tree.*	532	Mississippi	Quitman	do	Rich, low	0.5807		1101	1085	516
	532	do	do	do	do	0.5580		1252	1252	876
6. Magnolia Umbrella *Umbrella Tree. Elk Wood.*	266[1]	Virginia	Wytheville	H. Shriver		0.4170		800	814	553
	266[2]	do	do	do		0.5051		669	673	612
7. Magnolia Fraseri *Long-leaved Cucumber Tree.*	260	do	Fancy Gap	do	Damp	0.5688		939	976	811
	260[1]	do	do	do	do	0.5103		887	912	602
8. Liriodendron Tulipifera *Tulip Tree. Yellow Poplar. White Wood.*	395	Michigan	Lansing	W. J. Beal		0.4174		610	610	473
	818	West Virginia	Grafton	C. G. Pringle		0.4930		1085	1176	756
	818	do	do	do		0.4809		1085	1050	675
	1231	Pennsylvania	Chester county	P. P. Sharples		0.4704		976	976	743
	1231	do	do	do		0.4911		921	1007	820
	1231	do	do	do		0.4619		976	957	755
	1232	do	do	do		0.4381		976	848	457
	1232	do	do	do		0.4511		976	1028	722
	1232	do	do	do		0.4550		904	921	661
	1236	Tennessee	Saw-mill at Nashville.	A. E. Baird		0.4614		888	834	694
	1236	do	do	do		0.4697		872	888	645
	1236	do	do	do		0.4591		888	849	584
	1237	do	do	do		0.4386		857	849	584
	1238	do	do	do		0.4463		976	976	635
ANONACEÆ.										
9. Asimina triloba *Papaw. Custard Apple.*	211	Missouri	Meramec river, Jefferson county.	G. W. Letterman	Alluvial	0.3634		444	407	312
	211	do	do	do	do	0.3575		362	315	288
	332	Tennessee	Cumberland river	A. Gattinger	do	0.4923		698	723	574
10. Anona laurifolia *Pond Apple.*	479	Florida	Bay Biscayne	A. H. Curtiss	Swampy	0.5705		542	514	628
	479	do	do	do	do	0.5794		530	488	586
CANELLACEÆ.										
12. Canella alba *White Wood. Cinnamon Bark. Wild Cinnamon.*	1131	do	Elliott's Key	do	Coral	1.1286		1085	1085	905
	1131	do	do	do	do	1.0857		1085	1148	1148
TERNSTRŒMIACEÆ.										
14. Gordonia Lasianthus *Loblolly Bay. Tan Bay.*	236	South Carolina	Bonneau's Depot	H. W. Ravenel	Wet pine-barren	0.4844		718	723	499
	236	do	do	do	do	0.4729		787	763	671
	414	do	Aiken	do	Swampy	0.5470		838	921	773
	414	do	do	do	do	0.5605		751	769	729

UNITED STATES UNDER TRANSVERSE STRAIN.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
4.6	10.2	16.0	22.8	1.6	22.5	30.5	39.5	54.6					350	Broke suddenly with long splinters	346
5.5	11.5	16.7	23.4	2.0	23.6	31.2	40.5						325	do	346
5.0	10.5	16.0	21.7	1.0	22.0	30.0	44.5						321	Crushed at center bearing; broke suddenly and squarely, splitting to the end.	354
5.0	10.9	16.7	24.0	2.3	24.0	31.5	50.8						306	do	354
5.4	9.2	14.5	20.0	1.0	20.0	28.8	46.0						300	Crushed at center bearing; broke with fine splinters	246
5.2	10.6	17.0	24.0	1.9	25.0	33.7							284	do	246
6.2	13.3	21.0	34.3	4.8	35.0								245	do	261[1]
6.7	13.5	21.0	31.8	3.4	33.0								224	do	261[1]
4.6	9.3	14.5	20.0	1.0	20.0	27.0							306	do	534
4.4	9.0	13.7	19.2	0.7	19.2	26.0	35.0	54.0					358	do	534
5.5	11.3	17.3	26.1	2.0	27.0								240	Crushed at center bearing; square break	1178
5.0	9.6	13.2	22.0	1.4	23.0	32.4							272	Crushed at center bearing; splintered break	1178
4.1	9.0	13.8	19.2	1.0	19.5								220	Specimen cross-grained; started at knot	532
3.9	7.8	11.6	15.8	0.3	15.8	20.8	28.5	40.0					374	Broke with fine splinters	532
6.1	12.0	19.4	30.8	4.5	32.4								236	Splinters started at small knots	266[1]
7.3	14.5	23.0	34.8	4.0	36.2	66.0							261	do	266[2]
5.2	10.0	14.4	19.6	1.0	20.0	26.3	37.2						346	Crushed at center bearing; broke with fine splinters	260
5.5	10.7	16.4	24.7	2.0	25.5	36.8							257	Specimen cross-grained; broke with long splinters	260[1]
8.0	16.0	26.0											202	Square break	395
4.5	8.3	12.0	16.8	0.4	16.9	24.5	34.0						322	Broke with long splinters	818
4.5	9.3	14.3	20.0	0.7	20.2	28.8							288	Crushed at center bearing; broke with long splinters	818
5.0	10.0	15.0	20.6	0.5	20.7	28.0	37.7						317	Crushed at center bearing; broke with large splinters	1231
5.3	9.7	14.4	20.0	0.5	20.5	25.8	34.2	50.0					350	do	1231
5.0	10.2	15.2	20.6	0.5	20.6	27.0	37.7						322	Crushed at center bearing; square break	1231
5.0	11.5	18.0											195	Crushed at center bearing; square break at large knot	1232
5.0	*9.5*	*14.0*	*19.2*	*0.5*	*19.4*	*25.4*	*36.0*						*308*	*Crushed at center bearing; broke with fine splinters*	1232
5.4	10.6	15.7	21.5	0.6	22.0	30.0							282	Crushed at center bearing; broke with long splinters at knot	1232
6.0	11.7	16.0	22.0	1.0	22.4	31.5							296	Square break on tension side, splitting in axis	1236
5.6	11.0	16.0	23.0	1.4	23.5	33.0							275	Specimen cross-grained; broke with the grain	1236
5.5	11.5	17.5	26.6	2.0	27.0								249	Specimen cross-grained; started at the angle of two faces	1236
5.7	11.5	17.2	27.0	2.5	28.0								249	Square break	1237
5.0	10.0	15.2	22.2	1.5	22.4	31.6							271	do	1238
11.0	24.0												133	Broke with large splinters	211
13.5	31.0												123	do	211
7.0	13.5	21.6	31.0	2.9	33.3								245	Broke with splinters at knot	332
9.0	19.0	31.0	50.5	10.0	55.4	94.0							268	Crushed at center bearing; broke with splinters	479
9.2	20.0	32.5	51.5	10.0	54.3	83.0							250	Square break	479
4.5	9.0	13.7	18.5	1.0	19.5	25.0	31.0	38.0					386	Specimen defective, 0.75 sap-wood; square break	1131
4.5	8.5	12.5	17.5	0.8	17.8	22.0	28.0	34.0	42.0	50.0			490	0.75 sap-wood; broke with long, coarse splinters	1131
6.8	13.5	21.5	32.0	3.0	32.5								213	Sap-wood; broke at knot with large splinters	236
6.2	12.8	20.0	29.2	2.5	30.0	40.0							290	Crushed at center bearing; broke with long, fine splinters	236
5.5	10.6	16.3	23.5	1.2	23.7	31.0	44.0						330	do	414
6.5	12.7	19.5	27.0	2.0	28.2	37.0	58.0						311	Broke with long, coarse splinters	414

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
TILIACEÆ.										
17. Tilia Americana *Lime Tree. Bass Wood. American Linden. Lin. Bee Tree.*	2	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.4601		814	781	569
	252	Missouri	Allenton	G. W. Letterman	Alluvial	0.4668		976	976	616
	252	do	do	do	do	0.5496		1038	1027	804
	316	Michigan	Hersey	W. J. Beal	Rich loam	0.4517		888	888	525
	1039	Massachusetts	Danvers	J. Robinson	Moist gravel	0.4492		698	729	553
	1039	do	do	do	do	0.4237		668	638	469
17. Tilia Americana, *var.* pubescens	745	Georgia	Bainbridge	A. H. Curtiss	Low	0.4702		842	834	569
	745	do	do	do	do	0.4555		814	788	548
18. Tilia heterophylla *White Bass Wood. Wahoo.*	285[1]	Kentucky	Cliffs Kentucky river	W. M. Linney	Limestone	0.4017		697	634	.403
	285[2]	do	Mercer county	do	do	0.3944		751	723	525
	285[3]	do	do	do	do	0.3926		827	814	541
	320	Tennessee	Cumberland river	A. Gattinger	Alluvial	0.4750		1085	1085	703
	320	do	do	do	do	0.4924		976	976	712
MALPIGHIACEÆ.										
19. Byrsonima lucida *Tallowberry. Glamberry.*	1113	Florida	No-Name Key	A. H. Curtiss	Coral	0.6516		542	525	424
ZYGOPHYLLACEÆ.										
20. Guaiacum sanctum *Lignum-vitæ.*	476	do	Upper Metacombe Key.	do	do	1.1430		800	814	628
	1133	do	Elliott's Key	do	do	1.1582		856	912	947
RUTACEÆ.										
23. Xanthoxylum Clava-Herculis *Toothache Tree. Prickly Ash. Sea Ash. Pepper Wood. Wild Orange.*	735	do	Chattahoochee	do	Dry, sandy	0.5240		651	698	628
	735	do	do	do	do	0.5353		669	688	708
	1086	Texas	Palestine	C. Mohr	Damp, sandy	0.5898		857	888	757
	1086	do	do	do	do	0.5545		659	630	469
24. Xanthoxylum Caribæum *Satin Wood.*	1140	Florida	Bahia Honda Key	A. H. Curtiss	Coral	0.9833		814	814	820
	1140	do	do	do	do	0.9545		814	921	687
SIMARUBEÆ.										
28. Simaruba glauca *Paradise Tree.*	487	do	Bay Biscayne	do	do	0.4560		888	888	586
	487	do	do	do	do	0.4104		1061	976	544
BURSERACEÆ.										
29. Bursera gummifera *Gum Elemi. Gumbo Limbo. West Indian Birch.*	462	do	Upper Metacombe Key.	do	do	0.3060		417	.....	183
	462	do	do	do	do	0.3096		.....	.....	112
30. Amyris sylvatica *Torch Wood.*	475	do	do	do	do	1.1140		1038	1085	1244
	475	do	do	do	do	1.1273		976	1085	1366
MELIACEÆ.										
31. Swietenia Mahogoni *Mahogany. Madeira.*	452	do	do	do	do	0.8364		976	976	895
	452	do	do	do	do	0.8221		1109	1148	1111
ILICINEÆ.										
33. Ilex opaca *American Holly.*	280	South Carolina	Waverly Mills	W. St. J. Mazyck	Sandy loam	0.6990		651	622	703
	280	do	do	do	do	0.7018		707	664	670
34. Ilex Dahoon *Dahoon. Dahoon Holly.*	484	Florida	Bay Biscayne	A. H. Curtiss	Low, damp	0.5307		610	610	586
	484	do	do	do	do	0.5333		697	673	558
CYRILLACEÆ.										
37. Cyrilla racemiflora *Iron Wood.*	341	Alabama	Chunchula	C. Mohr	Damp, sandy	0.6910		465	488	314
38. Cliftonia ligustrina *Titi. Iron Wood. Buckwheat Tree.*	338	do	Cottage Hill	do	Wet	0.6062		698	751	574
	338	do	do	do	do	0.6762		814	814	478

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
6.0	12.5	20.3	32.0	4.0	34.0	.....	.....	.....	.....	.....	.....	.....	243	Crushed at center bearing; broke with fine splinters	2
5.0	10.0	16.5	24.2	2.2	25.5	37.0	.....	.....	.....	.....	.....	.....	263	do	252
4.7	9.5	14.0	19.4	1.0	19.8	25.9	33.5	.....	.....	.....	.....	.....	343	do	252
5.5	11.0	17.3	27.6	3.5	29.5	.....	.....	.....	.....	.....	.....	.....	224	Crushed at center bearing; broke suddenly	316
7.0	13.4	22.3	34.3	4.0	36.0	.....	.....	.....	.....	.....	.....	.....	236	Broke suddenly with large splinters	1039
7.3	15.3	26.4	50.5	18.0	.....	.....	.....	.....	.....	.....	.....	.....	200	Broke, on reloading, with large splinters	1039
5.8	11.7	18.5	28.6	3.5	30.6	.....	.....	.....	.....	.....	.....	.....	243	Crushed at center bearing; square break	745
6.0	12.4	18.8	28.5	3.0	30.1	.....	.....	.....	.....	.....	.....	.....	234	do	745
7.0	15.4	24.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	172	do	285[1]
6.5	13.5	20.3	31.0	3.5	33.6	.....	.....	.....	.....	.....	.....	.....	224	do	285[2]
5.9	12.0	18.4	29.6	3.5	31.3	.....	.....	.....	.....	.....	.....	.....	231	do	285[3]
4.5	9.0	13.7	19.0	0.7	19.5	26.0	39.5	.....	.....	.....	.....	.....	300	do	320
5.0	10.0	15.3	21.2	1.5	22.0	29.0	41.0	.....	.....	.....	.....	.....	304	do	320
9.0	18.6	31.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	181	Specimen cross-grained; split with the grain	1113
6.1	12.0	18.0	25.0	1.2	25.7	33.0	.....	.....	.....	.....	.....	.....	268	do	476
5.7	10.7	15.9	21.2	1.0	22.0	27.6	34.0	41.2	49.0	.....	.....	.....	404	do	1133
7.5	14.0	21.6	31.0	3.0	32.3	43.0	.....	.....	.....	.....	.....	.....	268	Long fracture with one large splinter	735
7.3	14.2	22.5	31.5	2.5	33.0	43.5	70.5	.....	.....	.....	.....	.....	302	Long fracture with two large splinters	735
5.7	11.0	17.5	25.5	2.3	27.0	36.0	58.0	.....	.....	.....	.....	.....	323	do	1086
7.4	15.5	23.8	35.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	200	Specimen cross-grained; square break	1086
6.0	12.0	18.0	24.0	1.3	24.5	31.0	39.0	.....	.....	.....	.....	.....	350	Broke in three pieces	1140
6.0	10.6	15.5	21.2	1.0	21.7	28.0	.....	.....	.....	.....	.....	.....	293	Square break on tension side with large flake on compression side; broke at knot.	1140
5.5	11.0	18.0	26.5	4.0	28.0	.....	.....	.....	.....	.....	.....	.....	250	Square break with large splinters	487
4.6	10.0	15.5	21.7	2.0	23.5	.....	.....	.....	.....	.....	.....	.....	232	Square break, the ends splitting	487
11.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	Square break	462
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	do	462
4.7	9.0	13.3	18.0	0.3	18.2	22.7	28.0	33.2	38.3	46.3	53.0	.....	531	Broke with long splinters	475
5.0	9.0	13.6	18.0	0.3	18.2	23.0	27.7	32.0	38.0	44.0	51.0	61.0	583	Broke with long splinters on compression side	475
5.0	10.0	14.6	20.4	1.0	22.0	27.0	32.0	39.0	.....	.....	.....	.....	382	Broke suddenly; stick shattered	452
4.4	8.5	13.2	18.4	0.9	18.6	24.1	30.0	35.5	41.4	50.5	.....	.....	474	do	452
7.5	15.7	25.0	40.0	5.0	42.0	58.0	84.5	.....	.....	.....	.....	.....	300	Specimen cross-grained; broke with long split	280
6.9	14.7	24.0	37.7	5.3	39.0	57.1	.....	.....	.....	.....	.....	.....	286	Square break	280
8.0	16.0	26.0	39.2	5.5	41.0	.....	.....	.....	.....	.....	.....	.....	250	Specimen cross-grained; broke with long split	484
7.0	14.5	23.5	34.3	5.0	36.3	.....	.....	.....	.....	.....	.....	.....	238	Square break on tension side with large flake on compression side	484
10.5	20.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	134	Specimen cross-grained; broke through small knots	341
7.0	13.0	20.0	28.8	2.3	30.0	.....	.....	.....	.....	.....	.....	.....	245	Broke at knot	338
6.0	12.0	19.8	27.9	2.5	28.8	.....	.....	.....	.....	.....	.....	.....	204	Specimen cross-grained; oblique fracture	338

