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# ABOUT TREES, SHRUBS, AND CLIMBING PLANTS FOR SOUTH AFRICA.

CONCISE HINTS ON THE MAKING OF FARM  
PLANTATIONS, SHRUBBERIES, &c.; WITH  
DESCRIPTIONS OF TREES AND OTHER PLANTS  
SUITABLE FOR ECONOMIC USE, AND PICTORIAL  
EFFECT

*By*

GEO. CARTER, F.R.H.S.

Second Edition. Price 3/0.

*FULLY ILLUSTRATED.*

GEO. CARTER & CO. Nurserymen and Seedsmen, MARITZBURG.

AND

THE SPECIALTY PRESS OF SOUTH AFRICA LTD.,

Box 3958 JOHANNESBURG. Box 388 CAPE TOWN.

1919



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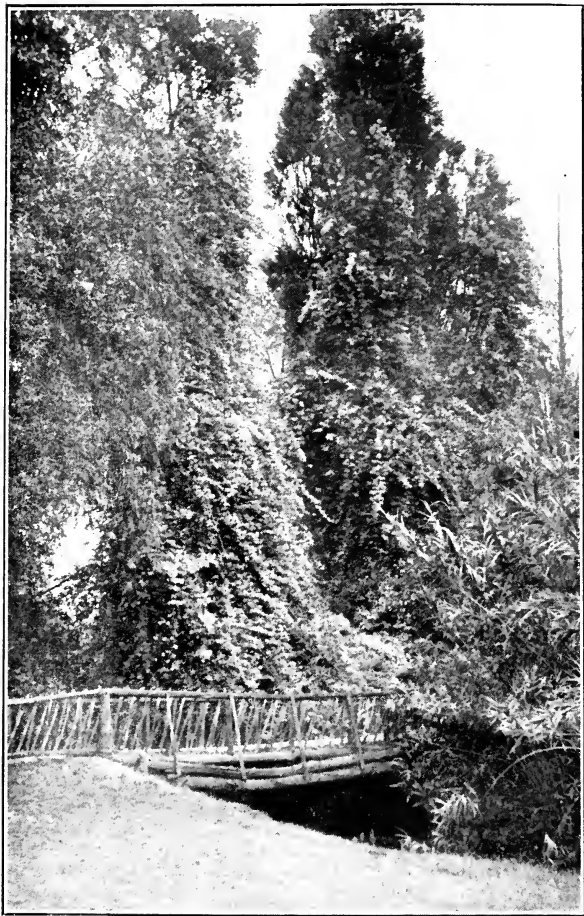
Constance Ward  
Yoch Collection

Florence Yoch

Dec 1921







A Rustic Bridge in Botanic Gardens, Maritzburg. The vigorous plant climbing the trees is *Hongivillia glabra*.

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## Foreword.

SOUTH AFRICA is very young. Experience in Arboriculture and Horticulture is accumulating but slowly. For many years yet our local experiences and temporary results will be subject to keen criticism. What is really practical work in one district may be quite impracticable in another, so varied are our climatic and other conditions. It is quite wrong to state dogmatically that *any* plant will not do well in South Africa, even although such plant has failed in a particular position over a series of years. We don't know enough to enable us to dogmatize in any way.

So that one hesitates about publishing anything, knowing that additions to our knowledge will soon cause the publication to be out of date. But a beginning must be made, although it may be imperfect and very subject to criticism and speedy revision. South Africa (and particularly the three Eastern Provinces) is hungry for trees and shrubs, and our small contribution to general knowledge will help some of our people to increase the comfort of our homesteads and improve the present bare appearance of our otherwise fine and fertile land.

Some few botanic names have been retained which are not quite correct, to avoid any confusion in the reader's mind.

We acknowledge our great indebtedness, in compiling this booklet, to F. J. Stayner, Esq., F.L.S., for his kind oversight, and many suggestions of value, to Mr. T. R. Sim's valuable "Tree planting in Natal" to Mrs. Geekie, of Benvie, and to the Curator of the Botanic Gardens here, for their kind permission to reproduce photographs of trees, &c.

We have used actual photographs of South African grown plants by way of illustration. Our readers want to know what can be done *here*, and these pictures of what *has* been done will encourage them to create like beauty spots.

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## Introduction.

TREE planting divides itself naturally into two very distinct sections. One is the *utility section*, including the planting of timber trees in forest form for the various uses to which large timber is put; the planting of trees in the same form for mine-props, firewood, fence posts, rails, &c., for which younger and smaller trees are suitable; the planting of narrow shelter-belts, or windbreaks, to prevent damage to crops from strong and cold winds as shelter for stock from the same cold winds; and planting groves in pasture land for both shelter from sun and wind.

The second section may be called the *Ornamental section*. In this the idea of utility is abandoned, and the object is to plant trees, shrubs, climbing plants and perhaps the larger grasses, in such positions and aspects as will beautify the home, or increase the beauty of the landscape picture.

The species of trees used may be useful, in some instances, for both purposes, but the method of planting will differ greatly. Pine trees, for instance, if intended for timber production, will be planted at a distance apart of four feet or so, the object being to cause the trees to drop their lower branches at an early stage, and thus prevent the formation of an undue number of knots in the cut planks. But if these trees are intended to be ornamental, the first rule to observe is to give them plenty of room, twenty or thirty feet, or even more with some species, between the plants. The effect desired in this case is to *preserve intact* all the lower branches, and allow them to sweep down to the grass or gravel.

When we think of planting trees, then, we must decide whether we want them for ornament and pleasure, or for utilitarian purposes. We shall deal, first, with *utility trees*, and then follow on with ornamental types.



## Section I.

### CHAPTER I.

#### UTILITY TREES.

WHILE there is an element of beauty always present in a timber forest, the object in planting them is not beauty but *usefulness*, or a *cash return*. Sentiment, therefore, must be put on one side, and we must decide to plant only such types, and to plant them in such a manner as is most calculated to give the best ultimate return. All farmers should be particularly interested in this work, for the uses for timber on a farm are almost innumerable. Let us run over a few of these uses first of all! What does a farmer need? He needs:

**FIREWOOD**, and that in very large quantities, both for his own use and for the use of his servants. We have seen many a farm where the only fuel available is *Cow-dung*, and yet these farms possessed every facility for the growth of many kinds of wood. We have wondered greatly how anyone could be contented to get along with such poor fuel, when the production of excellent wood only involved the purchase of some Wattle seed and a few hours spent in land preparation and sowing.

**POLES**.—In close proximity to the coast it may sometimes seem advisable to purchase iron standards and use these in preference to wooden posts. But the further inland one gets the more expensive these become, until it is greater economy to use wood posts, *grown on the farm*. And the posts are there when wanted—it may take several weeks to obtain standards. There are a hundred and one uses for *rails* about a farm. A dissel-boom breaks and can be replaced immediately. The dipping tank needs railing round. A calf pen is wanted. The cattle sheds need milking divisions. The pig-yard wants new rails—one could go on almost indefinitely, so many are the uses for poles.

**WATER CONSERVATION**.—We are well aware that this subject is controversial, and do not intend to say, as many do, that Gum trees or Wattle trees will conserve water. But anyone who has studied the subject knows that there *are* trees which *do conserve water*. These are such trees as Pines, Cypressess, Callitris, &c., the needles from which act like a sponge in absorbing the rainfall. A bare hillside allows nearly all the rainfall to race away at once into the streams. An accumulation of half rotten

foliage absorbs great quantities, and then allows it to gradually percolate into the streams and springs. It will be obvious that definite types of trees should be chosen and planted where the object is the conservation of rainfall.

SHELTER BELTS OR GROUPS will be dealt with in a separate chapter.

BARK PRODUCTION.—The production of Wattle bark for Oversea markets is now a common by-product on many farms. A separate chapter will be devoted to this subject.

MINE-PROPS.—This again is well within the scope of farmers who live within a reasonable distance of a railway line, and we are surprised that it has not yet been taken up seriously. It is a most profitable venture, much more so than Wattle growing. We will deal with the subject separately.

OTHER USES.—The production of large timber for such purposes as heavy building timber, deals, furniture wood, wagon wood, and railway sleepers is not a subject for this handbook. The period required for the growth of such timber is a long one, varying from thirty to a hundred years, and it seems reasonable to look upon the work as belonging to the State rather than to the individual.

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## CHAPTER II.

### AREAS SUITABLE FOR TREES.

THE investigations and experiments of the Forestry Department have already resulted in some definite pronouncement as to the varieties of trees suitable for different districts and localities. All this information is readily available from the District Forest officers. Experiments have been made in all the Provinces, and under many conditions of climate and soil, and one of the results is to prove that *some* kinds of trees will grow everywhere, with the exception of absolutely rainless desert regions. But the *natural forest area* is very distinctly indicated by the growth of indigenous "bush," or forest, which is limited by aspect, rainfall, humidity, &c. This forest area may be roughly defined as extending from Zululand in the North to Knysna in the South, with the Indian Ocean as an Eastern boundary, and the Drakensberg as a Western boundary. Within this area there are hundreds of square miles of land scarcely better suited for timber growth than the Kalahari desert—hot thorn-valleys with small rainfall and unsuitable soils. But, on the other hand, the South and East slopes, and particularly those which are within

the Eastern mist belt, are admirably suited for many types of trees. In such aspects and positions the Natural "bush" flourishes. There we find the best results with all trees, and the range of varieties which it is possible to grow successfully is very large indeed.

Unfortunately such conditions do not exist in the Transvaal or Orange Free State, nor even in some districts of Natal, East Griqualand, and Pondoland. Humidity decreases as Continental conditions are reached. Winter mists are unknown. The rainfall may be as low as 10 or 15 inches per annum. The range of varieties which will grow fairly successfully may become very limited, until only some kinds of Gums, Casuarinas, Callitris, Cypresses, and Pepper trees are available. Within such areas a careful study must be made to find out what varieties are suitable and likely to be successful. The one most likely to understand this point is your Forest Officer, whose business it is to accumulate and disseminate information on just such points as these. He will be glad to be of any service to enquirers. We, in this booklet, may be able to indicate generally what types are suitable for dry or moist climates, cold or warm districts; but *the man on the spot* who has made a special study of his district should be utilised wherever possible.

Where there is a choice of aspect, choose one facing South, or South-East. Where there is a choice of soils, choose the deep red slopes which are the result of decomposition of the igneous rocks. A fairly steep slope need not be feared, so long as a hillside plough will work.\* It is a great economic blunder to plant trees, in forest form, on lands which will grow good crops of Maize or other farm crops, for no timber proposition is likely to make as good a return as Maize, or Oats, or Wheat. The place for timber (except in the case of shelter belts) is in the hills. The trees do the best there, and such land can be best spared for this purpose.

It is not necessary to look for *rich* soil for trees. The important points are *depth, texture, good drainage, and aspect*. A good humus surface such as is left by the inturning of the veld-sod, will doubtless be of great assistance to the young trees during the first few months, but after that critical period the essentials are just those mentioned above—depth, aspect, good drainage, and texture of soil and subsoil.

Before deciding upon the planting of any particular area you must satisfy yourself about the nature of the subsoil. Under some of the most enticing areas there exist broad beds of "Ooklip" or Ironstone, or broad slabs of sandstone perhaps. This is not tree-land. A wise plan is to sink a few pits about four feet deep, at interval of a hundred yards or so, and examine the subsoil in these. If at such a depth the soil persists, or even

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\*Ridging along the contour is often done where the hillside plough will not work. Such land should be left very rough, and worked in strips only, to prevent washaways.

if the rock encountered is boulders, or rotten shale, tree planting will be safe. But if solid rock or any impermeable substance such as hard shale is found a foot down, it may be taken as a clear warning away from this area as a *Commercial* proposition.

This does not mean that because your farm is underlaid with shale, or freestone, you cannot grow trees; but only that you are debarred from growing them on a Commercial scale. There will always be small areas—bits of alluvial and hillside pockets—where plenty of timber for home use may be grown. Some trees there are with root systems of great penetrative and disintegrating power, such as *Callitris*, *Pinus pinaster*, *Eucalyptus sideroxylon*, and even common Wattle; and while these may not be so much at home as to make handsome specimens, they will easily reach utility size, and be well worth planting.

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### CHAPTER III.

#### PREPARATION OF LAND.

THE farmer should already know how to prepare land for trees—but most farmers don't know. Travelling about the country as we do from time to time, we see much lamentable failure in the trees. Some of this failure is caused by grass fires which have been allowed to burn into the plantations; some by irregular and unequal planting; others by cattle depredation. But most failures were there right from the planting time, and are directly traceable to ignorant or careless preparation of the land. A curious feature is that one often sees this on otherwise very well worked farms.

A plantation, or a windbreak, or a shrubbery even, is first of all a conception in a man's mind. A part of the conception is that of *value*. If one is convinced that a well-grown plantation will yield a fortune he is willing from the beginning to put solid work into it. If, on the other hand, he undervalues the plantation; if *only* a bit of firewood is to be the result, the work is done carelessly and the plantation becomes an eyesore to all passers-by. Incidentally, time is wasted. But the farmer must grasp the truth that trees are just as great a value on his farm as a field of Mealies, and that they are worth spending time and energy over. Once the conception reaches its true valuation the plantation is an assured success.

