

party. The person who goes into forestry work thinking to idle away his time in a dilettante way, is due to receive a rude shock. Forestry is work, and really hard work, both physical and mental, and scant ceremony awaits the man who will not play up to his share in the forest organisation." As regards pay, the same conditions hold as in other professions—there are comparatively few "good jobs" or "plums" judged from the purely mercenary standard. Even the most responsible jobs on earth, such as the executive heads of vast organisations like the United States Forest Service, are underpaid when compared with positions of like responsibility in purely commercial life. But everything depends on the man himself. The young forester must be prepared to be "tried out" in subordinate jobs, and his future emolument depends entirely on how he "makes good." In forestry, more than in any other profession, there is no royal road to material success. The forester must not expect to amass a fortune in his profession; good living there may be, but no easily gained wealth. The "no thanks" part of the phrase is often true. The forest officer is constantly afflicted and irritated by the non-comprehension of and apathy toward his task, his motive, his work, and his joys and sorrows, by those around him. His finest achievement may be received with maddening complacency by the public whom he benefits, and even the people closest to him can at best admire only—they can only approximate the spirit which animates his work.

It would seem from this that forestry has little to offer her disciples—yet in spite of all that has been said there remain two distinct rewards which are bestowed upon all who truly and whole-heartedly put their lives into the work, and, though the cynic may sneer, and the man himself may not readily admit it, yet these two rewards are great enough to the soul of man to make the whole thing well worth while, so that men are content to put their lives into forestry work in all corners of the earth, enduring hardship, suffering, loneliness, exile from one's fellows, and thinking themselves well rewarded thereby.

The first of these rewards is the pleasure of work well done, the pride of accomplishment, which comes to a man when he sees the fruits of his labours taking tangible form—the forest of his charge developing as the forest of his dreams, the barren areas stocked with green, a forest industry established, providing homes for families where before was empty space, and so on, ad infinitum.

The second reward is the personal pleasure—the supreme happiness of valued association, a pleasure known to all men who have together faced hardship, danger, difficulty or stress, and have come through it strengthened and refined, and with a priceless bond be-

tween them. It is the deep friendship which was engendered on the slopes of Gallipoli, and the plains of Flanders only a few years ago, the most priceless good arising from that welter of agony. This happiness is the reward of those who enter an organisation of men banded together for the purpose of achieving a common purpose in the face of obstacles. It is the greatest reward which life has to offer, and it remains with every man who has received it until death. Even though he may leave the forestry work for other lines of effort, it will always be his most cherished remembrance.

And in conclusion, the prospective forester may be asked this question: Would he desire that his profession asked less of him than his utmost capacity of grit, both mental and physical; submission to the discipline that countless fine men before him had found necessary, apprenticeship no more burdensome than any business asks—the self-reliance of the really competent man—and open, fair and congenial competition with men who have shown their breed. Can he ask a greater reward than the personal surety of work well done—a work of value to the community—a work that will mould him as a man, and the fine associations that will go with him from the day of entry until the day when he cocks his heels up on the fireside and says to some old crony, "That was the Golden Age—there were giants then."

If he cannot sincerely answer "Yes" to these questions, then forestry has no place for him, and he will waste his time to even consider it, but if he can, and is willing to enter upon his chosen profession with singleness of heart, then the field of opportunity lies wide before him.

AN IDENTIFICATION SCHEME FOR COMMON WOODS OF NEW ZEALAND.