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
RHAMNACEÆ.										
42. Reynosia latifolia. *Red Iron Wood. Darling Plum.*	454	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	1.2012		976	1050	820
43. Condalia ferrea. *Black Iron Wood.*	460	do	do	do	do	1.3546		1191	1109	1127
	460	do	do	do	do	1.3430		1191	1176	680
45. Rhamnus Caroliniana. *Indian Cherry.*	803	do	Saint John's river	do	Rich hummock	0.5369		814	794	518
	1094	Arkansas	Jonesboro'	T. B. Kitchens		0.5066		718	687	616
47. Rhamnus Purshiana. *Bearberry. Bear Wood. Shittim Wood.*	993	Oregon	Portland	G. Engelmann and C. S. Sargent.	Rich, alluvial	0.5943		775	912	750
49. Colubrina reclinata. *Naked Wood.*	1139	Florida	Umbrella Key	A. H. Curtiss	Coral	0.8721		921	976	1216
SAPINDACEÆ.										
50. Æsculus glabra. *Ohio Buckeye. Fetid Buckeye.*	297	Missouri	Allenton	G. W. Letterman.	Rich, moist	0.4653		751	707	466
	297	do	do	do	do	0.4602		687	651	468
	427	Tennessee	Nashville	A. Gattinger	Rich, moist	0.4970		610	574	549
52. Æsculus Californica. *California Buckeye.*	684	California	Marin county	G. R. Vasey	Rich upland	0.5034		697	669	548
	684	do	do	do	do	0.5228		678	698	640
54. Sapindus marginatus. *Wild China. Soapberry.*	307	Texas	Dallas	J. Reverchon	Rich, damp	0.7681		888	888	663
	307	do	do	do	do	0.7784		857	948	949
	928	do	Austin	C. Mohr	Limestone	0.5243		842	814	820
	928	do	do	do	do	0.5310		688	697	703
56. Hypelate paniculata. *Ink Wood. Iron Wood.*	463	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	1.0405		1135	1206	1261
	463	do	do	do	do	1.0123		939	1017	1118
60. Acer macrophyllum. *Broad-leaved Maple.*	982	Oregon	Portland	G. Engelmann and C. S. Sargent.	Rich, alluvial	0.5445		697	734	696
	982	do	do	do	do	0.5341		751	751	696
	1023	do	Portland Furniture Company.	do		0.4907		697	842	691
	1023	do	do	do		0.5053		729	794	656
61. Acer circinatum. *Vine Maple.*	1013	do	Portland	do	Moist, alluvial	0.6928		626	713	712
	1014	Washington territory.	Wilkeson	do	do	0.7001		634	723	818
64. Acer saccharinum. *Sugar Maple. Sugar Tree. Hard Maple. Rock Maple.*	299	Missouri	Allenton	G. W. Letterman	Rich upland	0.8381		1526	1457	1219
	376	Vermont	Charlotte	C. G. Pringle	Gravelly	0.6852		888	976	816
	409	New England	Charlestown Navy-yard.	S. H. Pook		0.6775		763	930	675
	1233	Vermont	Charlotte	F. H. Horsford		0.7447		1683	1953	1404
	1233	do	do	do		0.6986		1878	1808	1289
	1234	do	do	do		0.7063		1220	1395	1235
	1234	do	do	do		0.7108		1395	1480	1284
	1235	do	do	do		0.7137		1628	1575	1242
	1235	do	do	do		0.7189		1436	1575	1104
64. Acer saccharinum, *var.* nigrum. *Black Sugar Maple.*	213	do	do	C. G. Pringle	Clay	0.7241		1039	1149	1055
	2741	Missouri	Allenton	G. W. Letterman	Low, alluvial	0.7355		1085	1221	1055
	440	Tennessee	Nashville	A. Gattinger	Rich	0.6973		888	1149	1024
	757	Florida	Chattahoochee	A. H. Curtiss	Clay	0.6979		857	930	938
	757	do	do	do	do	0.6824		610	688	743
65. Acer dasycarpum. *Soft Maple. White Maple. Silver Maple.*	1052	Massachusetts	Topsfield	J. Robinson	Low meadow	0.6641		976	1109	1019
66. Acer rubrum. *Red Maple. Swamp Maple. Soft Maple. Water Maple.*	20	do	Arnold Arboretum	C. S. Sargent	Drift	0.7148		827	864	738
	530	Mississippi	Kemper's mill	C. Mohr	Rich, swampy	0.6136		871	1039	820

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

Deflection, in millimeters, under a pressure, in kilograms, of—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
5.0	9.3	13.5	18.0	0.5	19.0	23.0	30.0	.....	.....	.....	.....	.....	350	Specimen cross-grained	454
4.1	8.8	11.5	15.5	0.5	16.0	20.0	24.5	30.0	33.7	40.0	.....	.....	481	Long, shattered break	460
4.1	8.3	12.1	16.0	0.5	17.0	21.2	.....	.....	.....	.....	.....	.....	290	Specimen cross-grained	460
6.0	12.3	18.0	26.5	2.4	27.5	.....	.....	.....	.....	.....	.....	.....	221	Long break, starting at small knot	803
6.8	14.2	22.1	33.0	2.5	34.0	.....	.....	.....	.....	.....	.....	.....	263	Shattered	1094
6.3	10.7	16.5	22.0	1.0	23.0	28.0	36.6	.....	.....	.....	.....	.....	320	Long, shattered break with large splinters	993
5.3	10.0	15.0	19.6	0.5	19.5	24.5	29.0	34.5	48.0	57.0	.....	.....	519	Specimen cross-grained; shattered	1139
6.5	13.8	22.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	199	Crushed at center bearing	297
7.1	15.0	24.0	41.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	200	do	297
8.0	17.0	27.6	44.0	7.5	48.6	.....	.....	.....	.....	.....	.....	.....	234	Crushed at center bearing; broke at knot on tension side	427
7.0	14.6	23.0	31.5	1.8	32.0	44.0	.....	.....	.....	.....	.....	.....	265	Long fracture; large splinters	684
7.2	14.0	21.7	30.3	2.3	31.8	44.2	.....	.....	.....	.....	.....	.....	277	Long fracture	684
5.5	11.0	16.6	23.5	1.5	24.5	32.0	42.0	59.0	.....	.....	.....	.....	383	Long, splintered fracture	307
5.7	10.3	15.5	22.4	1.5	23.4	30.7	42.0	58.0	90.0	.....	.....	.....	405	Splintered fracture	307
5.8	12.0	19.0	29.0	3.0	29.7	37.0	53.0	.....	.....	.....	.....	.....	350	do	928
7.1	14.0	22.0	32.0	4.2	34.2	45.0	.....	.....	.....	.....	.....	.....	300	Long, splintered fracture	928
4.3	8.1	12.0	16.5	0.7	17.0	21.5	27.0	33.2	39.5	48.5	62.0	.....	538	Shattered	463
5.2	9.6	14.5	19.0	1.0	19.0	24.0	30.5	36.5	44.5	56.0	.....	.....	477	do	463
7.0	13.3	21.0	30.5	3.4	32.0	43.0	.....	.....	.....	.....	.....	.....	297	Short break, splitting in axis of stick	982
6.5	13.0	19.8	29.5	3.0	31.0	42.0	.....	.....	.....	.....	.....	.....	297	Slightly crushed at center bearing	982
7.0	11.6	17.8	25.0	2.0	26.0	35.0	.....	.....	.....	.....	.....	.....	295	Slightly crushed at center bearing; splintered	1023
6.7	12.3	19.4	29.0	2.5	30.0	41.0	.....	.....	.....	.....	.....	.....	280	Short break with long, large splinter	1023
7.8	13.7	21.5	30.5	2.0	31.4	40.3	.....	.....	.....	.....	.....	.....	304	Long, shattered break	1013
7.7	13.5	21.0	29.5	2.0	30.0	39.0	50.5	.....	.....	.....	.....	.....	349	do	1014
3.2	6.7	10.2	13.5	0.3	13.8	17.0	21.5	25.8	32.0	39.0	50.5	.....	551	Long splinter on angle of two faces	299
5.5	10.0	15.0	20.0	0.7	20.3	26.0	35.0	.....	.....	.....	.....	.....	348	Splintered	376
6.4	10.5	15.5	20.5	0.8	21.3	27.0	.....	.....	.....	.....	.....	.....	288	Specimen cross-grained; split with grain	409
2.9	5.0	7.7	10.2	0.0	10.2	12.6	15.2	18.2	21.7	25.4	31.4	38.3	599	Broke with fine splinters on back	1233
2.6	5.4	8.4	11.2	0.0	11.2	14.0	17.0	20.2	25.3	30.0	39.0	50.0	550	do	1233
4.0	7.0	10.2	13.6	0.2	13.6	16.6	20.2	24.6	30.0	36.0	47.0	.....	527	Square break on tension side, splitting in axis	1234
3.5	6.6	10.0	13.0	0.2	13.0	16.0	19.5	23.4	27.7	33.0	42.0	.....	548	do	1234
3.0	6.2	9.6	13.0	0.0	13.0	15.8	19.7	24.7	30.0	36.8	50.0	.....	530	do	1235
3.4	6.2	9.1	12.2	0.0	12.5	15.4	19.0	22.6	27.6	34.5	.....	.....	471	Specimen cross-grained; shattered on angle of two faces	1235
4.7	8.5	13.5	18.2	0.5	18.0	23.5	30.6	38.0	49.5	65.0	.....	.....	450	Broke with long splinters	213
4.5	8.0	12.0	15.5	0.5	16.3	20.0	26.0	32.0	43.5	.....	.....	.....	450	Crushed slightly at center bearing; broke with fine splinters	274
5.5	8.5	13.0	17.6	0.6	18.0	22.5	29.5	37.0	52.0	.....	.....	.....	437	Broke with fine splinters	440
5.7	10.5	16.5	23.0	1.5	24.0	30.7	41.5	53.0	.....	.....	.....	.....	398	Splintered on angle, starting at small knot	757
8.0	14.2	21.0	30.0	2.0	30.7	40.4	54.0	.....	.....	.....	.....	.....	317	Broke with long, fine splinters	757
5.0	8.8	14.0	19.0	1.3	19.2	25.0	32.0	41.0	55.0	.....	.....	.....	435	Broke with long, fine splinters	1052
5.9	11.3	17.2	24.5	1.6	26.0	35.0	46.5	.....	.....	.....	.....	.....	315	Specimen sap-wood, cross-grained; broke at knot	20
5.6	9.4	14.2	19.5	1.2	20.0	28.0	39.5	58.0	.....	.....	.....	.....	350	Crushed at center bearing; broke with fine splinters	530

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
66. Acer rubrum—continued	530	Mississippi	Kemper's mill	C. Mohr	Rich, swampy	0.5999		976	1028	809
	743	Georgia	Bainbridge	A. H. Curtiss	Low	0.5524		888	930	600
	743	do	do	do	do	0.5509		976	1085	797
	878	Massachusetts	Danvers	J. Robinson	do	0.6818		888	888	937
	878	do	do	do	do	0.7102		775	835	839
	1048	do	North Reading	do	do	0.6699		888	904	820
	1048	do	do	do	do	0.6710		842	913	937
67. Negundo aceroides *Box Elder. Ash-leaved Maple.*	290	Missouri	Allenton	G. W. Letterman	Rich bottom	0.4750		610	618	443
	290	do	do	do	do	0.4585		626	697	572
	311	Texas	Dallas	J. Reverchon	do	0.4773		452	478	509
	311	do	do	do	do	0.4614		514	536	591
68. Negundo Californicum *Box Elder.*	645	California	Contra Costa county	G. R. Vasey	Rich, moist	0.5227		939	986	785
	645	do	do	do	do	0.5227		921	904	809
ANACARDIACEÆ.										
71. Rhus copallina *Dwarf Sumach.*	736	Florida	Chattahoochee	A. H. Curtiss	Dry clay	0.4888		634	638	694
	736	do	do	do	do	0.5054		763	835	633
73. Rhus Metopium *Poison Wood. Coral Sumach. Mountain Manchineel. Bum Wood. Hog Plum. Doctor Gum.*	467	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.7967		921	1050	616
	467	do	do	do	do	0.8105		921	1050	694
LEGUMINOSÆ.										
77. Robinia Pseudacacia *Locust. Black Locust. Yellow Locust.*	405		Charlestown Navy-yard.	S. H. Pook				1395	1302	1481
	405		do	do		0.8205		857	1302	1362
	405		do	do		0.8148		1221	1268	1514
	815	West Virginia	Grafton	C. G. Pringle		0.6433		1039	1050	1041
	815	do	do	do		0.6433		814	976	851
	1247	New York	Long Island	M. C. Beedle		0.7956		1526	1627	1387
	1247	do	do	do		0.7769		1627	1627	1355
	1248	do	do	do		0.8069		976	1123	1069
	1248	do	do	do		0.8456		1320	1436	1397
79. Robinia Neo-Mexicana *Locust.*	1031	Colorado	Trinidad	W. B. Strong	Low, moist	0.8019		1061	1149	909
80. Olneya Tesota *Iron Wood. Arbol de Hierro.*	650	California	Lower Colorado valley.	G. Engelmann and C. S. Sargent.	Dry, gravelly	0.9841		976	1039	942
	650	do	do	do	do	1.1966		659	697	558
81. Piscidia Erythrina *Jamaica Dogwood.*	564	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	1.0398		740	814	820
	564	do	do	do	do	0.9466		842	888	675
82. Cladrastis tinctoria *Yellow Wood. Yellow Ash. Gopher Wood.*	33	Kentucky	Mercer county	W. M. Linney	Limestone	0.7852		888	976	989
	33	do	do	do	do	0.6444		957	1028	813
84. Sophora affinis	329	Texas	Dallas	J. Reverchon	Dry, calcareous	0.8697		842	857	820
	932	do	Austin	C. Mohr	do	0.9594		1150	1097	799
85. Gymnocladus Canadensis *Kentucky Coffee Tree. Coffee Nut.*	519	Tennessee	Nashville	A. Gattinger	Limestone	0.7146		872	840	703
	1241	Missouri	Allenton	G. W. Letterman	Alluvial	0.6966		1061	1110	813
	1242	do	do	do	do	0.6875		1221	1149	769
	1243	do	do	do	do	0.6670		976	1085	802
86. Gleditschia triacanthos *Honey Locust. Black Locust. Three-thorned Acacia. Sweet Locust. Honey Shucks.*	53[1]	do	do	do	Low, rich	0.6250		976	1149	968
	53[2]	do	do	do	do	0.6381		1164	1221	907
	444	Tennessee	Nashville	A. Gattinger	Dry, sandy barrens	0.6969		888	888	803

