ART. LXXII.—*Kahikatea as a Building Timber.*

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IN a paper read before this Institute by Mr. E. Bartley, on "The Building Timbers of Auckland," and printed in the last volume of "Transactions," a somewhat one-sided reference is made to kahikatea, and a very low estimate of its value as a building timber is given. As I have had during the past fifteen years excellent opportunities of observing the capabilities of the kahikatea of the Thames Valley, I propose placing before you such facts as will, I believe, give a more just appreciation of its merits.

The kahikatea of the Thames grows upon low-lying, wet ground, but whether it is better or worse than that which grows upon high and dry land, I am not in a position to say, as I have had no experience of the latter. I may here state that I have not been able to obtain any satisfactory reasons for supposing that there is any material difference in the two kinds, or that that growing on dry ground is any more durable than that which is found in the swamps. There are two marked features noticeable in kahikatea trees, as will be seen from the sections of two trees which I have here. The one is quite white all through, while the other shows very plainly the yellow heart, and the outer white, or sap part. The heart is much harder, and contains seams of gum near the centre. In the Thames forests the latter kind is by far the most abundant, the white kind being comparatively rare. The heart in kahikatea is proportionately much less than in kauri, totara, or rimu, and is irregular in form. Logs newly felled are so heavy that many of them barely float, and about 10 per cent. will sink; but, when cut into boards, and dried, the timber is reduced in weight fully 30 per cent. Sawn kahikatea presents a nice appearance. It is clean, and generally straight-grained, and, when dressed and polished, looks well in ceilings and for other indoor purposes. It takes a greater strain to break it than kauri, and does not shrink endways. Apart from the question of its durability, it is otherwise equal to any of our other timbers used for building purposes.

It is, however, more particularly to its durability that I desire to call attention, knowing that this is one of the first requisites of a building timber. For eighteen years the kahikatea of the Thames has been used in considerable quantities in building, but before the first sawmill was started several houses were built of kahikatea, sawn by hand. One of these houses is situated at Te Puke, and was built in 1850 by the late Mr. Thorpe, one of the first European residents of Ohinemuri. I

have here a piece of board taken from the original building, which is in a good state of preservation. Here, also, is a section cut from the wall of one of the first seven cottages built at Turua, where the first steam sawmill on the Thames River was erected in 1868. It shows a portion of the ground plate, studs, braces, and weather-boards. You will notice that the stud has the bark on one corner, showing that it is sap-wood. These houses are eighteen years old, and the specimen I show is a fair representation of the state of preservation in which they all are. It has never had a coat of paint; in fact, only one of these houses has been painted, and the only parts which have been renewed are the verandahs and the heart of kauri shingles which covered them. I show you, also, a split kahikatea shingle taken from the roof of a house erected in 1872, which has stood the weather for fourteen years, the average life of heart of kauri shingles.

I could produce numerous other instances, from buildings at the Thames and elsewhere, of the weather-enduring qualities of Thames kahikatea; but these are shown as cases of severe trial, and I claim that the record will compare favourably with that of any other of our local building timbers under like conditions. I know that cases have been recorded where portions of buildings have gone to decay in four or five years, and I do not doubt the truth of the statement; but what does that prove?

I have here a piece of 9in. x 4in. heart of kauri joist, and a piece of flooring of the same timber, which were taken from the floor of a room in one of the public buildings in Auckland. This floor had only been laid six years, but it was so completely rotten that it had to be entirely renewed. I could cite other similar instances which have come under my notice; but would they prove that heart of kauri is almost worthless, when used for joists or flooring? Certainly not. I doubt if even kahikatea could have lasted any longer under the same conditions. Investigation into the circumstances will show that it would be absurd to suppose that any timber would have lasted long in such a place, being exposed to the dampness of the ground, which was within a few inches, and so completely enclosed that there was not the slightest chance of ventilation.