*Land intended for trees (even for Wattles) should be ploughed well to a depth of at least seven inches. During the first two or three years of their growth all trees are very sensitive to sur-*



face conditions. Deep ploughing and cultivation before planting means an accumulation of rainfall which will enable the young tree not only to live, but to continue growing and root-making right through the long dry winter. Shallow, three-inch ploughing means a hard impermeable pan just at that depth, and the whole root area as dry as a bone during the first and succeeding winters. The young tree may possibly live, but growth stops, the bark becomes bound, a stunted, gnarled specimen is produced which may or may not recover when the roots, in a sheer struggle for life, have managed to penetrate the hard pan in the search for moisture. At the best, *two years of growth is lost for ever.*

Plough deeply then, in the Summer or Autumn preceding the planting year. Break down the furrows roughly before winter with a heavy disk harrow. The Winter will then get in and continue the breaking down process, sweetening and aerating the soil. At the first Spring rain cross-plough and harrow down to as fine a tilth as you give your Maize fields, and the land is at last fit for planting.

Now is the time to fence, just before planting—not just after. We have said just now that some of the failures in tree growing were caused by the depredations of cattle. Goats are particularly destructive to young trees, but nearly all domestic animals will destroy trees either by eating the young twigs, or by breaking and trampling them down. The trees will need protection for five or six years. It is worth while erecting a strong fence at once, with the lower strands close enough to keep out the smaller animals.

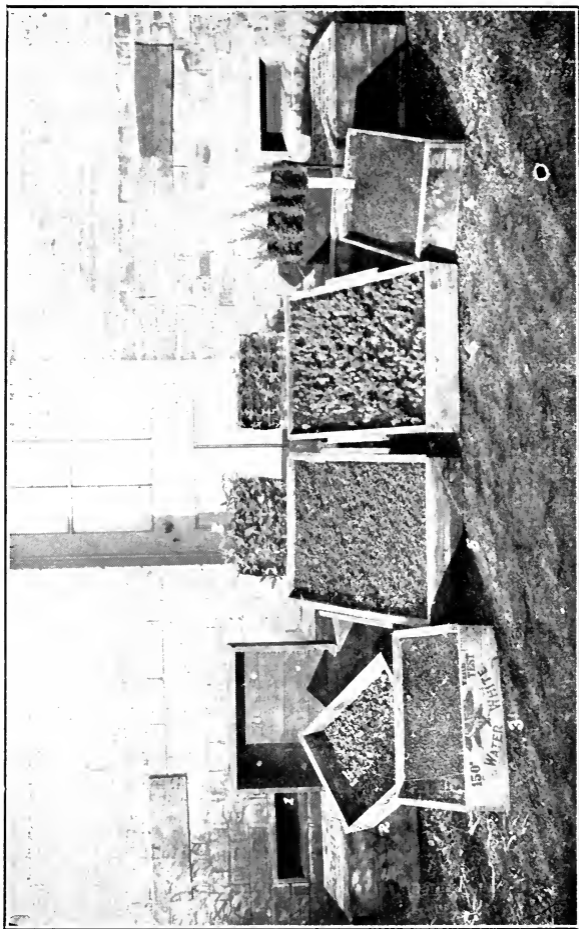
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#### CHAPTER IV.

### SEED SOWING.

WE must now go back to the Autumn preceding the planting time, for while all the land preparation is going on our young trees should be getting ready for transplanting from the Nursery tins.

Perhaps the growing of the young trees from seed is the greatest aversion to the farmer who wants to have a good plantation. It is small, tricky work, requiring a lot of care and patience. It is not "in his line" at all. Wherever possible he prefers to send along to his Nurseryman and buy the seedlings all ready for planting out. Where this is possible it is by far the best plan for many reasons. It is doubtful whether any farmer can grow the transplants at as small a cost as the Nurseryman sells them at, for the latter has every possible convenience,



(1) The seed box. (2) The seed box with drainage. (3) Ready for sowing. (4) Seed in, covered and labelled. (5) Seedlings just up. (6) Ready for pricking out. (7) Pricked out in 2 1/8" or 3 0/8" (S-S) Ready for the field.

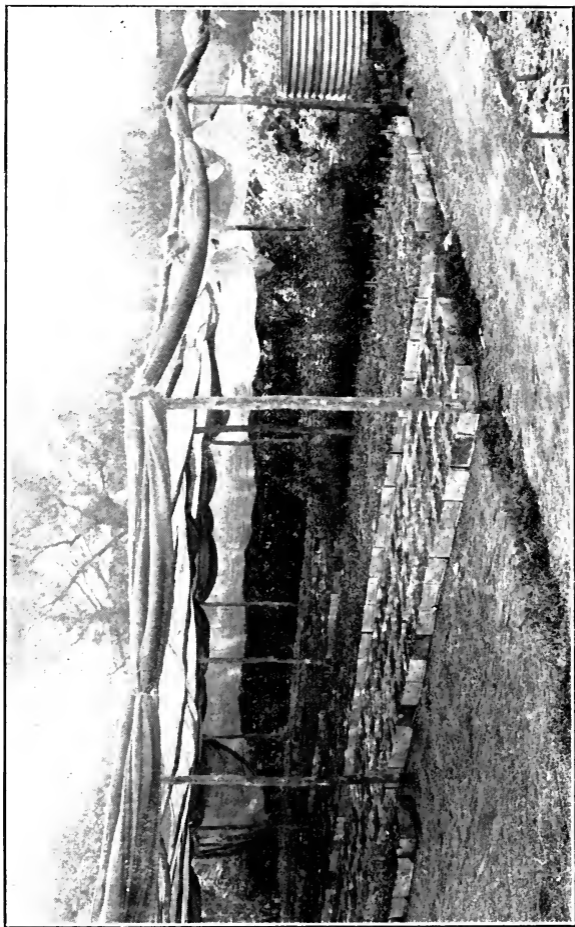
trained men, and grows them by the hundred thousand each season. While time is being spent on the few transplants, some far more important farm-business may be neglected. The chances are ten to one that at some time during the period of growth the water-can will be forgotten for a day or two and the whole batch perish, or, just at the moment when pricking out should be done, something else of far greater importance prevents the work being done. The right time for the first transplanting once past the work cannot be done well later. NO! We say emphatically that only where a very large proposition is under way, and a special man engaged for the work, is it wise for farmers to worry about growing their own transplants.

But there are some farms situated at such a distance from railways that it is impossible to get them transported from the Nurseries. Such farms are just as much in need of trees as those enjoying easier transport facilities, and for these we must briefly describe the best methods of growing the commoner trees from seeds.

The seed boxes, or tins, should be about four inches deep, and of such a size that they can be lifted about easily. Durability is not very essential unless they are intended for use more than once, for they should be finished within a few months. Punch or bore six or eight holes in the bottom of the box, and place about an inch of good drainage. On this put two and a half inches of good and rather sandy soil, which should be carefully levelled and pressed firmly down. It is now ready for the seed. The very small Eucalyptus seeds should be sprinkled very thinly on the surface. Cypress seeds may be counted and about three hundred sown in each square foot. Pine seeds are larger, and may be lightly pressed in at equal distances of say an inch apart. Seeds of other trees will be sown on the same general basis, varying with the size of the seed. The covering may be pure sand, light sifted *old* manure, or sandy soil. The depth of covering will be in proportion to the size of the seeds, from one-eighth of an inch for the small seeded Gums to an inch for the stout Pine. We like to water the soil well *before* sowing the seed, and then give a sprinkling to moisten the covering after the sowing is finished. After waterings will depend largely upon the weather and other conditions, such as shade, but no water should be given as long as the soil seems moist, and then only through a very fine rose. The common cheap watercan is specially made to *destroy* young plants, and the "Haw's Pattern" can should be used always.

Shade may be fairly heavy until the young plants appear, but immediately growth begins this should be only partial. Too much shade will cause them to become long and weak and worthless, and we want short and stocky plants. Gradually remove *all* shade and finish them off in the open.

Great care will be needed to avoid the many insect pests which are so plentiful in a farm-yard or garden. Slugs may be kept out



After "Peeking out" in 25's, a little temporary shade is necessary. The method shown here is made up of 8 ft. wattle poles as standards, with long, straight poles along the tops. The scrim or thin hessian is 6 ft. wide, but stitched into lengths and fastened to rough rollers, so that the shading can be rolled back in dull weather.

by surrounding the tins with ashes. A sheet of glass, or thin butter-muslin, will keep grasshoppers away. The period during which this danger lasts is only a short one, for young trees soon make a woody stem.

The first transplanting or "pricking out" should be done just as soon as the seedlings have grown the first fibrous roots,\* say when they are an inch and a half high. The seedlings are carefully lifted out of the seed tins in small clumps and divided up without breaking any of the roots. They are then planted into boxes or tins at distances of two and a half to three inches apart, and well watered down to settle the soil around the roots. The best transplant box is the common paraffin tin cut in half lengthways. This holds 25 transplants, and is always a convenient size and weight for handling later. Partial shade, such as an oblong hessian frame, will be necessary until all signs of wilting pass off, when the tins may be placed right out in the open to grow strongly and sturdily until the time arrives for planting out. The best average size of transplants for permanent planting is six inches.

Some tree seeds, particularly Acacias, Robinias, and Gleditchias, need a preliminary soaking before they are sown. In the case of Acacias it is necessary to pour *boiling* water on the seeds, and allow the seed to remain in the water until swollen. Robinia and Gleditchia germinate much more quickly and regularly if allowed to stand in warm water for a few hours. Some seeds, again, must be sown immediately they arrive, because the germ perishes very soon after the seed is gathered. These include Cedrus deodora, Araucaria, Cedrella, Acorns and Grevillea. Eucalyptus, Pines, Cypresses, and Acacias hold their germination for a long time, and may be sown at any convenient time after the seed is obtained.

The success of seed sowing depends largely upon climatic conditions. Our experience indicates that Autumn and Early Spring are the best seasons for the work. During the humid Summer months there is a grave risk of loss through "damping off" by fungous disease, for it is difficult to regulate the supply of moisture in rainy weather except where a "propagating house," or greenhouse, is available. During the Winter months germination becomes slow and irregular. Nearly all the most useful varieties of Gums will, if sown in March or April, be ready to plant out in November of the following Spring. Pines and Cypresses stand longer in the seedling tins, and are perhaps best raised in early Spring, and planted out 12 or 15 months later.

The time required for germination differs with each type, and again varies with temperature, &c. The following average periods may be a useful guide, and will be found fairly accurate for Autumn (April) sown seeds:

---

\*This will be when the second pair of leaves is made, except in the case of Conifers.

Acacias (soaked seed)	..	..	..	..	14	days.
Callitris	..	..	..	..	21	”
Cedrella	..	..	..	..	16	”
Cryptomeria	..	..	..	..	26	”
Cypresses	..	..	..	..	21	”
Cedrus decdora	..	..	..	..	30	”
Casuarina	..	..	..	..	14	”
Gleditchia (soaked seed)	..	..	..	..	21	”
Grevillea	..	..	..	..	21	”
Juniper (cleaned seed)	..	..	..	..	*60	”
Eucalyptus	..	..	..	6 to	14	”
Pines	..	..	..	..	21	”
Peppertree	..	..	..	..	21	”
Thuya	..	..	..	..	21	”

\*Often longer.

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## CHAPTER V.

### TRANSPLANTING AND CARE OF PLANTATIONS.

TRANSPLANTS and land should be quite ready for work by November, or at the latest December. We want our trees to get well established, and some growth on them before the dry season comes, and, therefore, should get them in just as soon as possible after the first good rains. We do not mean to say that trees planted out, even as late as March, will not live and grow well. If it is impossible because of pressure of other farm work to plant out before the end of the year, then by all means do the work then. It is best to plant early, but it is also better to plant out in February or March, than to lose another year. Trees planted in November will put on a lot of growth the same season, and we have known Eucalypts to grow six feet during their first season. Trees planted in March will root well, and be ready for steady work the following Spring.

#### Spacing.

There is much difference of opinion about the correct spacing of trees in plantation form, and you must not be astonished if our recommendations do not agree with those of others. We will only say that we have, as far as possible, obtained the opinions of our best authorities, and give the consensus of this opinion. We have also carefully examined the best plantations.

When laying out a plantation we have several aims, the chief of which are:

- (1) The killing out of grass by canopy as quickly as possible to destroy the fire risk.
- (2) Saving of cleaning labour.
- (3) Early dropping of lower branches to get a good clean stem.
- (4) Straight growth.