Introductory Note.—The key given below was compiled during the year 1925 by students of the School of Forestry, working under the guidance of Mr. Hutchinson. It is intended for general practical wood identification by rangers and timber users, and for this reason has been based upon macroscopic structure only—that is, the key is intended for use, not by the scientist with a microscope and laboratory at his disposal, but by the practical man whose only aids are a sharp pocket knife and a small pocket lens or reading glass. The wood structure was taken as the base of the key, due to the inadequacy, so well known to all timber users, of attempting to describe with certainty on paper any wood by means of superficial characteristics such as weight, hardness, colour, etc., in such terms that a person unfamiliar with the wood may recognise it from the printed description. Superficial charac-

teristics such as those mentioned vary so greatly within different pieces of the same wood, also, that no definite and accurate classification can be attempted by this method, whereas the cellular structures of woods, as revealed by close observation on a smooth, freshly-cut surface, are constant anatomical features holding good for any wood for all conditions of growth, etc., which may influence weight, hardness, colour, or other superficial character. To make for simplicity, however, while structure of the wood is the basis of classification throughout, in specific descriptions the plan has been adopted that in the event of a superficial characteristic being a positive clue to identification, that characteristic alone is listed. The key makes no claim to give a scientific description of any wood. Its purpose is merely to enable a person to distinguish one wood from another, and differences only, not resemblances or full descriptions, are listed, so that if a single feature is sufficient in itself to distinguish a wood from others for which it might be mistaken, that feature alone is listed.

In the use of this structural basis of classification it has been necessary to use a number of technical terms unfamiliar, perhaps, to the average timber user. This is unfortunate, but it is necessary, and full information with illustrations, leading to the recognition of the various wood elements, is given in any text-book on botany or wood structure.

Unless otherwise stated, all descriptions in the key are based on the end or cross-section, freshly cut with a sharp knife so as to present a smooth surface.

The key is by no means in final form as presented here. It is given place in this Journal merely to bring it before the notice of interested persons with a view to soliciting criticism leading to its improvement as regards both accuracy and simplicity, and the School of Forestry will be very glad to receive comment of this nature from persons who have given it a practical testing.

A KEY TO THE COMMON WOODS OF NEW ZEALAND, BOTH NATIVE AND EXOTIC.

BASED UPON MACROSCOPIC IDENTIFICATION.

PART I.

Non-porous Woods (Conifers). Tracheids barely visible with lens, uniform in size. Rays very fine.

A. Resin ducts present, though often not distinct without lens.

- (1) Resin ducts numerous, scattered singly, visible to the naked eye. Colour contrast between heart and sap usually sharp and distinct.

The Pines.

- (a) Moderate to little contrast in colour and density between spring wood and summer wood, transition gradual. Texture uniform, wood soft to medium, comparatively non-resinous. Colour, pale straw to reddish brown.

Soft Pines.

- (b) Decided contrast in density and usually in colour between seasonal growths. Transition

abrupt. Texture variable from very hard to soft. Moderate to highly resinous. Colour variable, but usually darker than the soft pines.

Hard Pines.

- (2) Resin ducts mostly small, few, inconspicuous, scattered singly or in tangential groups of 2-20, usually invisible without lens.

- (a) Heart decidedly darker than sap. Wood moderately heavy.

- (i) Heart yellow to orange red. **Douglas Fir.**

- (ii) Wood variable, but mostly hard and heavy. Decided contrast between seasonal growths. Sap wood thin, distinct demarcation, sap white, heart red. **Larch.**

- (b) Heart same colour as sap or nearly so; heart not clearly defined. Wood moderate to very light and soft. Slight to decided seasonal growth contrast. Non-resinous, fine texture, satiny lustre finely dappled, especially the tangential surface. **Spruce.**

B. Resin ducts normally absent (may be present due to injury).

- (1) Woods with aromatic odour, mostly light and soft.

The Cedars.

- (a) Colour light clear yellow and slightly brownish.

Yellow Cedars.

- (i) Odour mild but powerful, like camphor. Wood with waxy feel and lustre. Moderately hard and heavy. **Cedrus (atlantica).**

- (ii) Wood light and soft. Odour pungent. Taste unpleasantly spicy-resinous.

- (a) Colour very light, texture very fine. Odour mild, unpleasant.

Ch. nootkatensis.

- (b) Colour deep yellow, sometimes brownish. Texture very fine. Odour very pungent.

Ch. lawsoniana.

- (c) Colour pale yellow texture, fine, odour faint. **L. decurrens (N.Z.)**

- (b) Colour varying from light brown to purple, never yellow

Red Cedars.