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
5.0	9.5	14.5	19.0	0.5	19.2	25.0	35.5	.....	.....	.....	.....	.....	345	Broke with long splinters	530
5.5	10.5	16.5	23.5	2.0	24.5	32.0	.....	.....	.....	.....	.....	.....	256	Specimen 0.75 sap-wood; cross-grained	743
5.0	9.0	14.5	20.0	0.7	20.5	27.0	39.0	.....	.....	.....	.....	.....	340	Sap-wood; crushed at center bearing; broke with fine splinters	743
5.5	11.0	17.0	24.0	1.2	25.0	33.0	42.0	61.0	.....	.....	.....	.....	400	do	878
6.3	11.7	18.3	28.0	3.0	28.4	37.5	52.5	90.0	.....	.....	.....	.....	358	Sap-wood; broke with long, large splinters	878
5.5	10.8	16.0	22.0	1.1	23.0	31.5	42.0	.....	.....	.....	.....	.....	350	do	1048
5.8	10.7	15.5	21.5	1.0	21.8	28.0	37.0	50.0	.....	.....	.....	.....	400	do	1048
8.0	15.8	26.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	189	Broke at knot near center bearing	290
7.8	14.0	22.0	33.5	3.8	35.0	.....	.....	.....	.....	.....	.....	.....	244	Crushed at center bearing; square break	290
10.8	20.6	31.0	44.5	5.0	47.0	.....	.....	.....	.....	.....	.....	.....	217	Square break at knot	311
9.5	18.2	30.0	42.0	3.5	44.0	71.0	.....	.....	.....	.....	.....	.....	252	Flaked on tension side; broke at small knot	311
5.2	9.9	14.2	21.2	1.0	21.2	28.0	37.5	.....	.....	.....	.....	.....	335	Crushed at center bearing; broke into long splinters	645
5.3	10.8	15.8	21.0	0.5	22.0	28.0	36.5	.....	.....	.....	.....	.....	345	Crushed at center bearing; broke into long, fine splinters	645
7.7	15.3	23.2	32.3	2.0	33.5	43.5	.....	.....	.....	.....	.....	.....	296	Shattered, splitting to the end	736
6.4	11.7	18.0	27.0	3.1	28.0	37.3	.....	.....	.....	.....	.....	.....	270	do	736
5.3	9.3	14.5	21.3	1.6	23.0	30.5	.....	.....	.....	.....	.....	.....	263	Square break	467
5.3	9.3	14.5	21.3	1.5	23.0	30.5	.....	.....	.....	.....	.....	.....	296	do	467
3.5	8.0	11.0	14.5	0.8	14.7	18.0	22.0	25.8	30.2	35.6	41.5	47.8	632	60.2 millimeters deflection with 600 kilograms; specimen cross-grained.	405
5.7	7.5	12.0	15.5	0.3	15.8	19.0	23.5	28.7	35.0	40.0	47.0	55.0	581	Broke with fine splinters	405
4.0	7.7	11.5	15.6	0.2	15.3	19.0	23.9	28.0	32.0	37.0	44.5	51.8	646	64.3 millimeters deflection with 600 kilograms; broke with fine splinters.	405
4.7	9.3	13.8	19.1	0.3	19.0	23.7	30.0	38.0	47.7	.....	.....	.....	444	Broke with coarse splinters	815
6.0	10.0	14.5	19.0	0.5	19.5	24.0	30.0	42.0	.....	.....	.....	.....	363	do	815
3.2	6.0	9.0	12.0	0.0	12.0	15.0	18.0	21.0	24.9	29.3	34.7	42.5	592	Splintered on corners	1247
3.0	6.0	9.0	11.6	0.2	11.8	14.5	17.8	21.2	25.4	31.2	38.0	46.5	578	Broke with fine splinters	1247
5.0	8.7	12.5	16.6	0.4	16.8	20.8	25.5	31.0	36.5	45.6	.....	.....	456	Broke with large splinters on corners	1248
3.7	6.8	10.0	13.2	0.5	13.5	16.4	20.1	24.3	28.0	33.5	39.0	46.4	596	do	1248
4.6	8.5	12.4	16.2	0.4	16.7	20.6	25.0	31.0	.....	.....	.....	.....	388	Broke with long splinters	1031
5.0	9.4	14.2	19.5	0.5	20.0	26.5	33.7	42.0	54.3	.....	.....	.....	402	Cross-grained; split with grain	650
7.4	14.0	21.0	29.9	1.4	31.0	.....	.....	.....	.....	.....	.....	.....	238	Square break	650
6.6	12.0	19.5	26.0	1.8	27.1	33.5	43.0	51.0	.....	.....	.....	.....	354	Broke with long, large splinters	564
5.8	11.0	17.3	24.0	1.4	24.5	30.5	.....	.....	.....	.....	.....	.....	288	do	564
5.5	10.0	15.8	21.6	1.1	22.5	29.0	37.0	47.0	68.0	.....	.....	.....	422	Long, large splinters on angle of two faces	33
5.1	9.5	14.5	20.2	1.0	20.5	28.0	.....	.....	.....	.....	.....	.....	347	Started at small knot; long, oblique fracture	33
5.8	11.4	17.0	23.0	1.5	25.0	33.0	42.0	.....	.....	.....	.....	.....	350	Broke at large knot with long splinters	320
4.4	8.9	13.0	18.2	1.2	18.7	24.0	31.0	.....	.....	.....	.....	.....	341	Long, oblique break	932
5.6	11.5	18.5	29.9	3.0	29.0	37.3	52.0	.....	.....	.....	.....	.....	300	Square break on tension side, splitting in axis of the stick	519
4.6	8.8	13.0	18.4	0.9	18.8	26.0	37.5	.....	.....	.....	.....	.....	347	Splintered on angle of two faces	1241
4.0	8.5	14.0	19.2	1.5	20.0	28.7	46.5	.....	.....	.....	.....	.....	328	Broke with fine splinter	1242
5.0	9.0	13.7	20.0	1.4	20.5	28.3	44.0	.....	.....	.....	.....	.....	342	do	1243
5.0	8.5	12.6	16.8	0.6	18.0	24.0	31.0	41.0	57.0	.....	.....	.....	413	Crushed at center bearing; broke with fine splinter	53[1]
4.2	8.0	12.9	17.6	1.0	18.7	25.0	33.0	47.0	.....	.....	.....	.....	387	Broke with fine splinter	53[2]
5.5	[illegible].0	16.4	22.5	1.0	23.5	31.7	39.5	55.5	.....	.....	.....	.....	381	Broke with long splinter	444

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
87. Gleditschia monosperma *Water Locust.*	760	Florida	Chattahoochee	A. H. Curtiss	Alluvial	0.7628		1061	1149	1073
	760	do	do	do	do	0.7748		1221	1191	982
88. Parkinsonia Torreyana *Green-bark Acacia. Palo Verde.*	678	Arizona	Lower Colorado river.	G. Engelmann and C. S. Sargent.	Sandy	0.6705		514	514	511
	678	do	do	do	do	0.6727		568	602	579
91. Cercis Canadensis *Redbud. Judas Tree.*	436	Tennessee	Nashville	A. Gattinger	Limestone	0.7323		814	904	1003
	1089	Missouri	Allenton	G. W. Letterman	Rich	0.6341		588	610	734
	1090	do	do	do	do	0.6534		452	514	640
	1091	do	do	do	do	0.6250		651	723	516
93. Prosopis juliflora *Mesquit. Algaroba. Honey Locust. Honey Pod.*	680	Arizona	Tucson	C. S. Sargent		0.7818		542	618	469
	680	do	do	do		0.7614		596	630	574
	927	Texas	Austin	C. Mohr	Rich, calcareous	0.7750		509	501	412
94. Prosopis pubescens *Screw Bean. Screw-pod Mesquit. Tornilla.*	658	California	Fort Yuma	G. Engelmann and C. S. Sargent.	Sandy	0.8068		814	835	902
	658	do	do	do		0.8568		787	814	886
98. Acacia Greggii *Cat's Claw.*	697	Arizona	Santa Rita mountains.	do	Dry, gravelly	0.8714		1039	1085	792
100. Lysiloma latisiliqua *Wild Tamarind.*	509	Florida	Boca Chica Key	A. H. Curtiss	Coral	0.5670		488	461	553
ROSACEÆ.										
102. Chrysobalanus Icaco *Cocoa Plum.*	480	do	Bay Biscayne	do	Swampy	0.7753		957	1110	961
103. Prunus Americana *Wild Plum. Canada Plum. Horse Plum.*	68	Missouri	Allenton	G. W. Letterman	Rich upland	0.6003		814	769	649
	68	do	do	do	do	0.5916		651	734	703
	334	Texas	Dallas	J. Reverchon	Rich	0.8045		921	976	1240
104. Prunus angustifolia *Chickasaw Plum. Hog Plum.*	435	Tennessee	Nashville	A. Gattinger	River bluff	0.6538		634	603	469
107. Prunus emarginata, *var.* mollis	968	Washington territory.	Wilkeson	G. Engelmann and C. S. Sargent.	Low, rich	0.4699		751	849	687
	968	do	do	do	do	0.4750		751	872	670
108. Prunus serotina *Wild Black Cherry. Rum Cherry.*	15	Massachusetts	Roxbury	C. S. Sargent	Gravelly	0.7438		775	849	1171
	15	do	do	do	do	0.7386		1017	888	1084
	115[1]	Michigan	Lansing	W. J. Beal	do	0.5315		651	673	579
	115[2]	do	Dansville	do	do	0.5048		814	849	724
	127	Missouri	Allenton	G. W. Letterman	Rich loam	0.6790		976	976	905
	127	do	do	do	do	0.6670		1221	1028	996
	148	Illinois	Waukegan	R. Douglas	Gravelly	0.6471		976	930	937
	317	Michigan	Hersey	W. J. Beal	Rich	0.5315		775	800	689
	317	do	do	do	do	0.5493		842	828	691
	368	Vermont	Charlotte	C. G. Pringle	Gravelly	0.5648		764	857	769
	406	Virginia or Middle States.	Charlestown Navy-yard.	S. H. Pook		0.5028		651	718	642
	763	Florida	Chattahoochee	A. H. Curtiss	Clay	0.6105		976	958	797
	763	do	do	do	do	0.6244		888	976	792
	1053	Massachusetts	Topsfield	J. Robinson	Gravelly	0.6751		740	769	820
	1053	do	do	do	do	0.6716		698	775	820
110. Prunus demissa *Wild Cherry.*	637	California	Strawberry valley	G. Engelmann and C. S. Sargent.	Low, rich	0.7636		814	769	691
111. Prunus Caroliniana *Wild Orange. Mock Orange. Wild Peach.*	1032	Florida	Jacksonville	A. H. Curtiss	Sandy	0.8785		697	718	586
	1062	Texas	Victoria	C. Mohr	Rich, moist	0.8698		1191	1097	1269
	1062	do	do	do	do	0.8481		976	996	930

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
4.6	8.5	13.3	43.2	0.6	18.0	23.5	29.0	.....	42.0	.....	.....	.....	458	0.66 sap-wood; broke with long, fine splinters	760
4.0	8.2	12.8	18.5	1.0	19.5	25.5	33.0	40.5	52.5	.....	.....	.....	419	Specimen cross-grained; split with grain	760
9.5	19.0	28.4	43.2	0.4	46.0	.....	.....	.....	.....	.....	.....	.....	218	Specimen cross-grained; broke at knot	678
8.6	16.2	25.4	35.2	3.0	37.7	.....	.....	.....	.....	.....	.....	.....	247	Long, oblique fracture	678
6.0	10.8	15.8	22.9	1.6	22.7	29.7	38.0	50.0	68.0	.....	.....	.....	428	Broke with long, large splinters	436
8.3	16.0	24.5	35.0	2.5	37.0	48.0	74.5	.....	.....	.....	.....	.....	313	.....do	1089
10.8	19.0	29.7	43.0	6.0	45.5	61.0	.....	.....	.....	.....	.....	.....	277	.....do	1090
7.5	13.5	20.0	28.4	1.5	30.0	.....	.....	.....	.....	.....	.....	.....	220	Broke at knot near support	1091
9.0	15.8	23.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200	Specimen cross-grained; short, oblique fracture	680
8.2	15.5	22.5	30.7	1.6	31.7	.....	.....	.....	.....	.....	.....	.....	245	.....do	680
9.6	19.5	31.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	176	Specimen cross-grained; shattered	927
6.0	11.7	17.7	24.3	1.3	25.0	32.0	41.0	.....	.....	.....	.....	.....	385	Specimen cross-grained; short, oblique fracture	658
6.2	12.0	17.3	24.5	2.2	25.5	33.5	42.0	53.0	.....	.....	.....	.....	378	.....do	658
4.7	9.0	14.0	18.1	0.6	18.6	24.0	29.0	.....	.....	.....	.....	.....	338	Broke at knot near the end	697
10.0	21.2	32.7	51.3	8.0	55.3	.....	.....	.....	.....	.....	.....	.....	236	Specimen cross-grained	509
5.1	8.8	13.0	17.8	0.9	18.0	23.0	31.5	40.0	66.0	.....	.....	.....	410	Broke with long splinters, starting at knot	480
6.0	12.7	19.3	27.4	1.7	28.0	37.0	.....	.....	.....	.....	.....	.....	277	Broke with long splinters	68
7.5	13.3	21.0	28.0	1.6	29.0	36.5	.....	.....	.....	.....	.....	.....	300	Broke with long, large splinters	68
5.3	10.0	14.9	20.7	0.5	20.6	27.0	34.0	41.0	50.0	61.5	84.0	.....	529	Broke with fine splinters	334
7.7	16.2	26.0	38.5	4.5	.....	.....	.....	.....	.....	.....	.....	.....	200	Specimen cross-grained, defective; square break on tension side	435
6.5	11.5	17.7	25.2	1.5	26.0	36.0	.....	.....	.....	.....	.....	.....	293	Broke with long, coarse splinters	968
6.5	11.2	17.0	24.7	1.7	26.0	36.5	.....	.....	.....	.....	.....	.....	286	Shattered	968
6.3	11.5	17.3	23.6	1.0	24.2	30.0	38.5	46.5	57.5	73.0	.....	.....	500	.....do	15
4.8	11.0	15.9	22.0	0.6	22.0	28.0	35.7	44.0	55.0	.....	.....	.....	467	Broke with fine splinters	15
7.5	14.5	21.7	32.0	1.6	32.5	.....	.....	.....	.....	.....	.....	.....	247	Long, oblique fracture	115
6.0	11.5	17.6	24.6	1.0	25.0	32.5	45.0	.....	.....	.....	.....	.....	309	.....do	115
5.0	10.0	15.2	21.5	1.3	22.0	28.5	36.5	47.0	.....	.....	.....	.....	386	Broke with long splinters	127
4.0	9.5	15.0	21.0	1.2	22.0	28.0	36.0	45.0	57.5	.....	.....	.....	425	Shattered; long splinters	127
5.0	10.5	16.0	21.5	1.0	22.5	28.0	36.5	45.5	.....	.....	.....	.....	400	Broke with fine splinters	148
6.3	12.2	19.0	26.8	1.1	27.5	36.0	.....	.....	.....	.....	.....	.....	294	Shattered; long splinters on corner	317
5.8	11.8	16.7	23.0	0.6	24.0	30.0	.....	.....	.....	.....	.....	.....	295	Broke with long splinters on corner	317
6.4	11.4	16.7	22.6	1.0	23.0	30.0	40.5	.....	.....	.....	.....	.....	328	Broke with coarse splinters	368
7.5	13.6	21.5	30.7	1.7	31.6	43.5	.....	.....	.....	.....	.....	.....	274	Specimen cross-grained; single fracture	406
5.0	10.2	15.2	21.0	0.6	21.8	26.5	34.0	.....	.....	.....	.....	.....	340	Broke with fine splinters	763
5.5	10.0	15.5	20.8	1.0	21.5	27.0	35.0	.....	.....	.....	.....	.....	338	Broke with long, large splinters	763
6.6	12.7	19.5	27.0	1.5	28.0	36.0	46.0	62.5	.....	.....	.....	.....	350	Specimen cross-grained; long fracture	1053
7.0	12.6	19.5	26.5	1.5	27.0	34.0	46.0	59.5	.....	.....	.....	.....	350	.....do	1053
6.0	12.7	19.5	28.4	1.6	28.3	36.5	.....	.....	.....	.....	.....	.....	295	Specimen gross-grained; split with the grain	637
7.0	13.6	22.0	32.3	4.0	34.0	73.0	.....	.....	.....	.....	.....	.....	250	Specimen cross-grained	1032
4.1	8.9	13.5	18.4	0.2	19.0	23.5	29.2	35.7	41.7	53.0	74.0	.....	540	.....do	1062
5.0	9.8	14.0	18.5	0.6	19.0	24.5	32.0	37.5	.....	.....	.....	.....	397	Specimen cross-grained; shattered	1062