The fire risk is best met by a first year's thorough cultivation—perhaps in some species by a second year's cleaning also—by means of a six disc heavy cultivator, such as is used by Wattle growers. For this implement an espacement of eight feet, in squares, is just right, and will leave practically no hand cleaning to do unless the land has been old and foul. At an espacement of eight feet a good canopy, sufficient to kill out grass, will be formed, with most species, by the end of the third year. This espacement also causes the early fall of the lower branches, and the straight forcing upwards of the stem.\*

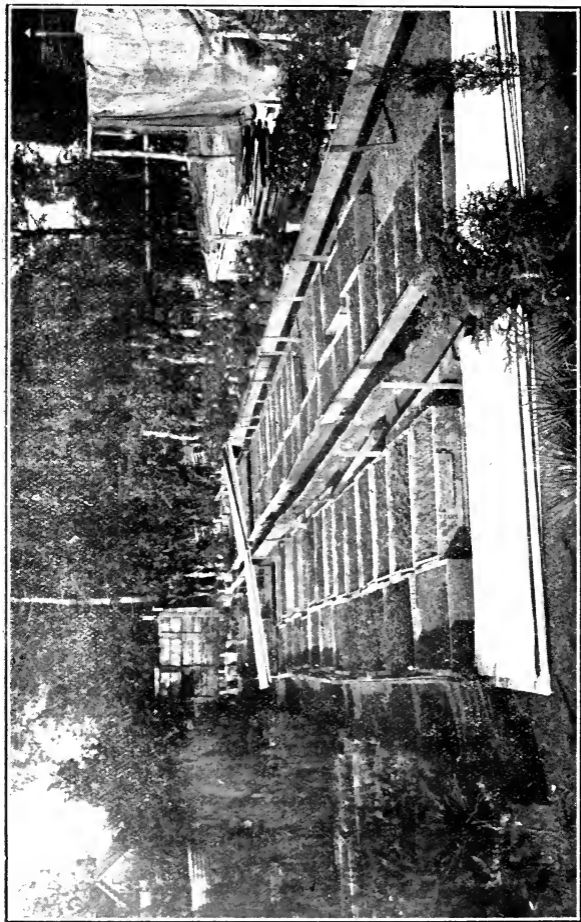
In marking out the squares it is best to use a chain, and accuracy in this work will make all cleaning, thinning, and felling much easier later. A useful chain for laying out plantations can be made of plain galvanised wire, gauge 8 or 9, with joints six feet apart. This can be made of any desired length. The chain is laid along the line, and a young tree planted at each joint. Some planters prefer first to put in a small marker (say a six-inch length of strong reed or stick) at each joint, and to move on the chain before the actual planting is done.

If the instructions of Chapter IV. have been carried out, the seedlings will be ready now, equally spaced in tins of 25. Care is necessary in taking them from the tins, so that the roots are disturbed as little as possible. One method is to cut the contents into 25 small squares with a long knife, and then to take out each square intact. Another is to take out one side of the tin and remove each seedling separately from that side. Whatever method is used the object must be to avoid breaking and disturbance of roots, some types suffering very considerably from such disturbance. It is an easy matter to make holes at the correct distances with a hoe in the well-pulverised land, and the actual planting and firming of the soil takes very little time. Four good boys should plant an acre a day in good weather. If the trees need watering in, which may be necessary if a wrong estimate of weather conditions has been made, an extra boy will be necessary. In this case one watering will keep the trees alive for a month, and in most seasons a good rain will have fallen within that time.

During the first year the land should be *twice* cultivated. This both prevents the fire risk and conserves moisture in the soil for winter use. Cultivation will also be necessary the second year, at least once. At the end of the second year most utility types will have closed up their branches.

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\*This does not apply to *Pines*, which require much closer planting, either 3 by 3 or 4 by 4 feet.



A range of free-seedling boxes with sheets of corrugated iron arranged as protectors from heavy rainstorms.



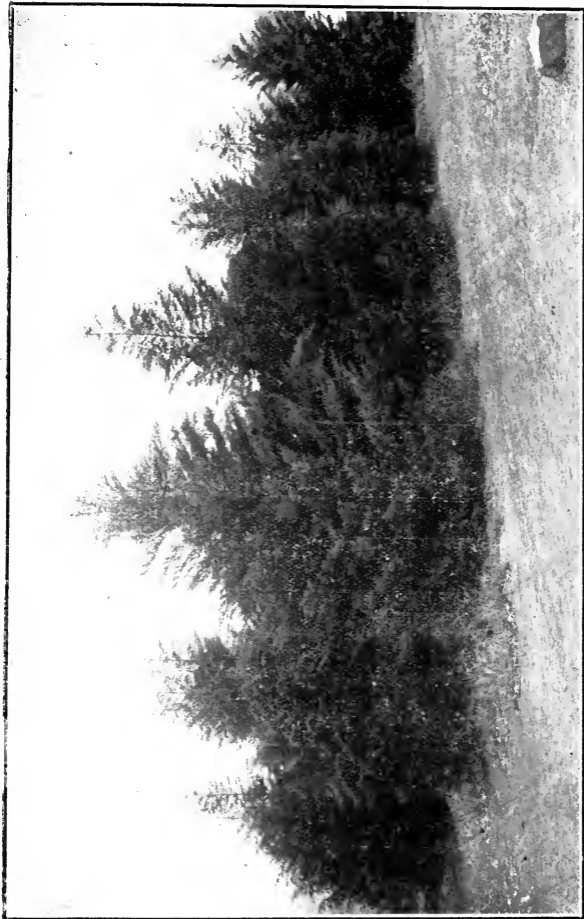
Where inflammable trees, such as Pines, Cypresses, and Wattles are planted, the firebreaks will need careful attention each early Winter for a few years. An additional precaution is to sow a belt of Blackwoods around the area. Blackwood seed may be soaked and sown in the same way as the "Bark" Wattle, and will soon make an impenetrable protection.\*

**THINNING PLANTATIONS.**—Trees planted 8 by 8 ft., as in the case of Gums, or 4 by 4 ft., as in the case of Pines, or Cypresses, will not, of course, grow into good trees without more room. This room for development is given by a process of thinning out at what is considered the correct time—that is, at just the time when normal development is likely to be checked by want of water or feeding room. In the case of Pines and Cypresses, the thinning out will depend altogether on the appearance of the trees. In the case of Gums, it will be from 8 ft. by 8 to some larger espacement. In the earlier days of our South African afforestation work this thinning was done with a sort of mathematical precision, holding on to the full lines of growth quite irrespective of the quality of the trees. This method sacrificed many very excellent trees, and also left standing many which were very third-rate. In actual forest practice it is found that lines of trees do not grow equally well throughout. There is a tendency in places for groups of first-class trees to form, especially in pockets of extra good soil, and the whole of the members of the groups would continue to develop well even if left comparatively close together. It has been found best, therefore, to thin out on some well-defined basic principle which preserves the quality of the trees. This is somewhat difficult to explain on paper, although quite easy by ocular demonstration. First, the "weedy" trees, with extra thin, or deformed, stems, come out. Then note is taken of the *canopy* level at the top. Quite a large number of trees will be noted which do not reach the top or average level by a few feet. These do not get their fair share of sunlight and air, and will, in a year or two, become so dominated by the taller trees that their development stops almost completely. They may as well come out. This principle of thinning out the "weedy" trees will continue as long as the plantation is growing. Although the regularity of the plantation may be destroyed, the average value of the trees left will be immensely increased.

All the wood taken out of a plantation in thinning should be saleable as laggings, rails, posts, droppers, &c., and the sales should amply pay the cost of the work.

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\*In good afforestation it is considered that the size of a block of trees of one variety should not exceed 20 acres. This is to decrease the risk of any disease spreading.



*Cupressus lusitanica*, 6 years old.

## CHAPTER VI.

## CHOICE OF TREES.

WE have already given the opinion that the production of Saw-timber, such as railway sleepers, may be considered as the work of the State. What we have further to consider is what species should be chosen, for general utility, which will give a fair return in from 12 to 25 years, or at the most 30 years. Within this time limit it is possible to grow trees for furniture (where small wood can be used): Mine timber (props, laggings, "pigsty wood," &c.); some of the woods used in wagon building, box-wood, rails and fence posts, firewood, and a few other odd uses. In addition, there are the shelter trees and windbreak trees.

FOR FURNITURE the two best and safest trees would be *Grevillea robusta* (Silky Oak) and Blackwood (*Acacia melanoxylon*). Some of our readers will remember seeing a beautiful bedroom suite exhibited by the late Mr. Reed, Cabinet Maker, on the *Maritzburg Agricultural Show*. Mr. Reed assured us at the time that *Grevillea* makes an excellent, easily worked furniture wood, taking a high polish, and with beautiful markings. The time required for growth to a useable size is about 25 years. When young the tree is very susceptible to frost, and its cultivation will, therefore, be limited to fairly warm districts, with not more than a maximum of 8° F. of frost. It does remarkably well in the deep, red hill soil of the Natal Midlands.

Blackwood is more cosmopolitan, and appears to be quite at home up to an elevation of 4,000 feet, with a frost maximum of 15°. It will make a good useful timber in 25 years, or even in some cases in 20 years. The wood is already used by wagon builders in South Africa, and is much appreciated. Maiden, the Australian authority, says that Blackwood is probably often substituted for American Walnut, and that it is highly valued for making furniture, billiard tables, gunstocks, railway and other carriages, parts of organs, pianos, &c.

FOR MINE TIMBERS we will probably be well advised to confine ourselves to the quicker growing Eucalypts. Most of the wood used is only required to last seven to ten years, so that moderately firm wood is quite suitable. After carefully enquiring what is required, and comparing the growth, &c., of the many kinds of Gums now growing in Natal, we are of the opinion that the best varieties for this purpose are *E. saligna*, *E. globulus*, *E. amygdalina*, and *E. tereticornis*, the two former being best for com-

paratively warm districts, and the two last for colder areas. The growth of mine timber is likely to give a handsome return for many years to come.

For Boxwood the best are *Pinus insignis*, *P. longifolia*, *P. palustris*, and *P. pinaster*. The danger from the fungus disease, *Diplodea pinea*, seems now to be past, and more confidence may be reposed in pine planting. Some of the Mexican pines are promising well, but as young trees are very difficult to obtain as yet, it is useless recommending them. Outside the Pine family we have several Cypresses which are just as good for the purpose, particularly *C. lusitanica*, *C. lusitanica glauca*, *C. macrocarpa*, *C. torulosa*, *C. goveniana*, and *C. McNabiana*.

In the Natal mist belt another very promising tree is *Cryptomeria japonica* (Japan Cedar), a good, straight timber, light and durable, and of speedy growth. This tree will make excellent box-wood, and is more used than any other timber in Japan.

At the Natal Government Asylum, *Cedrella toona* (Indian Red Cedar) is doing remarkably well, and promises to make first-class timber in 25 years or less. "The timber is soft, red, durable, not eaten by white ants, scented, and easily worked" (Gamble). This tree will not stand any frost when young, and its locality is, therefore, limited to warm Southern and South-Eastern slopes in the Eastern Midlands.

**MATCHWOOD.**—In moist land and moist southern slopes a plantation of poplars is a good payable proposition. These are propagated by means of cuttings, preferably rooted in nursery ground and then transplanted to the plantation. The white poplar is the one now most commonly sold for matchwood, but there is a serious objection to this in the multitude of suckers it throws up, which, unless carefully suppressed, rob the main stems and delay growth. The variety *monilifera* seldom throws suckers, and is of better growth and equal value for sale. *Populus macrophylla* will probably be found an excellent tree for the same purpose. All the poplars are of quick growth, saleable in from 15 to 25 years, and the demand will increase.

Other trees suitable for some districts and situations are *Casuarinas*, *Pinus insignis*, *Pinus pinaster*, and *Callitris* (*Frenella*).

Of the varieties of *Eucalypti* we would choose *E. saligna*, *globulus*, *viminialis*, and *amygdalena* for warm districts, and for the cold areas, *E. rudis*, *E. viminialis*, *E. stuartiana*, and *E. rostrata*. Of the Cypresses the best are *C. torulosa*, *C. lusitanica*, *C. macrocarpa*, *C. goveniana*, and these are likely to do well all over.

*The use of rails* about a farm is often considerable. While, in a sense, all the trees we have mentioned will make rails, it is worth while to consider here which trees make the best. If "Wattle" is allowed to become dry it splits, and those who have worked it know how difficult it is to drive a nail or staple into it. Most of the Gums also split up in drying, particularly at the age when they are most suitable for rails. One trouble with both

Gums and Wattles is that nails and staples will not hold well. Blackwood does not split so readily, but nail driving is exceedingly difficult in this wood also, on account of its extreme hardness. The best rails we have seen are those made of young Cypress, six or seven years' old. True, they want a little more trimming and preparing, but they last well, and every nail and staple grips well. *Gleditchia triacanthos* will also make a good rail, and even a good dissel-boom.

Only a few of the available species have been mentioned in this chapter—just those which we know to be of general utility. A good many more will be found briefly described in the schedule of utility trees on page 43.

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## CHAPTER VII.

### WINDBREAKS AND SHELTER TREES.

WE have already mentioned, briefly, the subject of Windbreaks. But the subject is of such great importance to farmers that we make no apology for dealing with the subject at greater length here. There are signs already that farmers are recognising that it is not only necessary, but easily possible, to provide shelter on farms where no natural shelter exists, and the arguments in favour of this are so strong, that once the subject is fairly considered most men are readily convinced that it is the right thing to do.