- (i) Wood moderately hard and heavy.

Cu. macrocarpa (N.Z.).

- (ii) Woods moderately to distinctly light and soft.

- (a) Wood moderately light and soft, seasonal growth transition slight; colour light red. **Kawaka.**

- (b) Woods distinctly light and soft. Decided contrast. Late wood thin but hard; early wood very soft.

1. Seasonal growth transition abrupt.

Western Red.

Cedar (Th. plicata).

2. Difference in density between late and early wood slight; pinkish flush.

Cupressus torulosa.

- (2) Woods without aromatic odour.

- (a) Woods light and soft.

- (i) Colour white.

Kahikatea.

- (ii) Colour clear waxy yellow (heartwood), sapwood white. **Mountain Silver Pine.**

(Yellow Pine).

- (iii) Colour red. Growth rings distinct. Late wood thin but hard. **Redwood.**

- (b) Woods moderately to quite hard and heavy.

- (i) Colour light cream, sometimes with bluish or pinkish tinge. Growth rings distinct (dentate), wood moderately hard and heavy. **Tanekaha.**

- (ii) Colour yellow.

- (a) Wood moderately light and soft, fine texture. Flecked on radial and tangential section with distinctive dapple. **Kauri.**

- (b) Darkish tinge, moderately light and soft. Lacking distinctive dapple on tangential surface, dapple distinct on radial surface.

Monkey Puzzle.

- (c) Wood dense, hard and heavy. Colour from light fawn to full orange. Texture rather harsh. **Matai.**
- (d) Wood light clear yellow, moderately hard and heavy texture, very fine and even. Rather waxy feel and lustre. Burns with characteristic smell of turpentine. **Silver Pine.**
- (iii) Colour red to brown.
- (a) Growth rings very distinct. **Totara.**
- (b) Growth rings distinct; wood quite hard and heavy. Pinkish tinge in heartwood. **Yew (N.Z.).**
- (c) Flushed on longitudinal surface; no dapple markings. **Rimu.**
- (d) Distinct but fine dapple markings on tangential surface. **Miro.**

PART II.

Porous Woods. Hardwoods. Woods with pores conspicuously larger than the surrounding cells. Wood comparatively heterogenous. Resin ducts absent, though gum ducts are found in a few species. Rays vary from minute to conspicuous.

I. Ring-porous Woods. The pores at the beginning of each ring comparatively large, forming a distinct ring, decreasing in size abruptly toward the summer wood.

A. Rays strikingly prominent.

1. Colour pink to brown, rays enormous in breadth, fusiform, very prominent in all sections. Apparent growth rings caused by alternating tangential bands of parenchyma, very fine, but readily visible to unaided eye. **Rewarewa.**
2. Colour pale brown. Rays of great height, parenchyma in radial bands easily visible without lens. **Oaks.**
- (a) Pores in summer wood very small, and numerous. Pores in spring wood densely filled with tyloses. **White Oaks.**
- (b) Pores in summer wood larger, few; no tyloses. **Black Oaks.**

B. Rays not strikingly prominent.

1. Parenchyma in characteristic waxy tangential bands. Rays visible without lens. **Elm.**
2. Pores in late wood few; solitary or subdivided radially into 2-4, woods odourless and tasteless.
- (a) Parenchyma about pores in late wood extending winglike from them, may be confluent in irregular tangential or concentric lines. Parenchyma also terminal. Pores in late wood are much smaller than in spring-wood, the latter in a broad zone 3-10 pores wide. Rays scarcely distinct without lens. **Ash.**
- (b) Parenchyma in numerous fine concentric lines, independent of the pores. Pores in late wood approaching in size those of the early wood, which are not abundant, and are arranged in a very irregular zone.
- (i) Ripple-marks absent. Parenchyma lines as distinct as rays, visible without lens. Pores partly or wholly closed with tyloses. Colour, heart brown, sap white, with pink tinge or reddish streaks. Rays irregularly disposed, not uniform. **Hickory.**
3. Pores in early wood large and numerous. Pores in late wood arranged in groups of 2-4, generally tangentially. Parenchyma in short wavy tangential bands. Colour yellow-green to brown. **Kowhai.**
4. Pores large, few; tyloses present; colour dark brown; wood decidedly heavy and hard. **Teak**

II. Diffuse Porous Woods. Pores fairly uniform in size and distribution throughout growth rings. Occasionally more numerous and very often somewhat larger in early wood, but without forming a distinct band or ring.