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
113. Prunus ilicifolia *Islay.*	1158	California	Santa Cruz	C. L. Anderson		0.9734		751	751	820
	1158	do	do	do		0.9678		697	712	745
117. Pyrus coronaria *American Crab. Sweet-scented Crab.*	1087	Pennsylvania	Nazareth	J. Henry	Moist	0.7357		751	751	441
	1087	do	do	do	do	0.7228		729	723	422
	1088	do	do	do	do	0.7340		508	465	452
	1088	do	do	do	do	0.7382		651	630	623
121. Pyrus sambucifolia *Mountain Ash.*	410	Vermont	Mount Mansfield	C. G. Pringle	Gravelly	0.5727		575	626	445
125. Cratægus arborescens	607	Georgia	Ogeechee	A. H. Curtiss	Low	0.6818		814	814	799
	607	do	do	do	do	0.7126		788	763	443
126. Cratægus Crus-galli *Cockspur Thorn. Newcastle Thorn.*	328	Massachusetts	Brookline	J. Robinson	Loam	0.6946		543	575	619
	328	do	do	do	do	0.7166		508	514	586
	1093	Missouri	Allenton	G. W. Letterman	Low, wet	0.7767		751	775	703
	1093	do	do	do	do	0.7946		751	794	708
128. Cratægus subvillosa *Scarlet Haw.*	949	Texas	Victoria	C. Mohr	Alluvial	0.7565		921	913	860
	1081	Missouri	Saint Louis	H. Eggert		0.8670		842	888	616
130. Cratægus tomentosa *Black Thorn. Pear Haw.*	426	Tennessee	Nashville	A. Gattinger	Limestone	0.7166		740	740	698
	426	do	do	do	do	0.7527		651	723	720
132 Cratægus spathulata *Small-fruited Haw.*	926	Louisiana	Webster parish	C. Mohr	Clay	0.7102		718	674	506
134. Cratægus æstivalis *May Haw. Apple Haw.*	239	South Carolina	Bonneau's Depot	H. W. Ravenel	Damp, rich	0.7239		595	592	712
135. Cratægus flava, *var.* pubescens *Summer Haw. Red Haw.*	707	Florida	Aspalaga	A. H. Curtiss	Dry clay	0.7973		740	708	724
137. Amelanchier Canadensis *Juneberry. Shad Bush. Service Tree. May Cherry.*	241	Kentucky	Brumfield Station	W. M. Linney	Waverly shale	0.8312		1191	1221	1256
	849	Massachusetts	Danvers	J. Robinson	Loam	0.8472		1085	1149	1085
	849	do	do	do	do	0.8410		1163	1221	1054
HAMAMELACEÆ.										
39. Liquidambar Styraciflua *Sweet Gum. Star-leaved Gum. Liquidamber. Red Gum. Bilsted.*	546	Alabama	Kemper's mill	C. Mohr	Rich, alluvial	0.5448		603	610	520
	546	do	do	do	do	0.5796		688	674	663
	1095	Arkansas	Little Rock	G. W. Letterman		0.6012		888	930	776
	1095	do	do	do		0.5765		976	996	703
	1173	New Jersey	Mount Holly	S. P. Sharples	Clay	0.6080		751	769	750
	1173	do	do	do	do	0.6477		697	496	738
	1181	Mississippi	Yazoo River bottom	R. Abbey	Alluvial	0.5864		751	781	553
	1181	do	do	do	do	0.6001		787	849	544
	1182	do	do	do	do	0.6250		976	1017	670
	1182	do	do	do	do	0.6375		1163	1061	614
	1183	do	do	do	do	0.5409		814	888	661
	1183	do	do	do	do	0.6159		1017	976	616
RHIZOPHORACEÆ.										
140. Rhizophora Mangle *Mangrove.*	485	Florida	Bay Biscayne	A. H. Curtiss	Salt-marsh	1.1480		1627	1627	1308
	485	do	do	do	do	1.1335		1627	1684	1106
COMBRETACEÆ.										
141. Conocarpus erecta *Button Wood.*	489	do	do	do	do	1.0240		814	913	830
	489	do	do	do	do	1.0292		1062	1136	1055
142. Laguncularia racemosa *White Button Wood. White Mangrove.*	507	do	Sugar-Leaf Sound	do	do	0.7384		698	634	272
	507	do	do	do	do	0.7239		775	814	764

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
6.5	13.0	20.0	29.0	3.0	30.0	38.0	56.0	90.0	.....	.....	.....	.....	350	Broke with large splinters	1158
7.0	13.7	22.3	32.5	4.5	35.0	48.0	67.0	.....	.....	.....	.....	.....	318	Broke with long splinters	1158
6.5	13.0	21.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	188	Broke at knot	1087
6.7	13.5	21.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180	Specimen cross-grained	1087
9.6	21.0	33.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	193	Specimen cross-grained; defective	1088
7.5	15.5	24.6	36.5	4.8	37.0	51.5	.....	.....	.....	.....	.....	.....	266	Specimen cross-grained	1088
8.5	15.6	25.5	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	190	Broke at knots	410
6.0	12.0	18.3	26.5	1.5	27.1	35.0	47.0	.....	.....	.....	.....	.....	341	Specimen cross-grained; broke with one long splinter	607
6.2	12.8	20.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	189	Broke at knot	607
9.0	17.0	28.0	39.0	4.9	41.0	58.0	.....	.....	.....	.....	.....	.....	264	Broke with long splinters	328
9.6	19.0	28.5	42.3	5.0	44.0	.....	.....	.....	.....	.....	.....	.....	250	Specimen cross-grained; split with grain	328
6.5	12.6	20.0	29.0	2.1	29.0	38.0	.....	.....	.....	.....	.....	.....	300	Square break	1092
6.5	12.3	18.1	26.0	2.0	26.5	34.2	46.5	.....	.....	.....	.....	.....	302	Broke at knots	1092
5.3	10.7	16.0	22.0	1.0	23.0	29.0	37.0	49.5	.....	.....	.....	.....	367	Specimen cross-grained; split with grain	949
5.8	11.0	16.6	25.5	2.1	26.0	34.0	.....	.....	.....	.....	.....	.....	263	Broke at knot	1081
6.6	13.2	20.2	29.0	2.2	30.5	39.2	.....	.....	.....	.....	.....	.....	298	Broke with a long splinter, starting at knot	426
7.5	13.5	21.0	30.3	3.0	32.0	41.0	59.0	.....	.....	.....	.....	.....	307	Broke at knot	426
6.8	14.5	22.5	33.0	2.5	34.0	.....	.....	.....	.....	.....	.....	.....	216	.....do	926
8.2	16.5	28.0	39.0	5.0	41.7	57.0	83.0	.....	.....	.....	.....	.....	304	.....do	239
6.6	13.8	23.5	34.0	4.3	35.0	44.5	70.0	.....	.....	.....	.....	.....	309	Broke at knot with a large splinter	767
4.1	8.0	11.5	14.6	0.0	14.0	18.5	22.3	28.0	32.5	40.5	51.5	.....	536	Broke with fine splinters	241
4.5	8.5	12.6	17.0	0.8	17.4	22.0	29.0	36.0	47.5	.....	.....	.....	463	.....do	849
4.2	8.0	12.4	17.0	0.7	17.7	23.0	30.0	37.0	57.0	.....	.....	.....	450	.....do	849
8.1	16.0	24.5	36.2	3.4	37.9	.....	.....	.....	.....	.....	.....	.....	222	Sap-wood; split lengthwise without breaking	546
7.1	14.5	23.5	34.5	4.5	36.2	52.5	.....	.....	.....	.....	.....	.....	283	Sap-wood; crushed and splintered	546
5.5	10.5	16.0	22.5	1.0	23.2	30.2	45.0	.....	.....	.....	.....	.....	331	Long, shattered break	1095
5.0	9.8	14.5	20.6	0.9	21.0	28.5	.....	.....	.....	.....	.....	.....	300	.....do	1095
6.5	12.7	20.5	31.0	3.5	32.0	45.0	79.0	.....	.....	.....	.....	.....	320	Sap-wood; broke with fine splinters	1173
7.0	12.0	19.7	29.0	2.7	30.4	42.0	67.0	.....	.....	.....	.....	.....	315	.....do	1173
6.5	12.5	19.0	32.2	3.6	35.0	.....	.....	.....	.....	.....	.....	.....	236	Broke with long splinters	1181
6.2	11.5	17.6	28.7	4.0	31.0	.....	.....	.....	.....	.....	.....	.....	232	.....do	1181
5.0	9.6	14.6	20.4	1.0	21.2	29.2	.....	.....	.....	.....	.....	.....	286	Crushed at center bearing; broke with one long splinter	1182
4.2	9.2	14.7	22.0	1.2	23.0	36.0	.....	.....	.....	.....	.....	.....	262	Broke with long, coarse splinters	1182
6.0	11.0	17.6	25.0	1.4	25.6	35.0	.....	.....	.....	.....	.....	.....	282	Crushed at center bearing; shattered	1183
4.8	10.0	15.5	23.7	2.4	26.0	40.0	.....	.....	.....	.....	.....	.....	263	.....do	1183
3.0	6.0	8.4	11.0	0.2	11.0	13.5	17.0	20.0	24.0	28.0	32.2	38.3	558	Broke with coarse splinters	485
3.0	5.8	8.5	11.5	0.2	11.5	14.5	18.0	21.6	25.7	29.6	.....	.....	472	.....do	485
6.0	10.7	16.0	21.6	0.9	22.5	28.3	35.5	47.5	.....	.....	.....	.....	354	Specimen cross-grained; split with grain	489
4.6	8.6	12.7	17.5	0.6	17.5	22.0	28.5	35.0	45.0	.....	.....	.....	450	Splintered	489
7.0	15.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	116	Broke at knot	507
6.3	12.0	19.5	25.7	1.2	26.5	36.0	51.0	.....	.....	.....	.....	.....	326	Shattered	507

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
MYRTACEÆ.										
144. Eugenia buxifolia *Gurgeon Stopper. Spanish Stopper.*	1118	Florida	Lost Man's river	A. H. Curtiss	Humus and coral	1.0635		1627	1575	1055
146. Eugenia monticola *Stopper. White Stopper.*	1135	do	Umbrella Key	do	Coral	0.9405		1017	1085	1172
148. Eugenia procera *Red Stopper.*	1127	do	Miami	do	do	0.9966		1191	1206	1179
	1127	do	do	do	do	1.0023		1163	1177	1172
CORNACEÆ.										
151. Cornus florida *Flowering Dogwood. Box Wood.*	67	Missouri	Allenton	G. W. Letterman	Upland	0.8937		787	814	872
	67	do	do	do	do	0.8904		787	849	1012
	761	Florida	Chattahoochee	A. H. Curtiss	Calcareous	0.7795		787	794	820
	812	West Virginia	Grafton	C. G. Pringle	Dry	0.7980		787	849	951
	812	do	do	do	do	0.7947		763	814	886
	1077	Missouri	Allenton	G. W. Letterman	Gravelly	0.8647		827	849	1015
	1077	do	do	do	do	0.8490		888	957	966
	1092	do	do	do	Flinty	0.8387		610	647	710
152. Cornus Nuttallii *Flowering Dogwood.*	960	Oregon	Portland	G. Engelmann and C. S. Sargent.		0.7763		814	976	930
	960	do	do	do		0.7807		976	1085	1052
153. Nyssa capitata *Ogeechee Lime. Sour Tupelo. Gopher Plum.*	605	Georgia	Ogeechee river	A. H. Curtiss	Swampy	0.5739		610	638	694
	605	do	do	do	do	0.6170		697	723	668
154. Nyssa sylvatica *Tupelo. Sour Gum. Pepperidge. Black Gum.*	235	South Carolina	Bonneau's Depot	H. W. Ravenel	Muck	0.5966		687	781	783
	235	do	do	do	do	0.5735		888	849	745
	517	Tennessee	Cumberland river	A. Gattinger		0.5979		814	814	689
	750	Florida	Chattahoochee	A. H. Curtiss	Clay	0.7885		800	849	996
	750	do	do	do	do	0.7936		763	781	952
	813	West Virginia	Grafton	C. G. Pringle		0.6222		939	888	788
	813	do	do	do		0.6447		888	1030	899
	833	Massachusetts	West Newbury	J. Robinson	Rich	0.7364		740	769	912
	833	do	do	do	do	0.7534		651	814	736
	834	do	do	do	do	0.7293		660	713	827
	834	do	do	do	do	0.6800		814	872	924
	835	do	Chebacco pond	do		0.7914		642	651	717
155. Nyssa uniflora *Large Tupelo. Cotton Gum. Tupelo Gum.*	128	South Carolina	Bonneau's Depot	H. W. Ravenel	Swampy	0.6648		542	592	701
	128	do	do	do	do	0.6135		561	564	724
	550	Alabama	Stockton	C. Mohr	Alluvial	0.5455		444	471	628
	550	do	do	do	do	0.5228		595	585	687
	604	Georgia	Ogeechee river	A. H. Curtiss	Swampy	0.5739		456	444	635
	604	do	do	do	do	0.5841		488	444	553
CAPRIFOLIACEÆ.										
156. Sambucus glauca *Elder.*	681	California	Contra Costa county	G. R. Vasey	Gravelly	0.5216		348	305	370
159. Viburnum prunifolium *Black Haw. Stag Bush.*	110[2]	Kentucky	Mercer county	W. M. Linney	Hudson River shale.	0.8352		976	957	729
	110[4]	do	do	do	Trenton limestone	0.9034		904	1028	1228
	739	Georgia	Bainbridge	A. H. Curtiss	Clay	0.8270		708	734	898
RUBIACEÆ.										
160. Exostemma Caribæum	466	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.9554		1136	1085	956
	466	do	do	do	do	0.9524		1221	1302	1055
161. Pinckneya pubens *Georgia Bark.*	381	South Carolina	Bluffton	J. H. Mellichamp	Sandy swamp	0.5425		660	683	405

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
3.0	6.2	9.5	12.5	0.3	13.0	16.5	21.0	26.0	32.0	43.5	.....	.....	450	Shattered	1119
4.8	9.0	13.5	18.5	0.7	18.5	23.5	30.3	37.0	46.5	61.5	.....	.....	500	Splintered	1135
4.1	8.1	12.5	17.0	0.9	17.0	23.0	28.5	36.0	46.5	62.0	.....	.....	503	Specimen cross-grained; splintered	1127
4.2	8.3	12.5	16.8	0.6	17.5	22.4	29.0	35.0	46.0	61.5	.....	.....	500	Broke with coarse splinters	1127
6.2	12.0	18.2	26.9	2.2	27.6	36.0	50.0	70.0	.....	.....	.....	.....	372	Broke at knot	67
6.2	11.5	17.0	24.5	2.0	25.5	32.7	43.1	58.2	84.5	.....	.....	.....	432	Maximum deflection, 120 millimeters; broke with large splinters	67
6.2	12.3	20.0	29.0	3.5	31.2	40.5	56.0	.....	.....	.....	.....	.....	350	Broke with large splinters	761
6.2	11.5	18.2	26.7	2.2	28.5	36.5	52.0	68.0	110.0	.....	.....	.....	406	Square break on tension side with large flakes	812
6.4	12.0	18.7	27.0	2.5	28.6	39.0	55.0	87.0	.....	.....	.....	.....	378	Square break on tension side with long splinters	812
5.9	11.5	16.7	23.6	1.5	24.5	32.0	43.0	60.5	81.5	.....	.....	.....	433	Broke with long, coarse splinters	1077
5.5	10.2	16.3	24.0	1.6	24.6	32.0	42.5	57.0	.....	.....	.....	.....	412	Shattered one end	1077
8.0	15.2	24.5	35.3	3.6	37.0	48.5	76.0	.....	.....	.....	.....	.....	303	Specimen cross-grained; broke with large splinters	1092
6.0	10.0	14.5	20.3	0.9	20.3	25.5	32.0	42.5	.....	.....	.....	.....	397	Broke with long splinters	960
5.0	9.0	13.2	17.5	0.4	18.0	23.0	29.0	34.0	43.0	.....	.....	.....	449	do	960
8.0	15.3	25.0	37.3	3.3	38.0	52.0	.....	.....	.....	.....	.....	.....	296	Broke short and split in axis	605
7.0	13.5	20.3	29.5	2.2	30.5	41.0	.....	.....	.....	.....	.....	.....	285	Shattered	605
7.1	12.5	19.6	27.5	1.6	28.2	37.5	51.0	.....	.....	.....	.....	.....	334	do	235
5.5	11.5	18.0	25.5	1.5	26.3	34.7	54.5	.....	.....	.....	.....	.....	318	do	235
6.0	12.0	19.5	28.7	2.4	29.5	38.0	.....	.....	.....	.....	.....	.....	294	Long split at one end	517
6.1	11.5	17.7	25.7	2.0	26.0	34.0	46.0	63.0	93.0	.....	.....	.....	425	Broke into fine splinters	750
6.4	12.5	19.0	26.5	2.0	27.5	37.0	48.5	74.0	120.0	.....	.....	.....	406	Deflected 150 millimeters and slipped from the bearing	750
5.2	11.0	16.2	22.5	0.4	23.0	29.0	38.0	.....	.....	.....	.....	.....	334	Shattered	813
5.5	9.4	13.5	18.0	0.4	18.2	22.0	27.5	35.0	.....	.....	.....	.....	388	do	813
6.6	12.7	19.7	28.7	2.3	29.7	38.0	53.0	84.0	.....	.....	.....	.....	389	Sap-wood; broke with fine splinters	833
7.5	12.0	19.0	29.0	3.0	30.0	42.0	57.5	95.0	.....	.....	.....	.....	377	do	833
7.4	13.7	21.6	32.0	3.5	33.5	45.0	66.0	116.0	.....	.....	.....	.....	353	do	834
6.0	11.2	17.0	25.0	2.2	25.2	32.5	44.0	64.0	.....	.....	.....	.....	394	Failed from small splinter on corner	834
7.6	15.0	26.0	38.5	5.5	40.6	58.0	100.0	.....	.....	.....	.....	.....	306	Crumpled on compression side at knot; square break with fine splinters.	835
9.0	16.5	29.0	44.5	7.2	46.0	60.0	.....	.....	.....	.....	.....	.....	299	Broke with long splinters	128
8.7	17.3	28.7	43.0	7.5	45.5	66.2	108.0	.....	.....	.....	.....	.....	309	Shattered at the end	128
11.0	20.7	33.0	48.5	8.5	53.0	82.0	.....	.....	.....	.....	.....	.....	268	Crushed at center bearing; broke with long splinters	550
8.2	16.7	26.7	39.0	5.0	40.8	59.5	.....	.....	.....	.....	.....	.....	293	do	550
10.7	22.0	36.5	57.5	11.5	62.5	108.0	.....	.....	.....	.....	.....	.....	271	Failed from large splinter on corner	604
10.0	22.0	36.5	58.0	12.2	60.5	.....	.....	.....	.....	.....	.....	.....	236	do	604
14.0	32.0	55.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	158	Broke at knot	681
5.0	10.2	14.7	20.6	3.5	21.0	27.0	34.0	.....	.....	.....	.....	.....	311	do	110[2]
5.4	9.5	14.6	19.7	0.9	21.0	26.0	33.5	41.0	51.0	68.5	92.0	.....	524	Broke at knot with one large splinter	110[4]
6.9	13.3	20.7	29.0	3.0	31.0	40.0	53.0	71.0	.....	.....	.....	.....	383	Shattered	739
4.3	9.0	11.5	15.5	0.4	15.7	20.0	23.7	28.0	33.5	.....	.....	.....	408	Specimen cross-grained; split with grain	466
4.0	7.5	11.4	15.2	0.5	15.4	19.0	23.0	28.5	33.0	38.0	.....	.....	450	Broke with fine splinters	466
7.4	14.3	22.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	173	Broke at knot with large splinters	381