The points to be considered here are:

- (1) Uses of shelter belts.
- (2) Arguments against.
- (3) Cost of production.
- (4) Choice of trees.
- (5) Protection from fire and animals.
- (6) Shelter for special purposes.

#### (1) Uses of Shelter Belts.

They cannot be put to many of the uses which are common with plantations, such as firewood, poles, &c., because we must look upon our "break" as a permanent feature of the farm, to be left alone for a lifetime and handed down to our children. They are not intended for felling and direct sale, but for the production of comfort and beauty and wealth, by their very presence, indirectly. Their main utility may be dealt with under five heads.

(a) *Shelter for stock from cold winds.*—Many thousands of cattle and sheep are lost each Winter from sheer exposure, and the thing which kills is not the frost of the quiet night, but the biting, continuous cold winds which sweep over all our high veld farms during June, July, and August. Even where death does not follow this exposure, the cattle become thin and weak, not only because of the cold, but also because this bitter wind destroys, by dessication, the grasses on which the animals live. In a few rare cases it may be feasible to *house* the cattle during Winter, but this is not generally possible. In a few other cases, on Natal and East Griqualand farms, there may be natural forest in which the animals will find warmth during the three cold months. Elsewhere there may be some few low veld farms, with warm valleys by way of protection. But these three sets of conditions are not general, the vast majority of farms being exposed all Winter to the bitter mountain winds blowing from proximate or distant snow-fields.

*You know* that cattle which are exposed lose condition, stop growing and often die. *And you know* that on farms where they are sheltered they keep their condition, although food may be scarce, and that the young stock there grow all the year round. With this knowledge the wise man will say to himself, "I will create shelter by planting trees. I cannot build houses to take my stock into, but I can *grow trees* which will break the force of the winds which rob and kill, and provide warm nooks in which my animals can live in peace and comfort."

(b) *Shelter from dry winds for Grass lands.*—We have hinted above that a secondary effect of cold winds is that of dessication of grasses. The reason is that our winter winds are *exceedingly dry*, and, as they sweep over the country, are acting like gigantic suction pumps, robbing the soil, through the plants, of all moisture. The grasses turn brown and die gradually, all nourishment is gone—and the cattle starve. Here is another thing you know: In sheltered valleys, in corners of the bush, and about the homestead, the grass remains green and succulent much longer than out in the open. It is about the homestead only that one finds Fescue grass growing vigorously during August, and the *Poa annua* forming its mat of greenness. This is not because it is really any warmer in the sheltered spots—there is often more actual frost there than outside—but *because there is shelter from the drying winds which kill*. The animals search out such spots as these.

This drying wind is, more than anything, the cause of the drying out of what should be *permanent* imported grasses, and the cause, very often, for failures in getting a "stand" of grass seedlings even in February.

Shelter belts of trees, judiciously chosen, well planted, and at right distances and positions, will create just the break we want for this enemy.

- (c) *Shelter for growing Cereal crops.*—In this country it seems both a bold and unorthodox thing to advise farmers to plant trees around their "land." Yet this is what we here do, and even go so far as to say that when the "lands" are large they should be split up into small fields, so that distances are not too great to get away from the shelter. It is quite true that in this case one must perforce utilise some good arable land for planting our "break," but we do not hesitate to assert that the increase in the crop on the less cereal area available will far more than make up for the loss of ground put into trees.

Cereal crops suffer from strong winds in two ways; from the hurricane power of winds preceding and accompanying thunder storms, and from the evaporative effect of dry North and East winds. With the storm wind there is often hail, and if a high wind is behind the hail, the effect is disastrous. If, on the other hand, the hail falls straight down, little damage is done. The evil of the storm winds lies in its breaking and "laying" effects, each storm reducing the yield of grain per acre.

The worst of our dry, hot, North winds are of very great velocity, particularly so in the Natal Midlands. We have many times seen, in the early morning, a magnificent young crop of Mealies, deep green and strong, which before night, after a few hours of "hot wind" was drooping and parched and almost white. Although recovery may take place later, the loss of stamina in the plants is very serious, and never quite made up. It means, again, a reduction in the number of muids of grain per acre. This is the extreme case. But, during the growth of a crop there are many days of drying winds, which are continually pumping out soil moisture and robbing the plants of life.

At present one sees miles upon miles of country which are a flat expanse of mealie fields, not a tree visible. There is a time coming when fields will be smaller, and each will be guarded carefully by a regiment of trees. Preservation of water is of far greater importance than much manuring. It means continuous instead of spasmodic growth, and the perfect filling of the grain before harvest.

- (d) *Prevention of Soil Erosion.*—Where wastage of soil, and the formation of "dongas" is a very serious danger, it is necessary to carefully study the problem from all standpoints, and there may be other methods than tree planting which will be useful as preventives. All that we desire is to point out that the planting of lines or breaks of trees at intervals on the land will most effectually break and spread the stream

of water caused by storms. The roots bind together the soil so that it is scarcely possible for any serious washaway to take place, even on a fairly steep slope.

- (e) *Increase of value and beauty of farm.*—A farm well planted with trees is worth twenty-five per cent. more than a bare veld and wire-fenced farm. Its attractive and pleasing appearance, its warmth and shelter for stock, and the actual cash value of the trees themselves, are all real factors in valuation. Money put down in planting trees is well invested, and will all come back again with good interest.

It may be that our farmers, or many of them at any rate, are at present better pleased by a long veld view than by confined vistas. We are used to great distances. There is something grandly enthralling about the illimitable, true; but a farm can never be called really beautiful, or even really comfortable, until its boundaries are guarded, its fields sheltered, and the homestead nestles snugly under the protection of trees.

## (2) Arguments Against.

There are always some few reasons why we should *not* do a thing. No good thing is without some few disadvantages. But the reasonable man will carefully weigh up the arguments for and against, and act in accordance with the result. Some few reasons have been advanced even against tree planting for shelter, and it is as well to see what they are worth. For instance, one man, whose farm is only a very few hundred acres, will say that he cannot possibly spare any land for trees other than enough for firewood. The reply to this would be to refer again to the certain increase of crops where shelter is given. It is always better economy to cultivate 10 acres yielding 150 muids of grain, than to cultivate 15 acres yielding the same quantity. If, then, a field be reduced by one-third, even, in order to obtain the necessary shelter, *it will pay*. But the actual proportion of ground taken up will not be anything like this.

Another objection is that the cost is prohibitive. This will be answered in Section 5.

It is pointed out that the ground actually occupied by the trees is not all the land lost, and that the roots of the trees spread afar, robbing the soil for long distances away. There is some force in their argument if Wattles or Casuarinas are planted. But why choose such trees? Some types have root systems which are compact and confined enough.

Another, and a more reasonable objection, is that if trees are planted in the North of a field, the Autumn sun is not able to reach and ripen the grain. There is a section of the field which is continuously cold and shaded. Sunlight is essential to a crop for ripening the grain, and to shut out the sunlight must be unwise. Well, there may be some little logic in this, but the section



of shade is, at any rate, only a small one in proportion to a well-laid field, and it would be very seldom that a shelter belt would be so accurately East and West as to absolutely keep the sunlight away all day long. The ripening process would not cease, but would only be slightly prolonged.

These arguments against trees are weak and small when compared with the great advantages to be gained.

### (3) Position and Distances.

The line chosen for a shelter belt will vary in different districts. On the colder farms of Natal, for instance, the Berg winds blow from the West, and to break these winds shelter would be needed on the Western boundaries of the paddocks. In the Eastern Orange Free State the cold winds are generally from the South-East, and the break would need to be on that side. In the Natal Midlands the chief trouble comes from the North-West thunder storms, and the North-East and North winds. Here an angle is necessary to protect from both. So one might go on enumerating the need of each locality. But all we need to work upon is the principle which says, "Shut off the worst winds, the prevalent cold or hot or strong winds, wherever they come from."

It is seldom possible to follow this rule with accuracy, for land contours, shape of "lands," aspect of fields—all must needs modify the position. We must just get as near as we can to our objective.

How far apart should shelter belts be planted, in order to provide for continuous shelter? When the wind reaches a tree belt it goes over it in a fairly abrupt sweep upwards, and descends on the lee-side in a very gradual slope. Scientists have demonstrated that a belt of trees will shelter for a distance, to leewards, of *ten times their own height*. Thus a belt 60 feet high would shelter a paddock 200 yards wide. Here then is the limit to the *width* of the paddock—ten times the height when fully grown, of your shelter trees. The *length* of the paddock or field may be just whatever is convenient, if that length is at right angles to the wind you want to keep out.

The size of the fields on our farms will eventually be fixed by this rule of shelter. At present they are far too large. Economic farming means small fields, well cultivated, well manured, and well sheltered.

The *width* of the *belts* of trees will vary with circumstances. The man with the small farm will make them as narrow as possible, consistently with effectiveness. But where land is plentiful, there is no reason why a good broad belt should not be put down. It is probable that the minimum for effectiveness may be taken as a triple line, the centre line being chosen for *height*, and the outer lines for compactness. Then to ensure *compactness*, it is necessary to plant at an espacement of 6 feet apart each way, so that the break may become almost impenetrable, when

well grown, to the strongest winds. Again, the planting should not make straight lines *across* the break, but should be *diagonal*, thus:



The *minimum* width thus occupied by the trees and their roots will be about 24 feet, provided suitable types are chosen.\*

We need say nothing here about providing young trees, or preparing the land. The processes are exactly the same as described under "utility trees," and the time of planting the same.

#### (4) Choice of Trees.

The actual types or varieties of trees chosen for our purpose will vary with soil, climate, aspect, &c., and these vary so very much in South Africa that no man is capable of laying down rules which are applicable to even small districts. This is a point for careful enquiry, and your District Forest Officer will be the man most likely to know best what to recommend. Get into touch with him before choosing your trees, and follow his advice.

Apart from this definite choice of varieties, however, there are certain general requirements which the trees must meet for our purpose, and these we may safely enumerate. Our trees must have:

*Height*, so that the area sheltered is as broad as possible. By this we mean *central* height.

*Density*, to effectually reduce the wind velocity.

*Quick growth if possible.*

*A good root system*, of a compact nature, so that the proximate crops are not robbed of nutriment.

*Hardiness*, because a narrow belt of trees is much more exposed to adverse conditions than a solid block in forest form.

*Long life*, and with no tendency for odd specimens to die out and leave gaps.

The different varieties of Eucalyptus will give central height, quick growth, hardiness, and a fairly long life; and varieties may easily be chosen to suit most conditions. But the root system of a Gum is very spreading and greedy, and for this reason this type should only be used to give height, preferably as a closely planted single or double line. As they grow the lower branches generally drop and leave a space through which the wind could still sweep. Hence, with these it is necessary to use flanking trees to fill up the base, preferably Coniferae, of which the Cypressess are probably the best. The root system of a Conifer

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\*More recent observation indicates that cypresses should be planted more than 6 feet from gums, and that 8 feet would be better.

is fairly compact, and does not rob the soil for any appreciable distance beyond the branch spread.

For surrounding fields avoid Wattles as you would poison. Their roots wander for many yards and they are of very short life.

For the convenience of those who cannot get the information otherwise, we have appended a list of trees which are most suitable for the purpose, and have separated them into climatic groups as far as it is possible to do so without actual inspection of local conditions.

### (5) Cost of Shelter Belts.

The actual cost of planting and fencing will vary with distance from Coast and Railway, hence any figures given under this heading must be modified according to cost of material for fencing and trees. Where there is time and a liking for the work, the trees may be raised from seed, and on some farms this may be necessary because of transport difficulties. Presuming, however, that we take a cost of fencing as £20 per mile, ploughing and harrowing at 20s. per acre, trees at a penny each (they can be purchased at 60s. per 1,000), and cleaning twice at 5s. per acre, the cost per 100 yards of "break" would be:

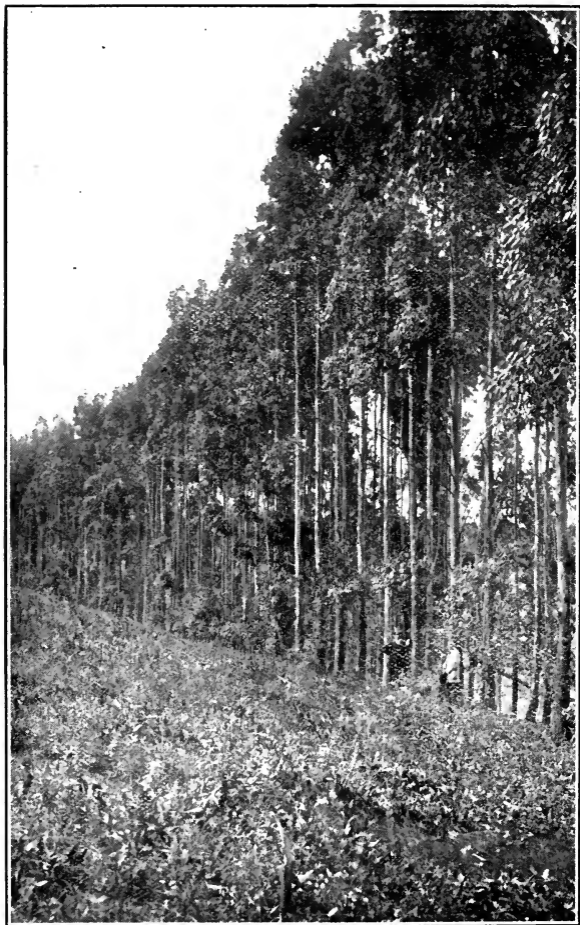
	£	s.	d.
150 trees .. .. .	..	12	6
Ploughing and Harrowing ..	..	4	0
Fencing .. .. .	1	2	9
Planting .. .. .	..	2	6
Cleaning .. .. .	..	2	6
		<hr/>	
		2	4 3

per 100 yards of triple line.