A. Pores readily visible to naked eye.

1. Rays fine but visible without lens.
- (a) Woods moderately hard and heavy.
- (i) Colour brown. **Puriri.**
- (ii) Colour yellow. **Yellow-Wood.**
- (b) Woods light and soft.
- (i) Colour light brown. **Mangeao.**
- (ii) Colour light reddish brown. **Mahogany.**

2. Rays not visible.

- (a) Woods distinctly hard and heavy.
- (i) Colour dark red. Growth rings indistinct, pores small and evenly distributed. Heaviness and hardness a marked characteristic. **Bata.**
- (ii) Colour light red; pores in radial lines and densely filled with tyloses. **Red Gum.**
- (iii) Colour brownish red; pores smaller and in radial groups. Tyloses present. **Jarra.**

(b) Woods moderately hard and heavy.

- (i) Colour dark brown to purple. Pores in spring wood more numerous than in late wood. Tyloses present. Growth rings distinct. **Black Walnut.**
- (ii) Colour light reddish brown, lustrous. Rays red on cross section, pores arranged singly. Tyloses present. Flecked on longitudinal surfaces. Growth rings distinct. **Australian Cedar.**
- (iii) Colour pinkish brown. No lustre. Pores very large and conspicuous; tyloses present. Growth rings indistinct without lens. **Queensland Maple.**
- (iv) Colour very light brown, pores small; arranged in radial groups of 2 to 3. Growth rings distinct. **Australian Wattle.**
- (v) Colour light brown with pinkish tinge. Tyloses present. Growth rings indistinct without lens. Pores in radial groups of 2 to 3. **Taraire.**

B. Pores not easily discernible without lens.

1. Woods extremely hard and heavy.

- (a) Growth rings plainly visible. Parenchyma in short radial lines. Colour chocolate brown. Characteristically hard and heavy. **Maire (black).**
- (b) Growth rings distinct, parenchyma not visible. Colour reddish brown. **Manuka.**

2. Woods moderately hard and dense.

- (a) Woods with bluish or pinkish tinge. Rays quite distinct.
- (i) Rays distinct on cross section.
- (1) Rays lighter than background. Apparent growth rings very distinct as tangential bands of white parenchyma on dark yellow to brown background and embracing majority of pores. **Karaka.**
- (2) Rays darker than background, plainly visible on all sections. Wood firm and close textured. **Holly.**
- (ii) Rays not distinct on cross section, but very prominent on radial section as broad bars of distinctly redder or browner colour. **Tawa**
- (b) Woods yellow or light brown, but not reddish.
- (i) Pores minute; difficult to see with lens. **White Maire.**
- (ii) Pores distinct with lens, partly visible without.