This is but one instance of the unfair treatment which our timbers are constantly receiving at the hands of sawmillers, architects, and builders. The logs are cut up at the mills, and, before the boards have had, in many cases, even a week to dry, they are hurried into their places in the building, painted, or papered, just because the contractor has only a few weeks to complete the work, or he will incur pains and penalties. Imagine the close, musty, fusty atmosphere the timber in the walls of such a house is subjected to, and say if it is any wonder it rots, or that fungoid growths and boring beetles are developed.

The use of unseasoned timber for building purposes is one of the most fruitful sources of decay. This is especially the case where kahikatea is used. It should be thoroughly dry before being used, and protected from dampness after the building is erected. The logs should not be allowed to lie long after being felled before they are sawn, and when sawn the timber should be carefully stacked and filletted for drying. To allow the logs to lie in the bush for any length of time, or the boards to be stacked close together in a heap, is certain, to my mind, to develope those germs which afterwards bring forth fruit in premature decay, or the successful attack of the larvæ of a small boring beetle.

It is in the liability to attack from this pest that the chief objection to kahikatea lies. I have had but few opportunities of noticing the habits of these insects, or of arriving at satisfactory conclusions as to the circumstances which favour their attack. I consider, however, the heart less liable to attack than the sap, and some pieces seem much more enticing than others of the same class. I noticed in an old building at Shortland, which was being pulled down last week, that one stud was completely destroyed, while only a few of the others had been touched. The weatherboards were quite sound and good, although the house was one of the oldest, and had but little care. Dampness and seclusion, if not necessary, are certainly favourable conditions for their operations.

The plan of building so general here is well calculated to assist these insects in their work. There is the strictest seclusion in the space between the weather-boards and the lining, while the latter is papered over, thus affording the utmost security to carry on the work of destruction. I prefer, where kahikatea is used for lining, that dressed timber should be employed; paper being unnecessary, the lining will not be so readily attacked. In Canterbury and Otago, where kahikatea is more used than in any other part of New Zealand, the dressed half-inch lining is sold in large quantities; while in Queensland, which now buys a large quantity of kahikatea, the wooden houses are generally built with single walls, the weather-boards being of the kind known as "rustic," and dressed and beaded on the inside. The frame-work is also dressed, and the partitions are of inch boards, planed, tongued and grooved, and beaded on both sides. This is done so that no harbour will be afforded for the white ant, and other noxious insects which abound there. I think a building so constructed would enjoy perfect immunity from the attack of what I may here call the kahikatea beetle; but as our climate necessitates houses with double walls, the obligation is laid upon us of discovering some simple yet certain remedy for this evil. I shall be glad of assistance from gentlemen of scientific and practical skill in this

work, which, considering the extent of our kahikatea forests, is worthy of earnest attention.

Until this discovery has been made, let me urge every person about to build with kahikatea to use only seasoned timber; and here I would say that it takes a much longer time to season timber than most people suppose. Under the most favourable circumstances I do not consider that timber should be used until it has had six months' drying. Do not be in too great a hurry to paint a new house. Great injury is often done to timber by painting it before it is even half-dry. I consider, unless the timber is quite dry, that a building should have six months' exposure to the weather before it is painted.

I have used kahikatea for such purposes as fencing, planking bridges, and furniture, with good result. For fencing and planking the heart only should be used. I have several articles of furniture which are, so far as I can judge, as good, and likely to be as durable, as if they had been made of any other timber in the country.

In conclusion, while I have no desire to place too high a value upon kahikatea, I am anxious that it should take rank in accordance with its merits; and as it is a fact that those districts which have used it the most, and for the longest time, still continue to use it in preference to second-class kauri at the same price, I think it is entitled to take rank before the latter. In this opinion I know that some of the most experienced builders of Auckland, and I believe all at the Thames, concur. The rapidity with which our kauri forests are disappearing will ere long compel those who now affect to despise kahikatea to turn their attention to it as a substitute; and when, by the aid of science and experience, we are able to shield it from the attack of the aforesaid beetle, I feel convinced that it will prove itself no unworthy successor of that illustrious inhabitant of our Auckland forests.