Although the "break" is fenced on two sides, only one side is chargeable against it, the other being an ordinary, necessary paddock or field fence. The figures should be taken as *contract* rates, for a farmer's cost of preparation of land is much lower, and trees will probably cost less. Based on the shelter capacity of the windbreak, the cost at the above figure is, approximately, 9s. per acre.

### (6) Protection from Fire and Animals.

Full allowance has already been made in our estimate of cost, for a good fence to keep out cattle, horses, sheep and goats, for this is absolutely necessary. Apart from this, the risk of damage from animals is only from *rats* and *rabbits*, which occasionally eat the bark during the Winter months. This seldom occurs, however, where the trees are kept free from grass, and this cleanliness is the best preventive.



*Eucalyptus saligna*, planted as shelter belt in pasture land.  
9 years old and 70 ft. high.

With clean growth the fire risk would be a very small one, for we must presume the trees to be around cultivated fields, growing grain crops, green Winter fodder, or good grasses, and not as mere divisions to the natural veld. Where they are planted for veld protection it will be necessary to take the usual precautionary measure against fires during the Winter. Coniferous trees, which will probably form the outer lines, are very inflammable, and this portion of the break should reach right down to the ground, the lower branches sweeping the soil.

SHELTER BELTS FOR SPECIAL PURPOSES are to be planted on the same general principles as those for the fields. These may be wanted for orchards, dams, outbuildings, garden, or house. Trees to protect orchards should be chosen for freedom from scale and other diseases, and probably Cypresses and Oyster Bay Pine are the cleanest.\* These should be planted well away from the fruit trees, fully 40 feet away from the nearest line. Trees for the homestead should be kept well away from the buildings. It is more healthy to have a clear space of lawn, gravel, and yard around, than to be absolutely closed in by foliage.

When planting shelter trees for any purpose, it is wise to carefully choose the seedlings, so that all those planted are vigorous and shapely. Equal and strong growth are of great importance, and the whole effect, both for shelter and appearance, will be spoilt if gaps occur.

### Schedule of Trees Suitable for Shelter Belts.

<i>Cold Districts.</i>	<i>Coast Districts.</i>
Cupressus benthami (40)	Oyster Bay Pine (40)
„ horizontalis (50)	Cupressus lusitanica (45)
„ lusitanica (45)	Eucalyptus paniculata (80)
„ macrocarpa (50)	„ regnans (100)
„ torulosa (40)	„ saligna (80)
„ arizonica (40)	„ maculata (60)
Eucalyptus amygdalina (80)	Eugenia eucalyptoides (40)
„ sideroxylon (60)	Juniperus virginiana (50) slow
„ pauciflora (60)	Albizzia lebbek
„ gunnii (80)	Castanospermum-australe
„ rostrata (70)	Sterculia diversifolia
„ rudis (50)	Camphor tree
„ stuartiana (60)	Cinnamomun camphora
„ viminalis (70)	
„ tereticornus (60)	
Juniperus virginiana (50) slow	
Pinus insignis (50)	
„ pinaster (50)	
„ thunbergii (60)	
„ halepensis (50)	
„ palustris (60)	

\*Where an Orchard consists of Apples *only* a deciduous "break" may be planted, but these would not break into leaf early enough to protect peaches.



A good shelter belt for an orchard. Front line, Oyster Bay Pine.  
Back line: *Casuarina tenuissima*, 8 years growth.

*For Midlands, 2/4,000 feet. For Dry Western Districts and Thorn Country.*

Acacia melanoxyton (Black-wood) (50)	Casuariana tenuissima (60)
Callitris australis (Oyster Bay Pine) (40)	Cupressus arizonica (40)
Cupressus lindleyana (50)	"    benthami (40)
"    arizonica (40)	Schinus molle (25)
"    lusitanica (45)	Callitris verrucosa (40)
"    sempervirens (60)	Eucalyptus corynocalyx (80)
"    torulosa (45)	Not above 3,000 ft.
Eucalyptus amygdalena (80)	"    paniculata (80)
"    corynocalyx (70)	"    leucoxyton (80)
"    regnans (100)	"    polyanthemos (60)
"    globulus (100)	"    rostrata (70)
"    robusta (80)	"    stuartiana (60)
"    saligna (80)	Juniperus virginiana (50) slow
Juniperus virginiana (50) slow	Cupressus sempervirens var.
Pinus insignis (50)	horizontalis (60)
"    palustris (60)	Angophora lanceolata
"    pinaster (50)	
"    thunbergii (60)	
Thuya orientalis (30)	
"    gigantea (Lobbii) (50)	

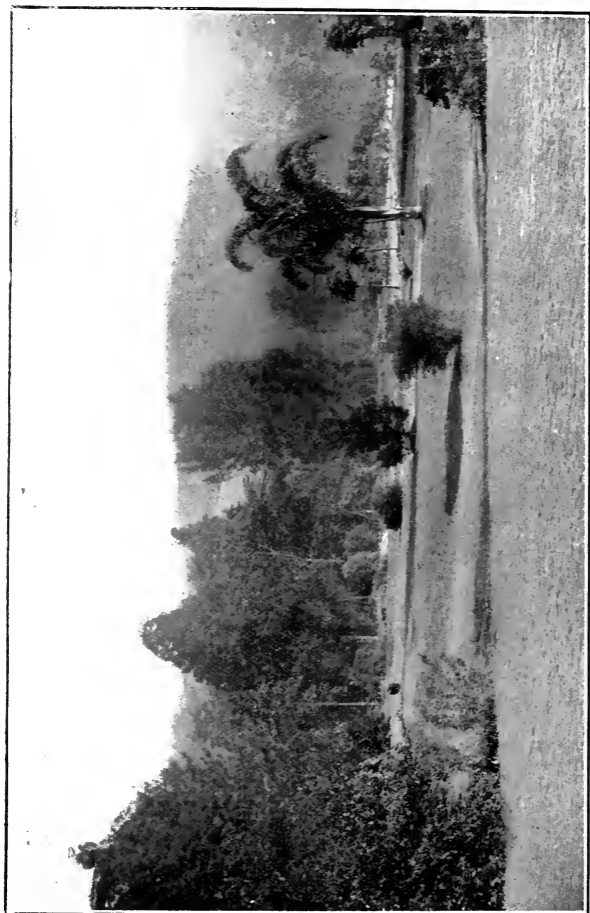
The figures give the approximate height to which the trees will grow, under favourable conditions.

## CHAPTER VIII.

### WATTLE CULTURE.

(Acacia mollissima.)

THE subject of Wattle culture has become such a large one that we hesitate to mention it within the pages of this handbook. Yet it seems desirable that some reference, however brief and incomplete, should be made here. We write this chapter purely as a guide to those who have little knowledge of the subject, and at the same time recommend that all our readers who contemplate planting largely should make careful investigations at existing plantations before commencing work in earnest. Some, however, may find it advisable to plant on a smaller scale, desiring to



The finest view of the Botanic Gardens, Maritzburg. The specimen palm is *Cocos plumosa*.



produce firewood, with bark as a bye-product, rather than bark with firewood as a bye-product. Others, again, may not have time or the opportunity to make special investigations. For such the following information may be useful.

### Necessary Conditions.

*Acacia mollissima* does not succeed under all conditions, but requires a set of conditions, for commercial purposes at any rate, quite well defined by the experiences of the last 30 years. It is not a success in Thorn Veld, nor on the bleak and cold high veld. Northern slopes and shallow soils are to be avoided also. The following points should be carefully considered in order that the right choice of land, and situation may be made.

- (a) *Land may be too valuable for Wattle Culture.*—There can be no doubt that many Midland farmers have planted Wattles on land eminently suitable for the finest Agricultural produce and these will eventually see that the return from the trees is not nearly so large as would have been the accumulated returns from crops of farm produce, or from dairying. Land which will grow 10 muids of Mealies per acre, will yield a profit of about £3 per acre per annum at least; whereas it is very rarely that the best of our Wattle plantations will yield half this amount. We hint at this so that the point may be considered when land is chosen.
- (b) *Soil and Soil texture.*—The soils on which the best results are being obtained is the red igneous soil of the Natal Midlands. As a rule this soil has plenty of depth and is of that half-porous, moisture-holding nature, in which all trees seem to live at their best. Yet it is not absolutely necessary that this particular soil only should be chosen. The chief conditions necessary are *depth*, porosity enough to prevent accumulation of too much moisture; not too great a proportion of heavy clay, which, generally, is too tenacious and cold, and average general fertility. By fertility, we do not mean land which is rich enough to grow a good Mealie crop, but rather that which produces a fair crop of good grass. Where possible it is preferable to choose new land—unbroken veld—this being much cleaner for working than old arable land.
- (c) *Atmospheric Conditions.*—There should be a rainfall of from 25 to 35 inches per annum. Although many indigenous Acacias are quite at home in the Thorn Country, the exotic types will scarcely live in such localities, or at best form only a miserable, useless stunted growth. The area where the necessary rainfall occurs is almost confined to Zululand, Natal, East Griqualand, and some parts of the Eastern portion of the Cape Province. In one or two favoured localities it may just reach into the extreme East of the Transvaal or Orange Free State, but in such places the colder climate usually makes Wattle growing unprofitable. Further West

the Coastal humidity gradually decreases until continental conditions of atmosphere prevail.

- (d) *Heat and Cold*.—Where there is plenty of atmospheric moisture the extremes of Summer heat do not seem to seriously affect the growth, and failures on the Coast lands are more probably due to the nature of soil, or subsoil, than to heat. The extreme limit of cold which this *Acacia* will stand, however, is very marked and again defines the area of possible successful cultivation. It is not likely that any plantation could be successfully laid down where the minimum Winter temperature reaches 15 degrees or more, of frost. This, however, does not necessarily mean that a whole district, or even a whole farm, need be looked upon as hopeless for *Wattles* because at some part of the farm the minimum temperature is a low one. There is very often a difference of 10 degrees between the flat portion of a farm and a hillside, but a little distance away. Shelter from cold winds, elevation above cold flats, warm up-draughts caused by the contours of land—any one of these may make the proposition a success in the colder districts. Again, Autumn sowing, which allows the young plants to lie prone on the ground during the first Winter, may ensure the success of a plantation in some rather cold districts.

### Methods of Culture.

No two large *Wattle* planters will agree on all points of culture. They vary in their opinions of ploughing, distances, cultivation, and reaping also. The opinions and advices given on this point, therefore, may not agree with those of some old planters, but will, we think, be found quite practical for all purposes.

*Preparation of Land*.—One planting, just sown, which we have watched this season, was bare veld in November, ploughed in December to February, disc harrowed as fast as ploughed, and sown with seed in March. This was the work of a practical man, and yet we feel sure that if he were asked for advice, he would not advise this way of putting down a plantation, but would explain it by calling it an *urgency method*. It is not an unusual way, but it is actually rather slipshod and hurried, and not calculated to give the best returns in the end.

The planter should aim at quick and early and even growth of tree from the beginning, and this cannot be got by an uneven and hurried preparation of land. The season which is supposed to be saved is lost again in later years, and the so-called economy in ploughing is lost many times over at reaping time.

Our advice is to plough a six or seven inch sod in Autumn, and let the sod lie and rot over Winter. As soon as the Spring rains will allow of a recommencement of work, cross plough well, and let the disc harrow follow this ploughing at once. This will give a well pulverised and clean seed bed ready to hold fast the

rain which falls before the Winter. In the Midlands sowing may immediately follow the harrowing. In the rather colder districts it may be found advisable to do the cross ploughing and harrowing later, so that the later sowing will allow the young plants to lie flat during the cold months. The ploughing will seem deep to some readers, but the effect of this during the first few months of growth is enormous. With a shallow four-inch ploughing the whole of the soil turned over will become quite dry during May, June and July after sowing, and root growth will stop. The deeper ploughed ground will remain moist, and allow of the continual formation of a mass of roots which will force on several feet more stem growth during the first Spring. An instructive result of deep ploughing was told to us by one of the larger planters. A steam plough had been used for one area, and had ploughed so deeply that the subsoil had been turned up to the surface from a depth of more than a foot. This subsoil was poor stuff, and the young Wattle plants had a great struggle to get along at all for the first season, being far surpassed by those in land only ploughed 5 inches. In the third year, however, they had not only caught up with their competitors, but had outstripped them by a level four feet of growth.