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
ERICACEÆ.										
165. Andromeda ferruginea	1033	Florida	Jacksonville	A. H. Curtiss	Hummock	0.7273		814	814	680
166. Arbutus Menziesii *Madroña.*	643	California	Contra Costa county	G. R. Vasey	Gravelly	0.7200		740	794	893
	643	do	do	do	do	0.7000		610	626	827
	679	do	Marin county	do	do	0.7454		976	1002	1015
	679	do	do	do	do	0.7546		842	872	898
167. Arbutus Xalapensis	683	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.		0.7670		651	683	680
	683	do	do	do		0.7501		531	549	546
169. Oxydendrum arboreum *Sorrel Tree. Sour Wood.*	353	Alabama	Cottage Hill	C. Mohr	Light, rich	0.7386		787	800	469
	353	do	do	do	do	0.7501		939	976	979
170. Kalmia latifolia *Laurel. Calico Bush. Spoon Wood. Ivy.*	262[2]	Virginia	Fancy Gap	H. Shrivor	Moist	0.7642		651	670	696
	262[3]	do	do	do	do	0.6901		465	500	584
171. Rhododendron maximum *Great Laurel. Rose Bay.*	263[1]	do	do	do	do	0.6216		651	673	691
	263[2]	do	do	do	do	0.6403		610	618	633
SAPOTACEÆ.										
175. Chrysophyllum oliviforme	492	Florida	Bay Biscayne	A. H. Curtiss	Coral	0.9663		1136	1252	947
	492	do	do	do	do	0.9583		921	996	1237
176. Sideroxylon Mastichodendron *Mastic.*	461	do	Upper Metacombe Key.	do	do	0.9872		976	1149	919
	461	do	do	do	do	0.9827		976	1050	1022
177. Dipholis salicifolia *Bustic. Cassada.*	488	do	Bay Biscayne	do	do	0.9602		1356	1436	1263
	488	do	do	do	do	0.9173		1395	1395	1171
	500	do	Umbrella Key	do	do	0.8823		1191	1177	1008
178. Bumelia tenax	746	Georgia	Bainbridge	do	Low	0.7914		751	751	673
179. Bumelia lanuginosa *Gum Elastic. Shittim Wood.*	930	Texas	Austin	C. Mohr	Limestone	0.5847		488	496	567
	930	do	do	do	do	0.5903		478	492	265
	1083	Missouri	Allenton	G. W. Letterman	do	0.7148		488	522	330
181. Bumelia lycioides *Iron Wood. Southern Buckthorn.*	333	Tennessee	Nashville	A. Gattinger	Alluvial	0.8001		697	781	562
182. Bumelia cuneata *Ants' Wood. Downward Plum. Saffron Plum.*	1124	Florida	Boca Chica Key	A. H. Curtiss	Coral	0.8630		660	603	516
183. Mimusops Sieberi *Wild Dilly.*	458	do	Upper Metacombe Key.	do	do	1.0786		996	1028	952
	458	do	do	do	do	1.0191		939	976	874
EBENACEÆ.										
184. Diospyros Virginiana *Persimmon.*	61	Missouri	Allenton	G. W. Letterman	Rich upland	0.7633		814	794	483
	61	do	do	do	do	0.7362		751	751	818
	425	Tennessee	Nashville	A. Gattinger	Rich loam	0.8716		1395	1337	1289
	811	West Virginia	Grafton	C. G. Pringle		0.8176		610	622	895
	811	do	do	do		0.8119		610	603	883
	1084	Missouri	Allenton	G. W. Letterman	Rich upland	0.8125		751	814	932
	1084	do	do	do	do	0.8410		574	603	846
	1162	do	do	do	Rich	0.8240		697	734	883
STYRACACEÆ.										
186. Symplocos tinctoria *Horse Sugar. Sweet Leaf.*	347	Alabama	Cottage Hill	C. Mohr	Sandy	0.5580		610	622	619
187. Halesia diptera *Snow-drop Tree. Silver-bell Tree.*	738	Georgia	Bainbridge	A. H. Curtiss	Low	0.6704		642	673	881
	738	do	do	do	do	0.6577		660	697	832

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS OF—													Ultimate strength; transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
6.0	12.0	18.5	26.0	2.0	27.5	35.0	.....	.....	.....	.....	.....	.....	290	Broke at knot	1033
6.6	12.3	19.5	27.0	1.8	28.0	35.0	47.5	62.5	.....	.....	.....	.....	381	Specimen cross-grained	643
8.0	15.6	24.0	33.2	2.8	35.0	44.5	59.0	.....	.....	.....	.....	.....	353	.....do	643
5.0	9.2	14.0	19.0	0.6	20.0	25.5	32.5	41.5	53.0	.....	.....	.....	433	Square break	679
5.8	11.2	16.3	22.5	1.0	23.5	30.0	38.2	51.0	.....	.....	.....	.....	383	Threw off large flakes on tension side	679
7.5	14.3	22.0	31.5	2.5	32.8	43.0	.....	.....	.....	.....	.....	.....	294	Large flake on tension side	683
9.1	17.8	29.0	43.5	5.5	46.0	.....	.....	.....	.....	.....	.....	.....	233	Broke at knot; flake on compression side	683
6.2	12.2	19.0	31.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	200	Specimen cross-grained; splinter started at large knot	353
5.2	10.0	15.0	21.0	1.2	21.5	28.0	36.0	47.0	65.0	.....	.....	.....	422	Crushed at center bearing; broke with fine splinters	353
7.5	14.6	22.4	31.2	2.6	33.6	44.5	.....	.....	.....	.....	.....	.....	297	Broke at knot	262[3]
10.5	19.5	31.0	44.0	4.8	47.0	.....	.....	.....	.....	.....	.....	.....	249	Specimen cross-grained; shattered; long split with grain	262[3]
7.5	14.5	22.8	32.5	2.3	33.5	44.0	.....	.....	.....	.....	.....	.....	295	Threw off flake from tension side	263[1]
8.0	15.8	25.0	34.2	2.8	35.5	46.0	.....	.....	.....	.....	.....	.....	270	Broke at knot	263[2]
4.3	*7.8*	*12.0*	*16.4*	*0.9*	*17.4*	*21.8*	*28.2*	*35.0*	*46.0*	.....	.....	.....	*404*	*Specimen cross-grained*	492
5.3	9.8	15.5	21.0	1.6	22.0	38.5	37.2	.....	.....	.....	.....	.....	328	.....do	492
5.0	8.5	12.8	17.5	0.6	18.0	24.0	30.0	41.0	.....	.....	.....	.....	392	Broke with large splinters	461
5.0	9.3	13.6	18.3	0.9	19.0	23.5	30.0	38.0	49.0	.....	.....	.....	436	Broke with coarse splinters	461
3.6	6.8	10.0	13.0	0.3	13.7	17.0	20.0	25.0	30.0	37.0	45.0	.....	539	Broke with long, coarse splinters	488
3.5	7.0	10.6	14.0	0.3	14.5	18.0	22.0	27.0	31.5	37.5	49.0	.....	500	.....do	488
4.1	8.3	12.3	16.6	0.4	17.0	21.5	27.0	33.5	40.0	.....	.....	.....	430	Broke at knot with long, coarse splinters	500
6.5	13.0	20.0	29.5	2.8	31.5	41.6	.....	.....	.....	.....	.....	.....	287	Specimen cross-grained; broke at knot	746
10.0	19.7	31.5	46.0	7.0	49.2	.....	.....	.....	.....	.....	.....	.....	242	Broke with a large splinter	930
10.2	22.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	113	Broke with large splinter at knot	930
10.0	18.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	141	Defective specimen; broke at knot	1083
7.0	12.5	19.5	28.5	2.4	29.7	.....	.....	.....	.....	.....	.....	.....	240	Broke at knot with one large splinter	333
7.4	16.2	26.7	40.6	7.5	43.5	.....	.....	.....	.....	.....	.....	.....	220	Specimen cross-grained; large flake on compression side	1124
4.9	9.5	14.7	19.7	1.0	20.0	25.2	32.0	39.7	48.7	.....	.....	.....	406	Specimen cross-grained; broke at knot	458
5.2	10.0	15.0	20.2	0.8	21.0	26.5	33.2	42.5	.....	.....	.....	.....	373	Specimen cross-grained; large flake from compression side	458
6.0	12.3	18.0	26.2	2.0	28.0	36.0	51.0	.....	.....	.....	.....	.....	206	Specimen cross-grained; short break on tension side, flake from compression side.	61
6.5	13.0	19.4	29.0	3.2	29.7	39.0	55.0	.....	.....	.....	.....	.....	349	Short break on tension side; flake from compression side	61
3.5	7.3	11.0	15.0	0.2	15.0	19.0	24.2	30.0	35.2	43.0	56.0	75.0	550	Broke with fine splinters	425
8.0	15.7	24.8	35.3	4.0	37.9	50.0	70.6	111.5	.....	.....	.....	.....	382	.....do	811
8.0	16.2	25.7	38.0	4.5	39.0	52.5	79.0	115.5	.....	.....	.....	.....	377	Deflected 170 millimeters before breaking; broke with fine splinters	811
6.5	12.0	19.3	28.5	2.5	30.0	38.0	52.0	73.0	.....	.....	.....	.....	398	Square break on tension side, large flake on compression side	1084
8.5	16.2	26.0	38.0	5.2	40.2	55.0	78.0	135.0	.....	.....	.....	.....	361	.....do	1084
7.0	13.3	21.0	30.4	3.0	31.8	40.5	58.0	78.0	.....	.....	.....	.....	377	.....do	1162
8.0	15.7	25.6	40.0	5.5	42.0	63.0	.....	.....	.....	.....	.....	.....	264	Specimen cross-grained	347
7.6	14.5	23.0	32.0	2.5	33.0	44.0	59.0	82.0	.....	.....	.....	.....	376	Shattered at one end	738
7.4	14.0	22.5	32.0	2.6	33.0	43.0	60.0	96.5	.....	.....	.....	.....	355	Broke with large splinters	738

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
OLEACEÆ.										
191. Fraxinus pistaciæfolia *Ash.*	660	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Low	0.6633		514	542	666
	660	do	do	do	do	0.6995		698	660	578
192 Fraxinus Americana *White Ash.*	39[2]	Missouri	Allenton	G. W. Letterman	do	0.6592		1110	1220	928
	114[1]	Michigan	Dansville	W. J. Beal	Clay	0.4983		542	531	586
	114[1]	do	do	do	do	0.5469		698	679	610
	114[3]	do	Hudson	do		0.7535		1061	1163	1041
	114[4]	do	Lansing	do		0.6622		1191	1284	927
	114[5]	do	Dansville	do	Clay	0.5020		814	872	743
	130	South Carolina	Bonneau's Depot	H. W. Ravenel	Wet	0.6914		1191	1284	973
	130	do	do	do	do	0.6864		1136	1221	951
	212	Virginia	Wytheville	H. Shriver		0.6569		976	1085	855
	212	do	do	do		0.6524		939	1007	907
	227	Vermont	Charlotte	C. G. Pringle	Gravelly	0.6347		814	930	813
	227[1]	do	do	do	do	0.6613		888	957	860
	227[2]	do	do	do	do	0.7243		1221	1302	1059
	227[2]	do	do	do	do	0.7151		1479	1525	1289
	267[2]	Virginia	Wytheville	H. Shriver		0.6250		904	976	820
	431	Tennessee	Nashville	A. Gattinger	Limestone	0.6792		1191	1221	968
	551	Alabama	Kemper's mill	C. Mohr	Alluvial	0.6417		976	1085	803
	551	do	do	do	do	0.6038		1085	976	764
	747	Georgia	Bainbridge	A. H. Curtiss	River-bottom	0.6512		660	642	415
	747	do	do	do	do	0.6250		549	564	693
	937	Texas	Austin	C. Mohr	Rich, calcareous	0.7293		697	708	611
	1045	Massachusetts	Reading	J. Robinson		0.7954		814	957	1017
	1045	do	do	do		0.8205		1221	1191	1101
192. Fraxinus Americana, *var.* Texensis.	364	Texas	Dallas	J. Reverchon	Dry, calcareous	0.8194		1085	1028	1115
	364	do	do	do	do	0.7762		1163	1135	1134
193. Fraxinus pubescens *Red Ash.*	139	Michigan	Lansing	W. J. Beal	Poor	0.6416		976	1122	1073
	229	Vermont	Charlotte	C. G. Pringle	Clay	0.7065		729	752	780
	229	do	do	do	do	0.6812		976	976	1040
	1059	Massachusetts	Topsfield	J. Robinson	River-bottom	0.6080		407	398	581
194. Fraxinus viridis *Green Ash.*	57	Missouri	Allenton	G. W. Letterman	Rich, wet	0.7273		610	592	816
	308	Texas	Dallas	J. Reverchon	do	0.5977		610	610	544
	308	do	do	do	do	0.6522		888	930	820
	438	Tennessee	Nashville	A. Gattinger	Rich upland	0.7683		976	1085	961
	948	Texas	Victoria	C. Mohr	Rich, wet	0.7813		888	849	944
	948	do	do	do	do	0.8125		904	976	986
	957	do	Matagorda bay	do	do	0.7022		775	781	937
	957	do	do	do	do	0.7684		1628	1575	1179
	957	do	do	do	do	0.6893		697	729	876
195. Fraxinus platycarpa *Water Ash.*	536	Alabama	Stockton	do	Rich, alluvial	0.4759		443	476	537
196. Fraxinus quadrangulata *Blue Ash.*	66	Missouri	Allenton	G. W. Letterman	Dry upland	0.8424		814	787	951
	66	do	do	do	do	0.8620		842	888	949
	125	Michigan	Lansing	W. J. Beal	Rich loam	0.5189		740	751	677
	125	do	do	do	do	0.5206		634	687	633