- (1) Apparent growth rings visible on cross section, vessel lines plainly visible on longitudinal surfaces. **Mangeao.**
- (2) No apparent growth rings visible to unaided eye. Structure close and tough, inclined to wavy grain. Vessel lines not easily visible. **Hinau.**
- (c) Woods with distinct reddish tinge.
- (i) Growth rings distinctly visible.
- (1) Rays very prominent **English Beech.**
- (2) Rays fine.
- (i) Wood light red or white with distinct reddish flush, quite hard and even textured. **Birch (alba)**
(**English or American**).
- (ii) Woods distinctly red or red-brown. **N.Z. Beeches.**
- ii. Growth rings not distinct.
- (i) Parenchyma prominent to unaided eye on cross section, resembling growth rings, but with lens apparent as numerous, very often merging, concentric lines frequently partly embracing the pores. **Kohekohe.**
- (ii) Parenchyma not prominent on cross section. Woods, dull red.
- (a) Wood noticeably light and soft textured. **Kamarahou.**
- (b) Wood noticeably heavy and close textured. **Kamahi.**
- (3) Woods distinctly light and soft.
- (a) Growth rings apparent to unaided eye.
- (i) Colour red brown. Lustre dull. Texture coarse. Pores very abundant, readily visible to naked eye. Wood fairly tough. **Willow.**
- (ii) Coarse woolly texture. Lustre dull, pores abundant and visible without lens. **Poplars.**
- (iii). Wood very fine texture, pores minute, invisible without lens; very uniform. Colour pale yellow or nearly white. Lustrous. Growth rings terminated by fine line of parenchyma. Wood tough, often with interlocked grain. **Horse chestnut.**
- (b) Growth rings not apparent to unaided eye.
- (i) Wood light brown; soft, but tough and elastic. **Pukatea.**
- (ii) Wood white (clean white to dirty white). Rays prominent, lighter than background. **Mahoe.**
- NOTES—(N.Z.) after name of wood indicates key specimens were of New Zealand grown, not imported, timber.

CLUB AND SCHOOL JOTTINGS.

The Forestry Club.

The need of some sort of bond between the students of the new school was felt early in the session, and it was therefore decided to organise a club or other body to serve both as a means of providing some social amenities for students and staff, and to advance the aims and ideals of the forestry profession.

At a special meeting of the staff and of all students enrolled in the School, called by the Lecturer in Charge on the 24th June, 1925, at Canterbury College, formal effect was given to this decision by the formation of the Forestry Club of the Canterbury College School of Forestry—a body consisting of the staff of the

School and of all students taking courses in the School of Forestry, and open at all its meetings to practising foresters, students in forestry at other institutions, and persons interested in forestry generally.

At the first meeting of the Club, the first of its kind in New Zealand, officers for the year 1925 were elected, and the necessary machinery for orderly conduct of the meetings was provided for. Bearing in mind the dual purpose of the club, that it serve as a means of promoting good-fellowship among the students, and that it serve as a medium for furthering the scope of the profession, it was decided that at each meeting there be presented a prepared paper by some member of the Club, or by arrangement, by some forester of recognised attainment, dealing with some aspect of forestry or associated topic, and that, following the business of the evening, the meeting be declared social, to be concluded with light refreshments and "smokes" provided for from the Club treasury.

For the initial year, meetings once a month were considered advisable, though since the club has in the past year so clearly proved its value, and as membership will no doubt be greatly increased in the next year or two, it is very probable that fortnightly meetings will hereafter be the rule.

A written constitution was, in view of the compactness of the Club, deemed unnecessary for the present, and all formality has been dispensed with as far as possible, so as to make for as free an interchange of ideas as possible.

Those present at this initial meeting of the Club were:—Messrs. Foweraker and Hutchinson, staff, and Messrs. Barker, Clark, Hamilton, Kingan, Roche and Skipworth, students. Officers for the 1925 session were:—President, Mr. Foweraker; Vice-president, Mr. Hutchinson; Secretary-Treasurer, Mr. Clark—these officers, together with Mr. Kingan, forming the Executive Committee.

Four ordinary meetings of the Club were held during the remainder of the scholastic year. At the meeting on 15th July, Mr. Hutchinson gave a paper dealing with the "Manufacture of Newsprint Paper in Canada," Part I. dealing with the bush end of the operation only, the succeeding part dealing with actual manufacture being held over until some future time. Mr. Hutchinson detailed the preliminary exploratory reconnaissance carried on in the depth of winter by means of snowshoes, dog-teams and toboggans on the Hudson Bay watershed of Northern Ontario with a description of the country, class of bush, etc., the taking up of a timber "limit," establishment of the pulp and paper mill, the cruising of the "limit" and the laying out of the plan of logging operation, the methods of felling, hauling, and transport to the mill, and the work of the Forestry Department in the securing of