*Lining-out and Spacing.*—On this point opinions vary very much, and one sees trees spaced 12 by 12 feet, 12 by 6 feet, 8 by 8 feet, 6 by 6 feet, &c. Which spacing is one to adopt? Each planter will swear by his own spacing as the correct one and giving the best results. To get a reply to our question, we must get down to principles again, and we shall find that these are very similar in most ways to those mentioned in connection with afforestation generally.

We want (*a*) a good long stem, free of branches, which will peel easily; (*b*) thick and healthy bark; (*c*) quick canopy to kill the grass and reduce the fire risk. (*a*) and (*c*) can only be obtained by fairly close planting at the beginning, and the most effective distance would be 6 by 6 feet each way. This will form a perfect canopy at the end of the second season, and will also cause the early dropping of the side branches, and force up the stems into straightness. But we want solidity and thickness of bark also, and this we cannot get unless the stem diameter increases also. It is probable that 12 by 6 feet espacement will give the best yield of bark per acre, and in order to allow of a correct development it will be necessary to thin out every alternate line from the original spacing of 6 by 6 feet, say at the fourth year or so, to allow this process of stem and bark thickening to take place during the remaining four or five years.

If one of the objects is to produce Mine timber, as well as bark and firewood, the final espacement must be 12 by 12 feet, necessitating a second thinning in the sixth year, and allowing the balance of the plantation to remain standing for twelve years or thereabouts.



**The Western Walk, Botanic Gardens, Maritzburg. Lilies are *L. speciosum roseum*.**

## Preparation of Seed and Sowing.

Wattle seed has a very hard shell, and will not germinate readily without some preparation before sowing. The usual method is to pour *boiling* water on to the seed and allow it to stand until equally swollen and soft, say for a full day. Some planters go so far as to *boil* the seed for a few minutes. After swelling, the seed will be covered with a glutinous substance which causes it to stick together. To remove this it is washed in several waters, and then *planted at once*. Immediate planting is of great importance, for the soaking has commenced vigorous germination, and if the seed is, after this, allowed to dry out again, it will be of no use. The seed used should be all *of the same age*—not necessarily new seed, for it will hold its germination for many years—so that it swells equally and germinates together.

The sowing of the seed is hand work generally, although some few large planters have used the ordinary Mealie planter provided with a specially made disc. As a rule, however, an overseer lines out with long sticks. He is followed by two (or several two's) boys, the first of whom makes a shallow hole with a hoe, the second placing about a dozen seeds in the hole and covering it with his foot. The depth of the seed should not be more than half an inch.

It is important that lines should be straight, both for the sake of easy cultivation and the second crop.

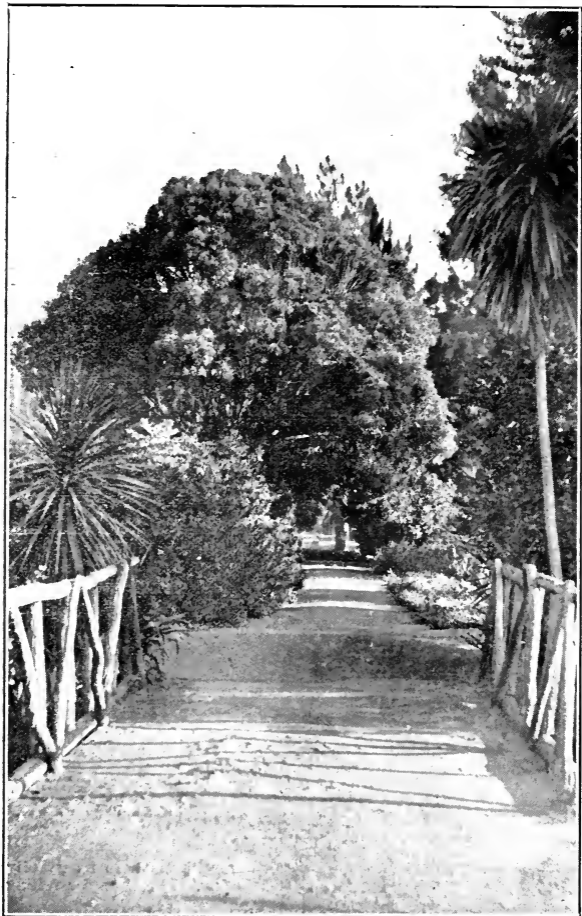
In fair weather the soaked seed will germinate in about a fortnight and will come up in little groups. These are thinned down to one when the height reaches about 18 inches as an average, the work being done by pulling out. Planters do not always leave the largest seedling, but rather try to arrange that the whole plantation should start at the same height and strength. If any filling in is necessary it should be done within three months of the first sowing.

## Cultivation.

In the average ground some harrow cultivation will be necessary towards the end of the first season. Some planters think this unnecessary in a new plantation, and, ignoring the annual weeds which die out in the Winter, simply send in a gang of boys with hoes to chop out the perennial grass tufts. Yet here, again, a good cultivation will materially assist growth by rain conservation, and the cost of the cultivation be well repaid later.

## General.

It is not possible, in the space at our disposal, to treat fully of felling, stripping, curing and marketing. The time for felling



**Rustic bridge leading to a grand specimen of Camphor Tree.**

will depend upon many factors, such as market values, demand for wood, season, &c. On the average a crop is ready for the market in from eight to ten years. Methods of stripping and curing change from year to year, and are likely to become more economical each year. As a rule, the stripping commences before the tree is felled, the boy ringing the bark as high as he can reach easily, and pulling downwards to the root. Then the tree is felled, and all bark taken off down to a branch diameter of 2 inches. Anything thinner than this is not worth taking. A trained boy should strip and hang half a ton of green bark in a day.

Large ventures have special drying sheds built, and, of course, expert men to operate. In small plantations it is usual to make racks 5 feet from the ground, using the stripped timber for the purpose, and to hang the bark over these, outside upwards, until dry. This process takes about a fortnight in good weather.\*

The important point in curing is to avoid heating and sweating, and to procure bark of a rich brown interior colour, and hard and brittle. Contact of the sticks during the drying process, or too much rain, will cause discolouration, and much reduce the value. A light shower does not do much harm, but some protection is necessary against continuous rain.

Bark from small plantations is generally sold in the "stick" to the miller or merchant, and by him it is chopped into half-inch or inch lengths, and bagged for shipment. The probable average yield of a plantation is 30 tons of wood and 4 tons of bark per acre. In an extra good plantation as much as 6 tons of bark may be obtained, with a proportionate increase in the quantity of wood.

Since the publication of our first edition, a great advance has been made in the extraction of "wattle extract" from green bark, and several local factories have been erected. No doubt many more will be erected, and this method, with its great saving of freight and drying of the bark, will entirely do away with the older methods.

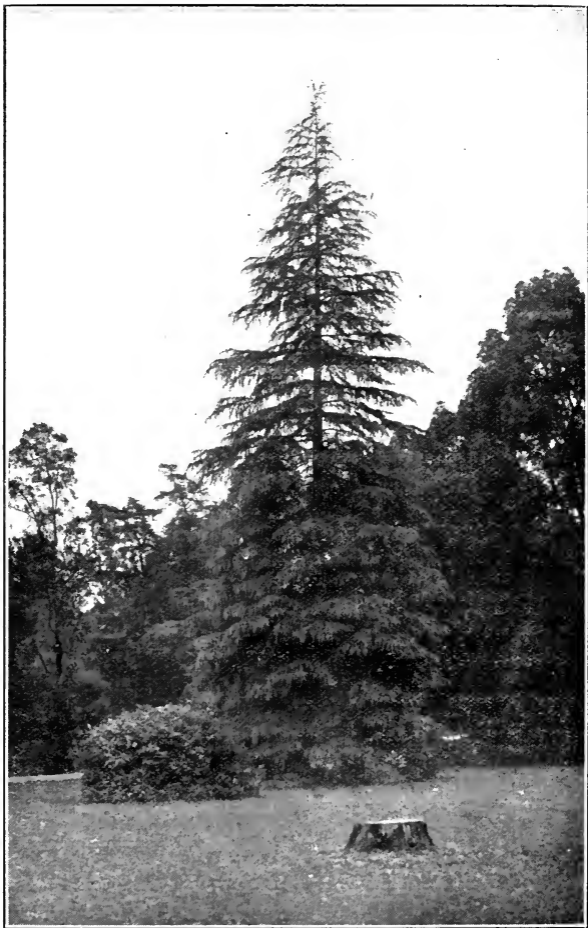
### Pests.

The two insect pests seriously attacking Wattles are commonly known as "Bagworms" and "Froghopper." The effects of the first is a complete defoliation, in a serious attack, and this frequently occurs in the year when stripping should take place, although not necessarily at that time. This defoliation stops the usual flow of sap and thus delays stripping until the attack is over and new leaf growth comes.

In the case of "Froghopper," the defoliation is not so complete, but this pest is probably the worse of the two. It occurs at a young stage, often in the second year. The insects eat away all the leading shoots, and cause the "leader" to "fork." When

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\*It is important that bark should not be suspended, for drying, over iron fences or wire.



***Cedrus deodara* in Botanic Gardens, Maritzburg.**



the attack is over it is often necessary to prune the trees to one leader again.

Practically no methods of extermination of these pests are known, but at the time of writing investigations are being undertaken by the Government which it is hoped will result in some practical preventive or other measures being adopted. In the case of "Bagworm" some growers hand pick the "Bags" from the younger trees when the infestation is light, thus probably preventing a rapid spread of the insects.

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CHAPTER IX.

ALPHABETICAL LIST OF UTILITY VARIETIES,  
WITH DESCRIPTION AND USES.

- (1) *Acacia dealbata* (Silver Wattle)—Frost resisting and the most reliable variety for firewood purposes at elevation of 5,000 feet and above.
- (2) *Acacia mollissima* (Black Wattle)—The commercial variety for bark, mine props, and firewood. Quick growth, only hardy to 10° of frost.
- (3) *Acacia normalis* (Green Wattle)—Closely resembling *A. mollissima*, but evidences a greater degree of resistance to frost. General uses the same.
- (4) *Acacia melanoxylon* (Blackwood)—On deep soil produces a magnificent timber, now used largely by wagon makers, and useful for many purposes. Wood very hard, splits well, and extremely durable. Highly recommended for extensive culture all over the country East of Drakensberg and in Transkei. Also ornamental.
- (5) *Acacia pycnantha* (Golden Wattle)—Richer in tannin than the *A. mollissima*, but not so good a yield. Tender to frost.
- (6) *Callitris robusta* (Australian Camphor Wood)—Rather slow growing, but a strong and useful timber. For dry districts and sandy soil.
- (7) *Casuarina quadrivalvis*  
*C. cunninghamii*  
*(C. tenuissima)*  
*C. leptoclada*

}	Quick growing and hardy. Timber of little use, but an excellent breakwind tree. Roots spreading.
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- (8) *Cedrus deodora*—A magnificent timber tree, and likely to do well at high elevations. Slow growing at first. Very handsome.



**A fine specimen of *Cupressus lusitanica*.**

- (9) *Ceratonia siliqua* (Carob)—A dry country tree, pods of which are useful cattle food. Prefers limestone soil. Will not transplant and seed must be sown where the trees are to grow.
- (10) *Cryptomeria japonica* (Japanese Cedar)—A very valuable and quick growing tree for fairly moist districts in Natal, O.F.S. and Transvaal. Very ornamental.
- (11) *Cupressus arizonica*—A recently introduced Cypress likely to do well at high elevations, and will stand drought. Very handsome, and good timber. Will stand dry conditions, and is an excellent hedge plant.
- (12) *Cupressus lusitanica* (Portuguese Cypress)—A very handsome and valuable timber tree, cedar-like of quick growth. Suitable for Eastern districts, and East O.F.S. and Transvaal. Will become very popular. Good windbreak. The sub-variety *glauca* is equally good and rather more spreading.
- (13) *Cupressus macrocarpa*—The favourite Cypress of South Africa, requires deep soil. Splendid shelter for stock, and windbreak. Not happy however to the east of Drakensberg, and *C. lusitanica* is better there.
- (14) *Cupressus sempervirens* (Common Cypress)—A good tree for dry districts and valuable timber. This, and the sub-variety "*horizontalis*" will prove useful for fencing poles and house timber. Seems to do well everywhere in good deep soil.
- (15) *Dalbergia sissoo* (Sissoo)—Wood ant resistant and good quality. Quick growing. Does well on all deep soils.
- (16) *Dodonea viscosa*—A good drought resistant shrub, largely used as a hedge plant and windbreak in India. Good in a wide range of climate. For warmer districts.
- (17) *Eucalyptus amygdalina*—Quick growing and straight trees, timber rather soft, but useful as a shelter belt in exposed situations. Fine mine-timber tree.
- (18) *Eucalyptus bicolor*—For dry districts. A good tree with valuable timber.
- (19) *Eucalyptus capitellata*—One of the best Gums for dry districts. Wood used for fence rails, shingles, and rough building.
- (20) *Eucalyptus corynocalyx* (Sugar Gum)—A good Gum for dry districts, and timber of medium value.
- (21) *Eucalyptus crebra*—One of the Ironbarks and suitable for cold and dry districts. Hardwood.
- (22) *Eucalyptus globulus* (Blue Gum)—Far more valuable than is generally known, and, well seasoned, gives excellent timber, equal to Oak. A heavy yielder, and of very quick growth. Tender to frost.
- (23) *Eucalyptus gunii* (Gun's Gum)—Frost resistant. Timber second rate, but one of the best shelter trees for O.F.S.