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
9.5	18.0	29.5	42.8	5.2	44.5	64.0	.....	.....	.....	.....	.....	.....	234	Square break on tension side with large flake on compression side	660
7.0	14.8	24.2	36.5	4.4	38.0	.....	.....	.....	.....	.....	.....	.....	247	.....do	660
4.4	8.0	11.5	15.9	0.4	16.5	21.0	28.0	37.0	.....	.....	.....	.....	396	Broke with coarse splinters	39[2]
9.0	18.4	29.5	47.4	6.2	50.6	.....	.....	.....	.....	.....	.....	.....	250	Long, shattered break	114[1]
7.0	14.4	23.2	35.5	4.2	39.0	54.0	.....	.....	.....	.....	.....	.....	264	Short break on tension side	114[1]
4.6	8.4	12.3	17.0	1.0	17.5	22.5	30.7	39.0	56.5	.....	.....	.....	444	Sap-wood; broke with fine splinters	114[3]
4.1	7.6	11.5	15.0	0.4	15.2	19.0	24.0	30.5	41.0	.....	.....	.....	415	Broke with coarse splinters	114[4]
6.0	11.2	17.8	26.3	2.0	27.5	37.2	58.0	.....	.....	.....	.....	.....	317	Broke with fine splinters	114[5]
4.1	7.6	11.6	16.0	0.3	16.0	20.7	26.2	33.2	45.5	.....	.....	.....	415	Broke with large splinters on tension side	130
4.3	8.0	11.4	15.8	0.3	16.0	20.4	26.4	35.0	47.0	.....	.....	.....	406	Broke with fine splinters on tension side	130
5.0	9.0	14.0	19.0	0.5	19.5	26.0	34.5	50.0	.....	.....	.....	.....	365	Broke with large splinters on tension side	212
5.2	9.7	14.6	20.0	1.0	20.3	26.6	35.0	50.0	.....	.....	.....	.....	387	.....do	212
6.0	10.5	15.5	22.0	1.0	22.0	29.3	39.0	.....	.....	.....	.....	.....	347	.....do	227
5.5	10.2	16.0	22.8	1.1	23.5	31.0	41.5	60.0	.....	.....	.....	.....	367	.....do	227[1]
4.0	7.5	11.3	15.2	0.3	15.3	19.3	24.8	30.2	38.2	51.2	.....	.....	452	Specimen cross-grained; broke with long splinters	227[2]
3.3	6.4	9.8	13.0	0.2	13.0	16.0	19.7	23.7	29.0	35.5	45.0	59.0	550	Failed from splinter on corner	227[2]
5.4	10.0	14.2	19.5	0.6	20.7	27.0	36.0	.....	.....	.....	.....	.....	350	Square break on tension side with flake on compression side	267[2]
4.1	8.0	12.2	16.5	0.5	17.0	21.2	27.5	35.0	48.5	.....	.....	.....	413	Square break with large splinters on tension side	431
5.0	9.0	13.0	19.0	1.0	19.5	26.0	35.0	.....	.....	.....	.....	.....	343	Broke with large splinters on tension side	551
4.5	10.0	14.5	21.5	1.3	22.5	30.0	42.0	.....	.....	.....	.....	.....	326	.....do	551
7.4	15.2	25.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	177	Specimen cross-grained; broke at knot	747
8.9	17.3	27.6	39.2	4.2	41.0	56.2	.....	.....	.....	.....	.....	.....	296	Broke with large splinters on tension side	747
7.0	13.8	22.0	32.3	3.6	33.2	44.5	.....	.....	.....	.....	.....	.....	261	Specimen cross-grained; broke at knot	937
6.0	10.2	15.2	21.5	1.5	22.0	28.2	36.5	47.0	65.0	.....	.....	.....	434	Broke with large splinters on tension side	1045
4.0	8.2	12.8	17.0	0.9	17.5	22.5	29.0	37.0	49.5	72.0	.....	.....	470	Broke with fine splinters on tension side	1045
4.5	9.5	13.0	17.6	0.7	18.3	23.0	30.7	38.5	53.6	79.5	.....	.....	476	Broke with fine splinters	364
4.2	8.6	13.0	18.0	0.5	18.4	23.5	30.5	38.0	46.0	63.5	.....	.....	484	Broke with fine splinters; buckled on compression side	364
5.0	8.7	12.8	17.6	1.0	17.7	22.5	28.5	35.4	45.7	63.2	.....	.....	458	Crushed at center bearing; broke with fine splinters	139
6.7	13.0	21.5	32.2	5.0	33.2	45.5	64.5	.....	.....	.....	.....	.....	333	Broke with large flake on compression side	229
5.0	10.0	15.0	21.0	1.7	21.6	27.3	35.4	47.0	65.7	.....	.....	.....	444	Failed from two large splinters on angles of tension side	229
12.0	24.5	44.2	76.0	18.5	81.0	.....	.....	.....	.....	.....	.....	.....	248	Square break with large flake on compression side	1059
8.0	16.5	27.2	39.5	5.8	41.0	56.0	94.0	.....	.....	.....	.....	.....	348	Broke with small splinters	57
8.0	16.0	24.5	36.0	3.5	37.6	.....	.....	.....	.....	.....	.....	.....	232	Sap-wood; square break, splitting in axis	308
5.5	10.5	15.5	21.0	0.8	21.3	27.5	38.0	51.0	.....	.....	.....	.....	350	Specimen cross-grained; split in axis	308
5.0	9.0	13.5	19.0	1.0	19.5	24.6	32.4	42.0	61.0	.....	.....	.....	410	Broke with fine splinters	438
5.5	11.5	18.0	26.2	2.4	26.5	35.0	47.0	64.5	110.0	.....	.....	.....	403	.....do	948
5.4	10.0	15.0	21.0	1.1	21.0	28.5	38.0	50.5	90.0	.....	.....	.....	421	.....do	948
6.3	12.5	19.0	26.1	1.8	26.4	34.0	45.5	60.0	.....	.....	.....	.....	400	.....do	957
3.0	6.2	9.4	12.7	0.5	12.9	16.0	21.0	26.5	32.5	41.0	58.0	.....	503	.....do	957
7.0	13.4	20.6	30.0	2.5	30.2	41.6	57.0	84.0	.....	.....	.....	.....	374	Square break on tension side; split in axis	957
11.0	20.5	33.5	52.2	7.0	56.0	.....	.....	.....	.....	.....	.....	.....	229	Short break; shattered	536
6.0	12.4	19.5	27.2	2.0	28.0	38.0	52.0	72.5	.....	.....	.....	.....	406	Broke with fine splinters at small knot on compression side	66
5.8	11.0	17.0	23.2	1.4	24.0	31.2	41.2	58.5	.....	.....	.....	.....	405	.....do	66
6.6	13.0	20.2	29.4	2.1	30.5	43.0	.....	.....	.....	.....	.....	.....	289	Split and shattered	125
7.7	14.2	22.0	32.0	2.0	33.0	44.0	.....	.....	.....	.....	.....	.....	270	Square break on tension side with large flake on compression side	125

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	COEFFICIENT OF ELASTICITY. First deflection.	COEFFICIENT OF ELASTICITY. Second deflection.	[illegible]
196. Fraxinus quadrangulata—cont'd	286[1]	Kentucky	Mercer county	W. M. Linney	Limestone	0.7989		976	1028	[illegible]
	286[2]	do	do	do	do	0.7914		697	697	[illegible]
	291	Missouri	Allenton	G. W. Letterman	Sandy loam	0.6080		651	697	[illegible]
	518	Tennessee	Nashville	A. Gattinger	Rich limestone	0.7923		610	651	[illegible]
197. Fraxinus Oregana *Oregon Ash.*	964	Oregon	Portland	G. Engelmann and C. S. Sargent.	Low, wet	0.6182		939	948	[illegible]
	964	do	do	do	do	0.6057		842	939	[illegible]
	1001	do	Weidler's saw-mill	do		0.6285		888	913	[illegible]
	1001	do	do	do		0.6001		740	781	[illegible]
	1024	do	Portland Furniture Company.	do		0.4894		478	474	[illegible]
	1024	do	do	do		0.4832		425	425	[illegible]
	1030	do	do	do		0.6430		1002	1085	[illegible]
	1030	do	do	do		0.6419		1220	1220	[illegible]
198. Fraxinus sambucifolia *Black Ash. Hoop Ash. Ground Ash.*	122	Michigan	Dansville	W. J. Beal	Wet, peaty	0.5215		814	814	[illegible]
	147	Illinois	Waukegan	Robert Douglas	Low, wet	0.7371		976	1062	[illegible]
	839	Massachusetts	Danvers	J. Robinson	Rich, loamy	0.7365		888	849	[illegible]
	839	do	do	do	do	0.7575		814	763	[illegible]
199. Forestiera acuminata *Privet.*	737	Georgia	Bainbridge	A. H. Curtiss		0.5875		610	502	[illegible]
	737	do	do	do		0.5814		872	814	[illegible]
201. Osmanthus Americanus *Devil Wood.*	283	Louisiana	Amite	C. Mohr	Rich, alluvial	0.8762		1221	1328	[illegible]
	283	do	do	do	do	0.8455		1062	1221	[illegible]
	584	Florida	Saint John's river	A. H. Curtiss	Sandy loam	0.7330		1085	1130	[illegible]
BORRAGINACEÆ.										
204. Bourreria Havanensis *Strong Bark.*	1137	do	Key Largo	do	Coral	0.7984		888	996	[illegible]
205. Ehretia elliptica *Knackaway. Anaqua.*	942	Texas	New Braunfels	C. Mohr	Rich, alluvial	0.6640		425	397	[illegible]
BIGNONIACEÆ.										
206. Catalpa bignonioides *Catalpa. Catawba. Bean Tree. Cigar Tree. Indian Bean.*	540	Alabama	Stockton	do	Low, wet	0.4816		669	697	[illegible]
	744	Georgia	Bainbridge	A. H. Curtiss	Clay	0.4413		574	610	[illegible]
	744	do	do	do	do	0.4352		567	591	[illegible]
	744	do	do	do	do	0.4585		814	898	691
207. Catalpa speciosa *Western Catalpa.*	38	Missouri	Charleston	C. S. Sargent	Wet clay	0.4915		787	849	[illegible]
	38	do	do	do	do	0.4915		763	704	[illegible]
208. Chilopsis saligna *Desert Willow.*	682	Arizona	Tuscon	G. Engelmann and C. S. Sargent.	Moist, gravelly	0.6193		514	514	[illegible]
	682	do	do	do	do	0.5716		555	574	[illegible]
VERBENACEÆ.										
210. Citharexylum villosum *Fiddle Wood.*	490	Florida	Bay Biscayne	A. H. Curtiss	Coral	1.0323		1169	1177	[illegible]
	490	do	do	do	do	1.0360		1320	[illegible]	[illegible]
NYCTAGINACEÆ.										
212. Pisonia obtusata *Pigeon Wood. Beef Wood. Cork Wood. Pork Wood.*	474	do	Upper Metacombe Key.	do	do	0.6884		465	[illegible]	[illegible]
POLYGONACEÆ.										
213. Coccoloba Floridana *Pigeon Plum.*	473	do	do	do	do	0.9718		1169	[illegible]	[illegible]
	473	do	do	do	do	0.9752		1017	[illegible]	[illegible]
LAURACEÆ.										
215. Persea Carolinensis *Red Bay.*	585	do	Saint John's river	do	Sandy loam	0.6427		814	[illegible]	[illegible]
	585	do	do	do	do	0.6489		814	[illegible]	[illegible]
215. Persea Carolinensis, *var.* palustris.	340	Alabama	Mobile county	C. Mohr	Damp, sandy	0.6216		814	830	[illegible]

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
5.0	9.5	14.3	19.3	0.6	20.0	25.0	31.2	38.0	47.0	61.0	.....	.....	471	Specimen cross-grained; split	286[1]
7.0	14.0	21.0	29.6	2.7	32.0	44.2	66.0	.....	.....	.....	.....	.....	305	Failed at knot	286[2]
7.5	14.0	21.4	30.6	2.3	32.0	41.0	59.0	.....	.....	.....	.....	.....	313	Broke with coarse splinters; shattered	291
8.0	15.0	23.4	33.0	3.5	35.0	46.5	66.5	.....	.....	.....	.....	.....	312	Shattered	518
5.2	10.3	15.0	20.8	0.7	21.5	28.0	39.0	.....	.....	.....	.....	.....	350	Square break on tension side with split in axis	964
5.8	10.4	16.0	22.0	0.9	22.5	30.0	41.0	.....	.....	.....	.....	.....	323	Shattered	964
5.5	10.7	16.2	21.6	0.5	22.5	28.0	36.0	.....	.....	.....	.....	.....	343	*Specimen cross-grained*; square break on tension side, flake on compression side.	1001
6.6	12.5	18.7	25.7	1.0	26.0	34.0	45.5	.....	.....	.....	.....	.....	311	Specimen cross-grained	1001
10.2	20.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140	.....do	1024
11.5	23.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150	Specimen cross-grained; flake on tension side	1024
4.6	9.0	13.0	18.0	0.6	18.5	23.5	30.2	.....	.....	.....	.....	.....	315	Specimen cross-grained; break started at knot	1030
4.0	8.0	12.5	17.0	0.4	17.3	21.8	.....	.....	.....	.....	.....	.....	327	.....do	1030
6.0	12.0	19.0	26.5	1.6	28.7	39.0	.....	.....	.....	.....	.....	.....	261	Square break on tension side with coarse splinters	122
5.0	9.2	14.0	20.6	1.7	21.0	28.0	36.0	49.0	74.0	.....	.....	.....	417	Square break with two large splinters	147
5.5	11.5	18.0	26.0	2.5	27.5	35.7	53.0	81.5	.....	.....	.....	.....	350	Square break on tension side with coarse splinters	839
6.0	12.8	22.0	31.2	3.9	34.0	48.0	71.0	.....	.....	.....	.....	.....	346	.....do	839
8.0	16.5	26.5	38.7	4.5	42.0	61.0	.....	.....	.....	.....	.....	.....	298	Square break on tension side; shattered	737
5.6	12.0	18.0	27.0	2.0	28.2	38.0	64.5	.....	.....	.....	.....	.....	313	.....do	737
4.0	7.3	11.2	15.3	0.4	17.7	20.0	24.5	31.0	37.0	46.0	60.5	.....	513	Square break on tension side, splitting in the axis with fine splinters.	283
4.6	8.0	12.7	17.8	1.0	18.0	23.5	30.0	37.0	48.0	.....	.....	.....	433	*Sap-wood; specimen cross-grained; broke with long splinters*	283
4.5	8.6	13.0	18.0	1.0	18.2	23.5	30.0	39.5	55.0	.....	.....	.....	400	.....do	584
5.5	9.8	14.6	19.8	0.5	20.0	25.0	32.0	40.0	50.0	.....	.....	.....	403	Specimen cross-grained; splintered	1137
11.5	24.6	36.0	53.0	6.9	56.0	77.5	131.0	.....	.....	.....	.....	.....	308	Specimen cross-grained; square break on tension side; split in axis.	942
7.3	14.0	21.5	31.0	2.4	32.5	44.0	.....	.....	.....	.....	.....	.....	291	Broke with coarse splinters	540
8.5	16.0	26.0	37.6	4.5	41.0	.....	.....	.....	.....	.....	.....	.....	223	Crushed at center bearing; broke with coarse splinters	744
8.6	18.4	31.0	63.0	17.5	.....	.....	.....	.....	.....	.....	.....	.....	200	.....do	744
6.0	11.0	18.0	25.2	1.4	26.0	35.0	.....	.....	.....	.....	.....	.....	295	.....do	744
6.2	11.5	17.0	23.5	1.2	24.3	33.2	.....	.....	.....	.....	.....	.....	287	Crushed at center bearing; splintered	38
6.4	12.3	20.4	30.0	2.6	30.7	53.0	.....	.....	.....	.....	.....	.....	254	.....do	38
9.5	19.0	31.6	50.5	6.0	.....	.....	.....	.....	.....	.....	.....	.....	200	Splintered on corner	632
8.8	17.0	26.0	37.0	3.0	38.0	54.0	.....	.....	.....	.....	.....	.....	204	Specimen cross-grained	682
4.2	8.3	12.5	17.5	0.7	18.0	23.0	.....	.....	.....	.....	.....	.....	360	Specimen cross-grained; broke at knots	490
3.7	7.3	11.4	15.0	0.4	15.7	20.0	25.0	30.0	37.0	46.0	.....	.....	499	Broke with fine splinters	490
10.5	21.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	127	Specimen cross-grained; failed from large splinters on corner	474
4.2	8.0	12.4	16.8	0.4	17.5	21.5	26.5	32.0	.....	.....	.....	.....	400	Shattered; large flakes on tension side	473
4.8	9.3	13.5	19.0	0.8	18.7	24.0	31.0	39.0	.....	.....	.....	.....	383	Broke with coarse splinters	473
6.0	11.3	18.0	24.3	1.0	25.0	31.0	40.0	50.0	.....	.....	.....	.....	393	Shattered	585
6.0	12.0	17.6	24.3	1.2	24.2	30.2	40.0	51.0	.....	.....	.....	.....	377	..... do	585
6.0	11.5	16.6	23.6	1.3	24.0	32.0	42.0	57.5	.....	.....	.....	.....	350	Broke with coarse splinters	340

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
217. Sassafras officinale *Sassafras.*	71	Missouri	Allenton	G. W. Letterman	Low, rich	0.5286		567	561	886
	71	do	do	do	do	0.4569		574	626	708
	387	do	do	do	Alluvial	0.4546		443	465	361
	387	do	do	do	do	0.4818		610	651	703
	446	Tennessee	Nashville	A. Gattinger	Rich	0.4824		651	673	658
	814	West Virginia	Grafton	C. G. Pringle		0.5849		567	542	600
	814	do	do	do		0.5828		488	501	673
	854	Massachusetts	Danvers	J. Robinson	Rich loam	0.4829		348	337	368
	854	do	do	do	do	0.5034		325	315	464
218. Umbellularia Californica *Mountain Laurel. California Laurel. Spice Tree. Cagiput. California Olive. California Bay Tree.*	703	Oregon	Coos bay	G. Engelmann and C. S. Sargent.		0.6813		1085	1149	937
	703	do	do	do		0.6755		888	986	675
EUPHORBIACEÆ.										
219. Drypetes crocea *Guiana Plum. White Wood.*	408	Florida	Upper Metacombe Key.	A. H. Curtiss	Coral	0.9304		976	1039	797
219. Drypetes crocea, *var.* latifolia	459	do	do	do	do	0.9391		842	872	591
	459	do	do	do	do	0.9218		751	800	825
URTICACEÆ.										
222. Ulmus crassifolia *Cedar Elm.*	324	Texas	Dallas	J. Reverchon	Rich loam	0.6706		751	781	809
	324	do	do	do	do	0.7348		814	888	733
	929	do	Austin	C. Mohr	do	0.8375		626	610	787
	929	do	do	do	do	0.8682		519	531	762
223. Ulmus fulva *Red Elm. Slippery Elm. Moose Elm.*	30[1]	Kentucky	Mercer county	W. M. Linney	Limestone	0.5875		976	976	783
	134	Missouri	Allenton	G. W. Letterman	Rich, alluvial	0.7200		888	930	937
	134	do	do	do	do	0.6933		1017	1062	937
	369	Vermont	Charlotte	C. G. Pringle	Gravelly	0.6767		814	939	973
	429	Tennessee	Nashville	A. Gattinger	Clay	0.6821		814	857	712
224. Ulmus Americana *White Elm. American Elm. Water Elm.*	19	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.6920		976	976	989
	19	do	do	do	do	0.7080		921	939	1050
	281	Missouri	Allenton	G. W. Letterman	Alluvial	0.6477		718	718	794
	958	Texas	Colorado river	C. Mohr	Alluvial	0.6596		751	800	813
	958	do	do	do	do	0.6168		729	835	895
	1036	Massachusetts	Danvers	J. Robinson	Gravelly	0.7370		400	391	574
	1036	do	do	do	do	0.7359		542	514	649
	1049	do	North Reading	do	do	0.7660		828	849	1010
	1049	do	do	do	do	0.7159		814	857	923
225. Ulmus racemosa *Rock Elm. Cork Elm. Hickory Elm. White Elm. Cliff Elm.*	116[1]	Michigan	Dansville	W. J. Beal	do	0.8562		1136	1190	1361
	116[2]	do	Big Rapids	do	do	0.6245		814	921	886
	116[3]	do	do	do	Low, gravelly	0.6839		1136	1221	1055
	116[5]	do	Hudson	do	Alluvial	0.7461		996	1073	1094
	314	do	Hersey	do	Rich loam	0.7677		1220	1302	1165
	314	do	do	do	do	0.7466		1163	1268	1036
	428	Tennessee	Nashville	A. Gattinger	do	0.7442		651	697	869
226. Ulmus alata *Wahoo. Winged Elm.*	133	South Carolina	Bonneau's Depot	H. W. Ravenel	do	0.8768		452	479	745
	380	Tennessee	Davidson county	A. Gattinger	Loam	0.6615		574	568	703
	533	Mississippi	Kemper's Mill	C. Mohr	Alluvial	0.8243		610	651	820
	533	do	do	do	do	0.7883		697	687	900

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
8.6	17.4	28.0	40.7	4.5	44.0	66.0	.....	.....	.....	.....	.....	.....	378	Broke short and split	71
8.5	15.0	23.4	33.8	2.7	35.5	47.5	80.0	.....	.....	.....	.....	.....	302	Broke with fine splinters	71
11.0	21.0	35.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	154	Shattered	387
8.0	15.0	23.2	34.0	3.1	36.0	.....	.....	.....	.....	.....	.....	.....	300	.....do	387
7.5	14.5	22.0	32.5	2.0	34.0	47.0	.....	.....	.....	.....	.....	.....	281	Coarse splinters	446
8.6	18.0	29.6	45.0	6.2	46.0	74.0	.....	.....	.....	.....	.....	.....	256	Shattered	814
10.0	19.5	30.0	42.0	4.9	45.7	63.0	.....	.....	.....	.....	.....	.....	287	.....do	814
14.0	29.0	47.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	157	Square break on tension side with large flake on compression side	854
15.0	31.0	52.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	198	.....do	854
4.5	8.5	12.5	17.0	0.6	18.0	22.5	29.5	37.0	.....	.....	.....	.....	400	Specimen cross-grained; split	703
5.5	9.0	15.7	21.0	1.1	21.5	27.5	.....	.....	.....	.....	.....	.....	288	.....do	703
5.0	9.4	14.6	20.0	1.5	20.6	26.0	33.6	.....	.....	.....	.....	.....	340	Shattered	468
5.8	11.2	17.3	24.5	1.6	25.0	32.5	.....	.....	.....	.....	.....	.....	252	Sap-wood; shattered	459
6.5	12.2	19.6	27.2	2.0	27.5	36.5	46.5	61.0	.....	.....	.....	.....	352	Specimen cross-grained; sap-wood; shattered	459
6.5	12.5	20.0	29.0	2.2	30.0	42.0	56.0	.....	.....	.....	.....	.....	345	Broke with coarse splinters	324
6.0	11.0	16.8	23.5	1.3	24.5	31.0	39.2	.....	.....	.....	.....	.....	313	Short break on tension side	324
7.8	16.0	27.5	40.5	6.0	42.0	57.0	84.0	.....	.....	.....	.....	.....	336	Sap-wood; shattered	929
9.4	18.2	31.0	44.0	6.5	47.0	65.0	97.0	.....	.....	.....	.....	.....	325	.....do	929
5.0	10.0	15.2	23.3	1.7	23.6	30.5	47.0	.....	.....	.....	.....	.....	334	Crushed at center bearing; bent and splintered without breaking	39[1]
5.5	10.5	16.0	22.8	1.6	23.5	31.5	43.0	59.2	112.0	.....	.....	.....	400	.....do	134
4.8	9.2	14.0	20.0	1.0	20.8	27.0	36.0	51.2	86.0	.....	.....	.....	400	.....do	134
6.0	10.4	15.5	20.3	1.0	20.3	26.9	35.0	47.5	60.0	.....	.....	.....	415	Thin scale on tension side	369
6.0	11.4	17.0	24.2	1.2	25.2	32.6	50.0	.....	.....	.....	.....	.....	304	Broke with coarse splinters; started at knot	429
5.0	10.0	15.0	20.8	1.0	21.3	26.5	35.0	45.8	64.0	.....	.....	.....	422	0.5 sap-wood; splintered on corners	19
5.3	10.4	14.7	20.4	0.5	21.0	27.0	34.7	45.7	60.0	.....	.....	.....	448	.....do	19
6.8	13.6	21.2	31.0	3.1	31.0	41.0	60.0	.....	.....	.....	.....	.....	339	Broke with coarse splinters	281
6.8	13.0	21.0	30.0	3.0	31.0	41.8	61.5	.....	.....	.....	.....	.....	344	.....do	281
6.5	12.2	19.5	28.0	3.0	29.0	40.0	56.6	.....	.....	.....	.....	.....	347	Broke with fine splinters	958
6.7	11.7	17.0	25.0	2.2	25.6	34.5	47.7	69.5	.....	.....	.....	.....	382	Square break on tension side, splitting in axis	958
12.2	25.0	41.5	69.2	14.4	73.0	.....	.....	.....	.....	.....	.....	.....	245	Specimen cross-grained	1036
9.0	19.0	31.0	46.2	6.2	49.2	71.3	.....	.....	.....	.....	.....	.....	277	Broke with fine splinters	1036
5.9	11.5	17.5	25.5	2.0	26.2	33.2	45.6	63.0	98.2	.....	.....	.....	431	.....do	1049
6.0	11.4	17.5	24.0	1.9	24.0	31.5	44.0	60.0	.....	.....	.....	.....	394	Buckled on compression side; fine splinters	1049
4.3	8.2	12.0	16.7	0.5	17.0	22.0	26.5	34.0	40.8	49.0	64.0	85.0	581	Broke with fine splinters	116[1]
6.0	10.6	16.1	22.0	0.6	23.0	29.0	38.5	53.5	.....	.....	.....	.....	378	Crushed at center bearing; broke with fine splinters	116[2]
4.3	8.0	12.2	16.5	0.4	16.7	21.0	26.5	34.0	46.0	65.0	.....	.....	450	Broke with fine splinters	116[3]
4.9	9.1	13.7	18.2	0.7	18.4	23.0	30.0	38.0	48.5	67.0	.....	.....	467	.....do	116[5]
4.0	7.5	11.0	14.0	0.5	15.0	19.0	24.0	29.4	38.7	52.0	.....	.....	497	.....do	314
4.2	7.7	11.7	15.8	0.5	16.0	20.3	26.0	32.0	44.0	.....	.....	.....	442	.....do	314
7.5	14.0	22.4	33.2	3.5	35.0	45.0	64.0	91.5	.....	.....	.....	.....	371	.....do	428
10.8	20.4	32.0	45.6	5.5	47.0	64.5	94.0	.....	.....	.....	.....	.....	318	Sap-wood; failed at knot	133
8.5	17.2	28.8	43.5	7.2	45.5	59.3	85.5	.....	.....	.....	.....	.....	300	0.75 heart wood; splintered at corners	380
8.0	15.0	23.7	34.0	3.3	35.3	48.0	64.0	96.0	.....	.....	.....	.....	350	Broke with coarse splinters	533
7.0	14.2	26.0	32.3	2.4	33.5	44.5	64.0	97.0	.....	.....	.....	.....	384	Slipped from bearings; buckled large splinter on corner	533

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	Coefficient of elasticity. First deflection.	Coefficient of elasticity. Second deflection.	Modulus of rupture.
227. Planera aquatica	758	Florida	Chattahoochee	A. H. Curtiss	Rich, alluvial	0.5761		509	488	574
	758	do	do	do	do	0.5926		697	751	820
	918	do	do	C. Mohr	do	0.5113		407	415	469
228. Celtis occidentalis *Sugarberry. Hackberry.*	75	Missouri	Allenton	G. W. Letterman	Low, rich	0.5887		610	665	712
	75	do	do	do	Alluvial	0.6023		787	849	808
	306	Texas	Dallas	J. Reverchon	do	0.7239		555	552	738
	306	do	do	do	do	0.7558		478	528	755
	366	do	do	do	do	0.7706		751	697	846
	873	Massachusetts	Salem	J. Robinson	Loam	0.7727		542	504	771
	873	do	do	do	do	0.7920		626	610	762
	1111	Missouri	Saint Louis	Henry Eggert	Moist loam	0.7613		737	763	891
	1111	do	do	do	do	0.7154		976	939	820
228. Celtis occidentalis, *var.* reticulata *Hackberry. Palo Blanco.*	652	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Dry	0.7020		669	651	586
	652	do	do	do	do	0.7882		976	1085	1024
229. Ficus aurea	486	Florida	Bay Biscayne	A. H. Curtiss	Coral	0.3215		317	257	278
	486	do	do	do	do	0.3061		222	.....	199
231. Ficus pedunculata *Wild Fig. India-rubber Tree.*	508	do	Boca Chica Key	do	do	0.5085		407	.....	230
232. Morus rubra *Red Mulberry.*	132	Missouri	Allenton	G. W. Letterman	Rich loam	0.6876		1039	1062	937
	132	do	do	do	do	0.6784		814	904	848
	1244	do	do	do	Upland	0.6516		939	888	766
	1245	do	do	do	do	0.6506		718	814	738
	1246	do	do	do	do	0.6312		697	723	696
	1255	do	do	do	Rich	0.6875		751	697	745
	1255	do	do	do	do	0.6646		634	678	698
234. Maclura aurantiaca *Osage Orange. Bois d'Arc.*	253	Texas	Dallas	J. Reverchon	Bottom	0.8011		857	930	1111
	253	do	do	do	do	0.7027		939	957	1150
PLATANACEÆ.										
235. Platanus occidentalis *Sycamore. Button Wood. Button-ball Tree. Water Beech.*	21	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.5724		407	454	468
	126	Missouri	Allenton	G. W. Letterman	Rich, alluvial	0.6125		888	976	792
	126	do	do	do	do	0.6295		1136	1190	642
236. Platanus racemosa *Sycamore. Button Wood.*	686	California	Carmel river	G. R. Vasey	Clay	0.5170		626	622	586
	686	do	do	do	do	0.4812		595	626	537
237. Platanus Wrightii *Sycamore.*	648	Arizona	Santa Rita mountains.	G. Engelmann and C. S. Sargent.	Rich, gravelly	0.5170		407	425	468
	648	do	do	do	do	0.5369		531	488	387
JUGLANDACEÆ.										
238. Juglans cinerea *Butternut. White Walnut.*	16	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.4829		634	651	368
	16	do	do	do	do	0.4579		763	787	668
	76	Missouri	Allenton	G. W. Letterman	Moist, alluvial	0.4318		814	888	687
	76	do	do	do	do	0.4975		976	1017	649
	76[2]	do	do	do	Rich, moist upland.	0.4943		1136	1221	696
	123	Michigan	Dansville	W. J. Beal	Gravelly clay	0.3864		697	697	560
	393	Michigan	Lansing	do	Gravelly loam	0.3205		488	424	328
	1057	Massachusetts	Topsfield	J. Robinson	Drift	0.5284		814	814	818
239. Juglans nigra *Black Walnut.*	112	Missouri	Allenton	G. W. Letterman	Alluvial	0.5852		904	1039	1029
	117	Michigan	Dansville	W. J. Beal	Gravelly	0.5852		904	976	766
	149	Illinois	Waukegan	Robert Douglas	Loam	0.6031		872	976	726