***Juniperus virginiana.* Azaleas in foreground.**

- (24) *Eucalyptus leucoxyton*—Good and heavy wood. Suitable for hot and dry districts.
- (25) *Eucalyptus macrorrhynca* (Stringy Bark)—One of the useful timbers. Does well in stony soils with deep subsoil. Drought resistant.\*
- (25A) *Eucalyptus maidenii*—Promises very well from Midlands to High Veld. Timber good for many purposes.
- (26) *Eucalyptus maculata* (Spotted Gum)—This timber is largely imported by wagon makers. For warm districts.
- (27) *Eucalyptus melliodora*—This is doing well in O.F.S., and said to be suitable for shale soils. Timber first class and valuable.
- (28) *Eucalyptus paniculata* (Ironbark)—Perhaps the best of the hardwoods for South Africa. Makes good sleepers, quick growing. For warm districts only.
- (29) *Eucalyptus pilularis* (Flintwood)—Very hardy and durable timber, and yet quick growing in warm districts.
- (30) *Eucalyptus punctata* (Leather Jacket)—A handsome tree, fair timber, and of quick growth. Suitable for districts with good rainfall only.
- (31) *Eucalyptus resinifera*—Wood similar to Jarrah, very valuable. Rather slow of growth.
- (32) *Eucalyptus robusta*—Suitable for Natal and East Griqualand. Fair timber.
- (33) *Eucalyptus rostrata*—A valuable and very durable wood, and of all Gums the best adapted for general growth over the whole of the Eastern Provinces. Stands cold and drought well.
- (34) *Eucalyptus saligna*—This has proved one of the best Gums in the Natal Midlands and similar situations. Timber good, and used for building, sleepers, furniture, and boxes. Good rainfall necessary. One of the best mine timber gums.
- (35) *Eucalyptus siderophloia* (Ironbark)—Again for the Midlands districts. Timber very valuable and durable. Slow growing.
- (36) *Eucalyptus sideroxyton* (Red Ironbark)—Suitable for cold, dry, and rocky districts, and shallow soils. Timber first class.
- (37) *Eucalyptus stuartiana*—Second-rate timber, but quick growing, and doing well in many cold and exposed places. Particularly good in O.F.S.
- (38) *Eucalyptus tereticornus*—A variety of *robusta*, but a much better timber, and more hardy.
- (39) *Eucalyptus viminalis* (Willow Gum)—The favourite tree for O.F.S. and colder parts of the Transvaal. A poor timber, but of good and quick growth, and stands frost well.

\*Requires very close espacement to force straight growth.



Hickory and *Ficus elastica*. Botanic Gardens, Maritzburg.

- (40) *Grevillea robusta* (Silky Oak)—This tree is proving of great value in Natal, both for furniture and in wagon building. It is very handsome, of quick growth, and does remarkably well in Natal Midlands. Will not stand more than 6° of frost. Highly recommended for the warmer districts.
- (41) *Juniperus virginiana* (Pencil Cedar)—Of the two Junipers of commerce this is the better one, being quicker of growth and standing inland conditions better. All Junipers, however, are of slow growth. A beautiful, scented timber. Suitable even on the coast littoral, and seldom touched by white ants.
- (42) *Pinus canariensis* (Canary Island Pine)—Seems to do well over a very wide range of country, particularly in mountainous districts. The timber is the best of all the common Pines.
- (43) *Pinus halepensis* (Aleppo Pine)—An exceedingly hardy inland Pine, standing drought and frost well. A good timber tree, and handsome.
- (44) *Pinus insignis*—A large, handsome and quick-growing Pine, thriving all round the Eastern Provinces of South Africa, and well to the West of the Drakensberg. Timber always in demand, and ready in from 20 to 25 years.
- (45) *Pinus pinaster* (Cluster Pine)—This and *P. pinea* are the varieties so plentiful in the Cape Peninsula. Very hardy, very quick in growth for a pine, and first-class timber. Often sown broadcast in large areas.
- (46) *Pinus thunbergii* (Japanese Cluster Pine)—As hardy as the pinaster, and does well in similar country.
- (47) *Schinus molle* (Pepper Tree)—A useful and very handy shelter tree, and quite handsome. Timber valueless.

DECIDUOUS TYPES.—Of this class very few are likely to be planted for utility. Others will be found under Ornamental types.

*Cedrella toona* (Indian Mahogany)—A good and easily worked timber. This tree is doing remarkably well near Maritzburg out of the frost zone. Growth very rapid. A handsome avenue or specimen tree.

*Fraxinus americana* (American Ash)—Quite at home in South Africa, but requires good alluvial soil. Slow growing. Timber large and very good.

*Fraxinus excelsior* var. *Kabyllia* (Algerian Ash)—Probably the best Ash for South Africa, particularly in cool mountain districts.

*Populus alba*—A useful Poplar for planting in "Dongas" and on banks to prevent erosion. Value of timber well known.

*Populus monilifera*, a tall and good tree, quick of growth and suckers. Splendid matchwood.

*Populus macrophylla*: another excellent timber tree for the above purpose, and also very handsome as a specimen. Leaves extra large.

*Robinia pseudo-acacia*—Needs good soil, preferably lime, and a cold winter. Good fencing poles.

*Salix babylonica* (Weeping Willow)—A good, useful and light timber.

(48) *Taxodium distichum* (Swamp Cypress)—A valuable timber tree, but only suitable for rich soil on river banks. Handsome, deciduous.

### Table of Number of Trees required per Acre at Certain Distances Apart.

5 × 5 feet	..	..	..	..	1,742
6 × 6 "	..	..	..	..	1,210
7 × 7 "	..	..	..	..	889
8 × 8 "	..	..	..	..	680
10 × 10 "	..	..	..	..	435
12 × 12 "	..	..	..	..	302
6 × 12 "	..	..	..	..	605
8 × 12 "	..	..	..	..	474

When purchasing or growing transplants, an allowance of 5 per cent. should be made for probable failures.



## Section II.

## CHAPTER X.

## ABOUT HEDGES AND BORDER PLANTS.

THERE are more badly-grown hedges in South Africa, in proportion to its white population, than in any other country occupied by Europeans. Heaven knows there are plenty of such failures in all countries, but here there must be something grievously wrong somewhere. One does not, of course, expect to find fine old Yew or Juniper fences, which have been cared for by trained gardeners for centuries; but surely one may reasonably expect fulness and symmetry and health in the younger hedges of this young country.

Let us give one or two reasons for the failure, and then perhaps we may find out how to succeed. Most people want to create a hedge in just a year, or two years, and to this end very quick growing plants are purchased, as big as they can be got. Some, again, choose trees which are entirely unsuited to the locality or soil. Some folk are like Spring poets, full of longing and with ideals of magnificent green hedges just when the first Spring rains fall and the buds appear. They plant—and that is all. Once planted a hedge is expected to take care of itself. But it won't!

Then some hedges are in the wrong place. To plant in order to shut out the view of your pretty garden from the man in the street is selfish. To plant a hedge within a few feet of a flower bed is disastrous to the flowers, and yet some front gardens are so small that there is no room for both.

*The place for a hedge* is (a) Around the vegetable garden, to screen off the formality of this utility spot from the rest of the grounds, and to keep out dogs and high winds. (b) To act as a screen between town lots, on the left and right of the house, for the sake of privacy. (c) To screen off the washing and drying ground, or any other necessary and inartistic place about the home, and (d) To define low boundaries to paths and sections of the garden.

Note the omissions from popular ideas. There is to be no hedge on the street boundary—let your flowers be enjoyed by the passers-by. No hedge on the sides of the carriage drive—there should be grass and shrubbery there.



*Cupressus lawsoniana erecta.*

HOW TO PLANT A HEDGE.—The preparation of the ground is of great importance and worth time. We believe in digging over a trench *two feet wide* and *two feet deep* and having the contents thoroughly well pulverised. If the ground is really poor, the addition of 5 lbs. of Bone Dust to every 10 feet will be of benefit to the plants. On no account use kraal or stable manure, and where the land is good it is unnecessary to use manure of any kind. In trenching, leave the subsoil where you found it—at the bottom—so that the feeding roots will have the best soil to start with. When the trench is dug the soil should be filled in again, and firmed down well. The distance to allow between the plants depends largely upon the type of tree which is going in. Some of the spreading Cypresses will be right at 18 inches apart, but for the more upright growers it is best to plant a foot or 15 inches apart. All species should be planted at the same *depth* as they were in the Nursery tins or lines.

COMPACTNESS—FULLNESS.—This is the point to be aimed at. To get this is largely a question of time and careful trimming. But the first necessity is to carefully choose the right plants. Seedling plants, or rooted cuttings, will vary somewhat in quality when you have grown them, or when you get them from the nursery. It may be necessary, in order to get an *equal* stand, of equal strength and vigour, to discard some as quite useless. If one or two plants are smaller than the rest of the line at the beginning *they will never catch up*. They are what we call *dominated* by the larger ones, robbed of light and food by the more vigorous plants—they are unfit. It is far best to discard them, throw them away, and plant only those of equal height and strength.

PUT IN SMALLER PLANTS.—Those which have been transplanted several times, or which have been moved from tin to tin, have probably sustained some loss of vigour, or have lost some of their lower branches. The smaller plants in good ground and with care, will always make the best fence eventually.

PRUNE BACK RIGHT WAY.—It seems hard to cut away the young vigorous top growth of any tree, we know. But remember that is necessary for your hedge to be *full at the base*. This fullness can only be made by trimming immediately the hedge is put in and keeping this up until you are satisfied that a good foundation is laid—broad and compact. Once this base is made the hedge is safe.

THE SHAPE OF A HEDGE should be the shape of a naturally grown tree, broad at the base and gradually narrowing toward the top. A square hedge is hideous, and a round hedge is very little better. Hedges should not be trimmed too closely. A little irregularity is quite a natural and beautiful thing.



Three types of hedges—The front one is *Cotoneaster franchettei*, 2nd: running parallel is *Calliseric cupressoides*, Outer hedge: *Berg Cyprus*, Background: *Casuarina tenuissimum*.

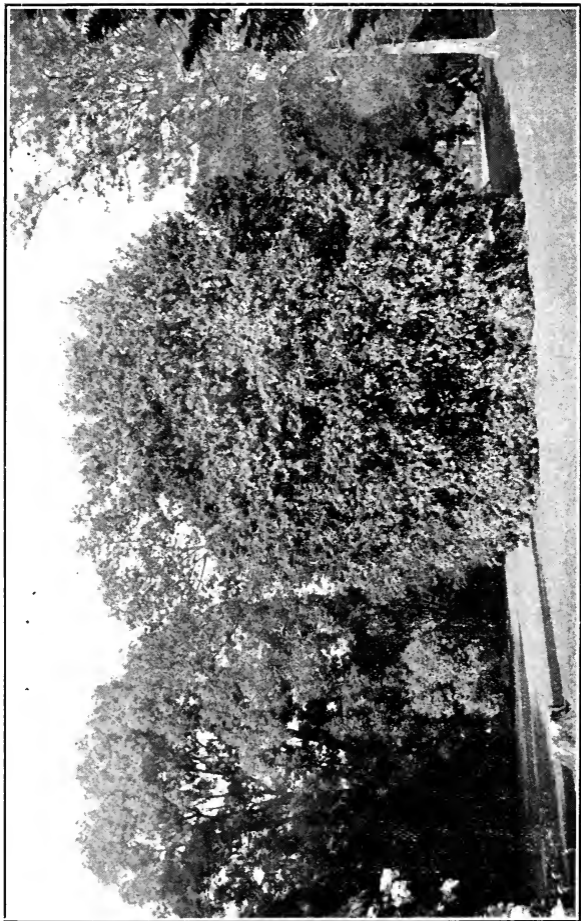
### Choice of Trees.

The schedule following this chapter gives a long list of plants which are commonly used as hedge plants, and all of which are more or less successful in certain districts. But to choose properly one needs to consider carefully what the hedge is wanted for and what the position is like. One point worthy of consideration is the *root system*. Thus we often see Japanese Privet planted round very small vegetable or flower gardens in towns, yet this plant is the grossest feeder, and has the most spreading roots of all the hedge plants mentioned. It will suck out the moisture and nourishment from the ground for a distance of at least 12 feet away from its branches, the rootlets to that distance being almost a solid mass of fine fibres. It is the most popular of all hedges because of its quick growth. But this is its only virtue. For town use where gardens are so small, it should be avoided like poison. In such positions it not only robs all other plants, but becomes quickly infested with Red Scale. Where there is plenty of room it is much better and healthier, but a fair comparison of values we should place it almost at the bottom of the list.