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
9.6	20.0	33.5	48.5	6.0	49.6								245	Sap-wood; broke through knot	758
7.0	13.0	19.9	27.2	1.7	29.5	37.2	51.0	80.0					350	Specimen cross-grained	758
12.0	23.5	39.0											200	Broke with large splinters; shattered	918
8.0	14.7	23.0	33.0	3.0	34.4	45.5	78.0						304	Broke with coarse splinters	75
6.2	11.5	17.5	25.3	1.9	25.0	33.5	48.0						345	Failed by bending; fine splinters	75
8.8	17.7	27.5	40.5	4.5	41.5	56.0	82.0						315	Specimen cross-grained; splinters on corners at knots	306
10.2	18.5	29.5	42.7	5.5	44.5	60.0	87.0						322	Broke with large splinters	306
6.5	14.0	21.5	30.0	2.5	32.0	42.0	57.5	87.0					361	Broke with large scale	306
9.0	17.3	29.0	42.0	5.7	44.0	58.8	91.6						329	Square break on tension side with coarse splinters	873
7.8	16.0	25.2	37.6	4.8	39.0	53.0	82.5						325	Broke with coarse splinters	873
6.2	12.8	20.0	28.0	2.3	29.0	37.3	51.0	74.0					380	Shattered; large, coarse splinters	1111
5.0	10.4	16.0	21.7	1.1	22.3	30.0	38.2						350	Broke at knot; coarse splinters	1111
7.3	15.0	25.0	37.0	5.3	38.0								250	Specimen cross-grained; split with grain	652
5.0	9.0	14.3	20.0	1.5	20.2	26.5	35.4	50.0	70.5				437	Specimen cross-grained; broke with large splinters	652
15.4	38.0												119	Square break	486
22.0													85	do	486
12.0													98	Specimen cross-grained; split with grain	508
4.7	9.2	14.0	20.5	1.3	20.7	28.0	40.0	55.0					400	Broke with coarse splinters	132
6.0	10.8	16.4	23.0	1.0	23.5	31.0	43.0	61.0					362	do	132
5.2	11.0	15.8	22.6	2.0	23.5	32.3	46.0						327	Broke with thin flakes	1244
6.8	12.0	18.5	26.6	2.3	27.0	38.2	57.0						315	Failed from splinters on the corner	1245
7.0	13.5	20.0	29.0	2.6	30.3	42.0							297	Failed from thin scales on tension side	1246
6.5	14.0	21.4	32.4	2.6	32.2	43.2	70.0						318	Broke with large splinters	1255
7.7	14.4	22.2	32.5	3.0	33.5	44.3							298	do	1255
5.7	10.5	15.2	20.2	0.7	20.6	27.0	31.5	38.5	47.0	56.4			474	Broke with fine splinters	253
5.2	10.2	15.2	20.4	0.4	21.0	26.4	32.0	38.5	47.8	58.0			491	do	253
12.0	23.0	38.0	55.7	9.2									200	Specimen cross-grained; split with grain	21
5.5	10.0	14.5	19.6	1.0	20.8	25.0	33.0						338	Square break with coarse splinters	126
4.3	8.2	12.3	17.0	0.6	17.5	22.6							274	do	126
7.8	15.7	24.4	36.8	3.5	38.3	63.0							250	Broke with fine splinters	686
8.2	15.6	24.6	39.0	4.9	41.0								229	Broke with thin flakes from tension side	686
12.0	23.0	38.7											200	Specimen cross-grained; split with grain	648
9.1	20.0	34.2											165	Specimen cross-grained	648
7.7	15.0	23.0											157	Specimen cross-grained; broke at small knots	16
6.4	12.4	19.0	27.5	2.0	28.0	38.2							285	Square break on tension side; split in axis	16
6.0	11.0	16.8	22.8	0.9	24.0	31.7							293	do	76
5.0	9.6	14.5	20.3	0.6	21.0	28.4							277	Crushed at center bearing; broke with long splinters	76
4.3	8.0	12.4	17.0	0.9	18.0	24.3							297	Crushed at center bearing; broke with fine splinters	76
7.0	14.0	18.5	27.0	2.0	29.0								239	Square break	123
10.0	23.0												140	do	393
6.0	12.0	17.7	24.0	1.0	24.0	31.0	40.0						349	Square break on tension side, splitting in axis; shattered	1057
5.4	9.4	14.0	19.0	0.3	19.2	24.0	29.5	35.6	44.0				439	Specimen cross-grained; shattered	112
5.4	10.0	14.8	20.4	0.6	20.5	25.5	32.3						327	do	117
5.6	10.0	15.4	21.6	1.3	21.8	29.7	42.0						310	Specimen cross-grained; long break started at small knot	149

TABLE III.—BEHAVIOR OF THE PRINCIPAL WOODS OF THE

Species.	Office number.	State.	Locality.	Collector.	Soil.	Specific gravity of the air-dried specimen.	Direction of grain.	COEFFICIENT OF ELASTICITY. First deflection.	Second deflection.	Modulus of rupture.
239. Juglans nigra—continued	318	Michigan	Lansing	W. J. Beal	Loam	0.6619		976	976	586
	325	Texas	Dallas	J. Reverchon	Alluvial	0.6455		976	930	668
	407		Charlestown Navy-yard.	S. H. Pook		0.5981		976	1136	923
	430	Tennessee	Nashville	A. Gattinger	Limestone	0.5724		857	921	898
	766	Florida	Aspalaga	A. H. Curtiss	Clay	0.6933		1221	1221	820
	766	....do	....do	....do	....do	0.6949		1627	1627	1137
	951	Texas	New Braunfels	C. Mohr	Moist, calcareous	0.7483		1221	1191	923
	951	....do	....do	....do	....do	0.7386		939	1017	937
240. Juglans rupestris *Walnut.*	415	New Mexico	Pinos Altos mountains.	E. L. Greene	Alluvial	0.6125		697	688	462
	415	....do	....do	....do	....do	0.7297		660	679	949
	672	California	Contra Costa county	G. R. Vasey	....do	0.5977		776	842	468
	672	....do	....do	....do	....do	0.6063		626	697	520
241. Carya olivæformis *Pecan. Illinois Nut.*	322	Mississippi	Greenville	C. Mohr	....do	0.7444		642	651	457
	322	....do	....do	....do	....do	0.7489		904	976	675
	326	Texas	Dallas	J. Reverchon	....do	0.7181		470	496	581
	326	....do	....do	....do	....do	0.6250		542	542	600
242. Carya alba *Shell-bark Hickory. Shag-bark Hickory.*	3	Massachusetts	Arnold Arboretum	C. S. Sargent	Drift	0.8295		1395	1356	1245
	3	....do	....do	....do	....do	0.7955		1320	1356	1249
	29[2]	Kentucky	Danville	W. M. Linney	Shale	0.9716		1163	1220	1266
	118[2]	Michigan	Hudson	W. J. Beal	Clay	0.8085		1356	1395	1057
	118[3]	....do	Lansing	....do	....do	0.8035		1575	1550	1036
	152	Missouri	Allenton	G. W. Letterman	Rich upland	0.8217		1627	1627	1132
	249	Virginia	Wytheville	H. Shriver	Clay	0.8108		1221	1191	1144
	249	....do	....do	....do	....do	0.8041		1085	1163	1160
	249	....do	....do	....do	....do	0.8163		1221	1320	1242
	531	Mississippi	Kemper's mill	C. Mohr	Alluvial	0.8895		1320	1479	1280
	531	....do	....do	....do	....do	0.8829		1356	1395	1289
	531	....do	....do	....do	....do	0.8746		1526	1601	1444
	539	....do	....do	....do	....do	0.9148		1285	1526	1242
	539	....do	....do	....do	....do	0.7698		1479	1575	1237
	816	West Virginia	Grafton	C. G. Pringle	....do	0.7569		1526	1627	1041
	816	....do	....do	....do	....do	0.7947		1628	1628	1216
	1056	Massachusetts	Topsfield	J. Robinson	Rich loam	0.8614		800	976	1137
	1056	....do	....do	....do	....do	0.8439		888	921	1073
	1097	Missouri	Allenton	G. W. Letterman	Alluvial	0.8261		1395	1502	1331
	1097	....do	....do	....do	....do	0.7522		1221	1356	1172
243. Carya sulcata *Big Shell-bark. Bottom Shell-bark.*	91	Kentucky	Mercer county	W. M. Linney	....do	0.7130		976	1062	1022
	91[2]	....do	....do	....do	....do	0.6603		729	781	755
	383	Missouri	Allenton	G. W. Letterman	....do	0.9376		751	842	1223
	383	....do	....do	....do	....do	0.9333		660	729	1055
	383	....do	....do	....do	....do	0.9421		939	1085	1160
	391	....do	....do	....do	....do	0.8886		872	957	1172
	391	....do	....do	....do	....do	0.8648		939	1007	1116
	1082	....do	....do	....do	....do	0.9000		740	849	1087
	1082	....do	....do	....do	....do	0.8834		660	835	1083
	1164	....do	....do	....do	....do	0.7927		1221	1191	1144
	1164	....do	....do	....do	....do	0.8481		1356	1526	1352
	1164	....do	....do	....do	....do	0.7762		1221	1395	1287

UNITED STATES UNDER TRANSVERSE STRAIN—Continued.

DEFLECTION, IN MILLIMETERS, UNDER A PRESSURE, IN KILOGRAMS, OF—													Ultimate strength: transverse pressure.	Remarks.	Office number.
50	100	150	200	0 (set.)	200	250	300	350	400	450	500	550			
5.0	10.0	15.0	21.6	0.6	21.7	.....	.....	.....	.....	.....	.....	.....	250	Specimen cross-grained; shattered	318
5.0	10.5	16.0	21.0	1.0	21.7	28.0	.....	.....	.....	.....	.....	.....	285	Specimen cross-grained; split at corner	325
5.0	8.6	13.0	17.5	0.2	17.7	22.7	28.5	38.0	.....	.....	.....	.....	394	Crushed at center bearing; broke in long splinters	407
5.7	10.6	16.0	22.0	0.7	23.0	28.2	37.0	49.5	.....	.....	.....	.....	383	Square break; split from end to end	430
4.0	8.0	12.6	18.0	1.2	18.7	24.0	32.0	41.6	.....	.....	.....	.....	350	Square break on tension side; split in axis	766
3.0	6.0	9.8	13.2	0.2	13.5	17.0	21.0	26.0	32.0	40 0	.....	.....	485	.....do	766
4.0	8.2	12.7	17.5	1.0	18.0	23.0	29.5	39.2	.....	.....	.....	.....	394	Specimen cross-grained	951
5.2	9.6	15.0	21.0	1.5	21.2	28.0	36.0	49.5	.....	.....	.....	.....	400	Shattered	951
7.0	14.2	23.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	197	Specimen cross-grained; broke at knot	415
7.4	14.4	21.5	29.0	2.0	29.4	38.5	50.0	68.5	112.0	.....	.....	.....	405	Failed from splinters on corners	415
6.3	11.6	17.2	24.0	1.0	.....	.....	.....	.....	.....	.....	.....	.....	200	Specimen cross-grained; broke at knot	672
7.8	14.0	21.5	30.0	1.6	31.2	.....	.....	.....	.....	.....	.....	.....	222	Cross-grained; broke with large splinters	672
7.6	15.0	23.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	195	Defective specimen; square break on tension side	322
5.4	10.0	15.7	21.4	0.9	21.6	28.0	.....	.....	.....	.....	.....	.....	288	Split; did not break	322
10.4	19.7	32.0	51.5	8.8	54.4	.....	.....	.....	.....	.....	.....	.....	248	Specimen cross-grained; square break on tension side; split in axis	326
9.0	18.0	29.3	43.0	5.3	44.0	61.0	.....	.....	.....	.....	.....	.....	256	Square break on tension side; long splinters	326
3.5	7.2	11.4	16.0	0.4	16.2	20.8	27.3	34.5	43.0	58.0	87.0	.....	531	Sap-wood; broke with fine splinters	3
3.7	7.2	10.8	14.4	0.4	14.5	18.2	23.5	30.0	37.0	50.7	75.0	.....	533	.....do	3
4.2	8.0	12.2	17.0	0.9	17.6	23.0	29.5	36.0	44.0	60.4	82.0	.....	540	Broke with fine splinters	29[2]
3.6	7.0	10.5	14.0	0.6	14.2	17.6	21.7	26.5	32.0	46.0	.....	.....	451	Broke with long flakes from tension side	118[2]
3.1	6.3	9.0	12.1	0.2	12.4	15.5	19.0	23.0	29.5	.....	.....	.....	442	Broke with long, fine splinters	118[2]
3.0	6.0	9.2	12.5	0.2	12.8	16.0	19.5	24.0	29.0	37.0	.....	.....	483	Broke with large, coarse splinters	152
4.0	8.2	13.0	18.2	1.0	19.0	25.0	33.0	43.0	56.0	76.0	.....	.....	488	Sap-wood; broke with fine splinters	249
4.5	8.4	12.7	16.8	0.6	17.3	21.5	28.5	36.6	46.0	64.0	.....	.....	495	.....do	249
4.0	7.4	11.2	15.3	0.8	15.4	19.2	25.7	33.5	45.0	57.0	84.0	.....	530	.....do	249
3.7	6.6	10.0	13.0	0.2	13.2	16.6	21.0	25.5	33.0	41.0	55.0	100.0	550	Crushed at center bearing; fine splinters	531
3.6	7.0	10.2	13.2	0.3	13.5	17.0	21.0	26.0	33.0	40.6	55.0	.....	550	.....do	531
3.2	6.1	9.0	12.0	0.3	12.2	15.3	19.0	23.5	28.4	35.0	44.5	59.0	616	Deflection of 88 millimeters under pressure of 600 kilograms; some crushing at center bearing.	531
3.8	6.4	9.6	12.5	0.3	13.0	15.8	20.2	24.0	29.5	39.0	54.0	.....	530	*Crushed at center bearing; fine splinters*	539
3.3	6.2	9.2	12.6	0.2	13.0	16.2	20.0	25.0	31.5	40.0	59.5	.....	528	0.5 sap-wood; crushed at center bearing; fine splinters	539
3.2	6.0	9.0	12.0	0.2	12.5	16.0	19.7	24.5	30.5	.....	.....	.....	444	Broke with long splinters	816
3.0	6.0	8.6	11.5	0.3	11.5	14.2	18.2	22.5	28.5	36.0	49.5	.....	519	.....do	816
6.1	10.0	14.6	20.0	0.9	20.4	26.2	35.0	45.0	58.0	81.0	.....	.....	485	Broke with fine splinters	1056
5.5	10.6	16.0	22.6	1.9	23.0	30.3	40.2	54.0	74.5	105.0	.....	.....	458	Sap-wood; broke with fine splinters	1056
3.5	6.5	9.6	12.5	0.3	13.0	16.0	20.2	25.0	30.7	38.0	49.5	71.2	568	.....do	1097
4.0	7.2	10.5	14.2	0.5	14.4	18.0	22.5	28.9	37.0	48.0	70.0	.....	500	0.5 sap-wood; broke with fine splinters	1097
5.0	9.2	14.0	18.5	0.4	19.0	24.2	30.8	41.0	55.6	.....	.....	.....	436	Broke with two large splinters on tension side	91
6.7	12.5	18.5	26.2	1.4	27.0	36.0	50.0	.....	.....	.....	.....	.....	322	Failed from thin flakes on back	91[2]
6.5	11.6	17.6	25.0	2.0	26.1	33.6	45.2	60.0	85.0	132.0	.....	.....	479	Slipped from bearings; splintered	383
7.4	13.4	21.5	30.5	3.2	31.0	40.0	53.0	78.5	102.5	194.0	.....	.....	450	Sap-wood; slipped from bearings; did not break	383
5.2	9.0	13.2	18.3	1.0	19.1	25.0	31.4	41.4	54.5	75.0	.....	.....	495	Failed from thin flakes on back	383
5.6	10.2	15.0	20.5	1.1	21.0	28.0	36.0	46.0	59.0	91.0	185.0	.....	500	Broke with fine splinters	391
5.2	9.7	14.7	20.0	1.0	20.6	26.5	34.0	43.0	61.5	84.0	.....	.....	476	0.5 sap-wood; broke with fine splinters	391
6.6	11.5	16.1	22.2	1.0	22.6	30.0	40.0	54.0	77.0	130.0	.....	.....	464	Did not break; pushed through the bearings	1082
7.4	11.7	16.0	21.3	1.1	22.0	27.5	36.0	47.0	63.0	95.0	.....	.....	462	Broke with fine splinters	1082
4.0	8.2	12.0	16.5	0.6	16.6	21.0	27.5	35.0	45.0	66.5	.....	.....	488	.....do	1164
3.6	6.4	9.5	12.8	0.4	12.7	16.0	20.0	24.5	30.3	37.0	46.0	65.0	577	.....do	1164
4.0	7.0	10.2	13.6	0.4	14.0	17.4	22.0	27.4	33.2	42.6	56.0	.....	549	.....do	1164