At the top of the value list we should always place Juniper (*J. virginiana*), and this in practically all districts. It is of rather slow growth, but is hardy, very compact, never dies out in sections, and will last a life time. Of the Cypresses, the best is *C. lusitana*, or its sub-variety, *glauca*. *C. arizonica* has proved a magnificent hedge plant in all districts, compact and permanent. *C. macrocarpa* is good on the high veld, but fails in Midland and Coast belts. Eugenias are very fine in the warmer districts, particularly *E. braziliensis* and *E. eucalyptoides*. *Thuja compacta* (*T. orientalis nana*) is excellent almost in all districts if well trimmed and cared for, but soon spoils under brief neglect.

**DWARF BORDERS.**—For the vegetable garden, to define large beds, and are extremely useful, particularly where the garden is on a slope and the soil apt to wash away during the heavy storms. In putting these down it is necessary to plant out the plants at a very small and young stage, and to space 6 to 9 inches apart.

A host of species may be used for this purpose for temporary purposes, but for *permanent* work the choice is but a small one. One of the neatest small borders we have is made of *Cupressus arizonica*. It is now three years old and only a foot high. The plants were put in when only 3 inches high 6 inches apart, and were pinched at once. *Thuja compacta* makes an excellent 2-foot border, while common Box can be kept at a foot for many years. But it is subject to attacks of American blight, and is often killed out by this disease. The *Alternantheras* are, unfortunately, tender, and while suitable for warm, frostless districts, would Winter kill every year on the high veldt.



A specimen *Eugenia eucalyptoides*.

## CHAPTER XI.

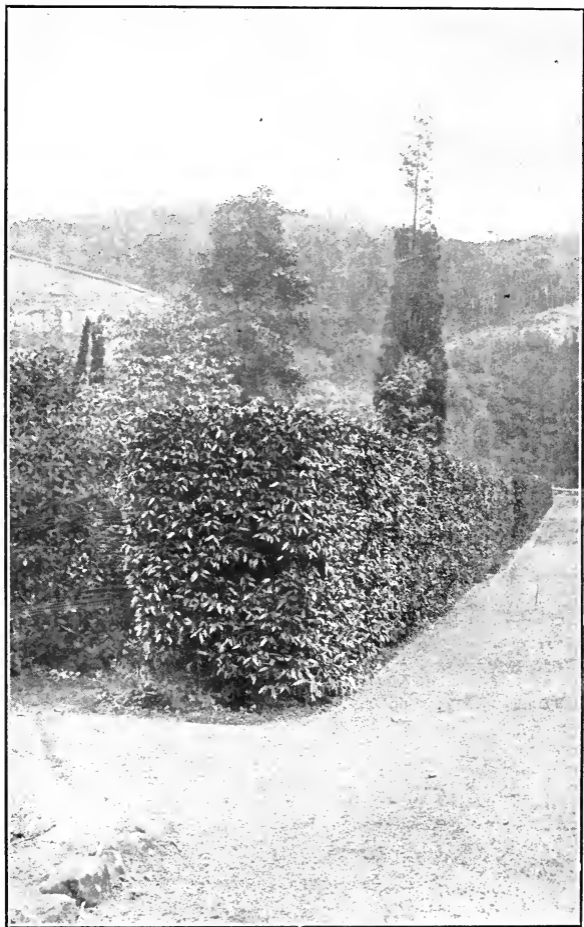
## SCHEDULE OF HEDGE AND BORDER PLANTS.

## Plants for Edging Garden Beds.

- Alternanthera*—Delicate to frost, only standing 3°; can be saved by cuttings or root divisions in cold districts. Plant 6 inches apart.
- Berberis vulgaris* (Common Barberry)—1 foot, Spring clipping necessary. Evergreen. Very hardy.
- Euphorbia splendens* (Christ Thorn)—Numerous scarlet flowers, quite impenetrable and easy to grow.
- Buxus sempervirens* (Box)—Not very satisfactory. Subject to Red Scale and Dorthesia, which makes gaps after a time. Best in cold districts.
- Cupressus arizonica*—Very compact, bluish green. Plant 9 inches apart.
- Juniperus communis*—Dark green, compact. Good for many years.
- Spiraea callosa* and *S. C. Anthony Waterer*—Delicate and fairly compact growth. Milk white and crimson flower heads of great beauty.
- Thuja compacta*—Dark fern-like foliage. Keeps dwarf for a long time. Plant 9 inches apart when 3 inches high.

## Plants for Hedges, from 3 to 15 feet.

- Abelia floribunda*—One of the best of the flowering hedge plants, and, if well trimmed, will be quite compact and good.
- Aberia caffra* (Kei Apple)—A rough, impenetrable and thorny hedge, to turn cattle; more useful than beautiful; 4 to 10 feet.
- Bambusa fortunei* (Dwarf Bamboo)—A handsome and effective hedge for the Coast, warm Midlands, and mist belt; quick growing. Should be planted with a wire fence running through it; 4 to 5 feet.
- Brunfelsia eximia*—This is a most beautiful shrub, with purple flowers in great profusion, and in hedge form is very compact and good; 4 to 6 feet.



Hedge of *Eugenia eucalyptoides*.



- Callitris cupressiformis* (Oyster Bay Pine, *C. rhomboidea*)—A compact hedge of dark green. Needs constant trimming. In some districts odd trees are apt to die out and leave a gap; 3 to 6 feet.
- Callitris robusta*—Rough and perhaps more useful than Oyster Bay, light of colour, does not die out readily; 3 to 8 feet.
- Cupressus* of various sorts make excellent hedges. The best are *C. lusitanica glauca*, a light glaucous green; *C. macrocarpa*, dark, not so good in Midlands, but doing well on high veld; *C. arizonica*, a light green type, of compact habit and hardy against drought; *C. pyramidalis*, useful planted closely where a high and narrow fence is required; *C. lawsoniana*, a rich mid-green, very graceful habit indeed; 3 to 10 feet.
- Eugenia eucalyptoides*—A very fine shining green, excellent for a solid and thick break, trims well; 4 to 10 feet.
- Eugenia myrtifolia*—More compact and smaller leaved than the former and suitable for dwarfer hedges. Fruit edible.
- Juniperus virginiana*—Probably the best of all hedge plants, compact and dense, and seldom seen with gaps. It is of slow growth, but very long life. Good all over; 3 to 8 feet.
- Carissa grandiflora* (Amatungula)—Absolutely at home near the sea, and for a good distance inland, but of doubtful utility in Transvaal and O.F.S. The deep evergreen foliage, and thorny nature, make it an ideal hedge where it will do well. Slow growing; 4 to 8 feet.
- Ligustrum japonicum* (Japanese Privet)—A quick-growing and practically evergreen hedge for most districts, but should never be planted in a small garden owing to its voracious and spreading root system. The roots will spread many feet and rob the soil of all nourishment. In the Natal Midlands subject to attacks of "stem-borer" and Red Scale. Very popular, but a third-rate hedge plant; 4 to 12 feet.
- Ligustrum sinensis nana*—Foliage and general habit smaller and more compact than the former, and not such a robber. More easily kept in trim; 3 to 5 feet.
- Leptospermum laevigatum* (Australia Myrtle)—Makes a useful grey-green hedge of quick growth, and is very popular in some parts of the Cape. Subject to Ross Scale. 4 to 5 feet.
- Spiraea reevesii* (Double-flowering Cape May)—Deciduous but very beautiful when the pure white flowers are out in the early Spring. Should not be trimmed after the New Year if to flower freely; 3 to 4 feet.
- Pomegranate* (*Punica granatum*)—This is generally seen spoilt for want of regular pruning, but, if well cut from the beginning, makes a most compact and effective hedge. The orange flowers are plentiful in Spring. Foliage a rich shining green; 4 to 10 feet.
- Privet, Golden*—A very beautiful 3 feet hedge when exposed to the full sunlight. Vigorous. Foliage oval, green bordered yellow.

*Thuja compacta* (Arbor Vitæ)—Very deep green, fern-like foliage, and of compact growth. This is rather slow growing, and suitable for a dwarf hedge of 3 feet high. Trims well.

*Tecoma capensis*—Suitable for a good flowering hedge in the warmer districts; 6 feet.

*Quick screens* may also be made of White Mulberry, some of the climbing plants on trellis, *Tecoma capensis*, *Dodonia viscosa*, Pepper trees, calophor, &c.

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## Section III.

## CHAPTER XII.

## ORNAMENTAL TREES AND SHRUBS.

WHEN planting shrubberies and general ornamental trees, we put aside all idea of utility, and consider *pictorial effect only*. We want the home, the house, the grounds, to be one complete picture; and if the place is large enough, we want to create a series of pictures, making every nook and corner, every broad and every confined view, a place of beauty. To say that the planting of trees will do this is only partially correct. For planting without a well-planned scheme, without the completed picture in one's mind, and without tasteful selection of variety and place, may end in a hopeless failure. Methods of ground preparation, distances, formation—almost all points one could mention are to be viewed from a standpoint quite different from the putting down of a mere plantation of trees. Let us consider some of the general principles to be followed:

- (a) Before the ground is touched or a tree purchased the owner should have a *clear picture of what he wants*. The general failure of a good many homesteads is not caused by a lack of trees and shrubs, but by a lack of ideal. Things have been planted without any fixed plan in view, and the result is a hopeless, inartistic tangle of foliage. *Get the plan of the place fixed in the imagination*, just as an architect completes his plans before building a house.

This *plan of the place* is not to be what it will look like when planted, but *what you think it will be, in ten, twenty, or thirty years' time*. It requires imagination to think forward to the time when your seedlings will have become grown up, some of them large and handsome spreading trees, or masses of grand varied foliage, or well-grown shrubs in full flower and leaf. Yet success in planting depends on a clear picture just like that. It may be that you desire to copy some place you have seen, or create a replica of some natural beauty spot. Or there may be some new and attractive ideas to be worked out. Whatever it is, *let it be a clear and complete picture*.

- (b) In this picture there are no straight lines or sharp angles; no straight drives or walks if they can be avoided; no great masses of a single species of tree, although *groups* of one species are allowable. Nature has no right angles in her make-up, and only rarely does one find amassed pure species in one place. Curves and graceful irregularities, variety in colour, light and shade; these are the primal foundations of Nature's beauty spots. *Our* beauty spot, *the home*, should be made on like foundations.
- (c) *Aim for diversity of colour and shape of foliage.*—This is of far greater importance than floral effects. Flowers are brief and soon gone. Foliage may be a joy all the year round. The colours of flowers may easily clash and glare. But the various shades of green, the bronzes, reds, browns, and greys of healthy trees never clash. The variations in green alone, say in a group of Pines or Cypresses of different varieties, is wonderful. And what possible mass of even the most brilliant flowers can hope to compare with the autumn tints of Virginian Creeper, *Rhus glabra*, *Cryptomeria elegans*, the common Oak and other deciduous types, the rich effect of the berried mountain ash or "Fire Thorn"; these and not our flowers, give us the most perfect and delicate art-tones of Nature, ranging from the Pine needle to the Plantain; from the graceful drooping Weeping Willow to the erect Poplar; from the sweep of *Bauhinia galpini* to the stately Deodar.
- (d) *Avoid shearing and pruning.*—These are only allowable in the *utility* grounds. Occasionally a branch may have to be lopped off because of storm and tempest. Sometimes the early growth of a shrub or tree may be improved by removing a double leader. But, generally speaking, if the trees have been chosen well and are well planted, they will grow beautifully without any help from us. Pruned trees, or those cut into fancy figures and shapes, are an abomination and an eyesore.
- (e) *The more delicate species*—those which actually belong to warmer climate or easier conditions—should be placed in well considered positions, warm nooks and corners, with shelter from the cold winds of Winter or the hot winds of early Spring. Even among the larger trees there are some species which are all the better for shelter, such as *Grevillea robusta*, which breaks readily if exposed to storm winds. In the colder districts, many of the sub-tropical plants will thrive if the climate is modified for them by the provision of shelter from winds.

In choosing positions to suit the more delicate species, it is well to remember that hollows in the land are cold spots; that a hillside is generally warm; that the worst frost effect is felt just where the rising sun first strikes. At Johannesburg and Harrismith one can find such plants as *Petræas*,

Lasiandras, Bougainvilleas, and Hibiscus doing well—but only on North and North East aspects, with shelter behind them. It is false reasoning to say that because a plant frosts off at Maritzburg it will not live on the colder high veld. The young shoots are much more succulent and tender in warmer districts, while they may ripen better, and thus become much harder, in a less hurried and colder climate. The Jacaranda needs careful protection at Maritzburg on the low-lying land. But at Johannesburg it becomes hardy and *deciduous*. The frost effect is not nearly so deadly as the dry and cold winds of Winter, which kill tender plants by evaporation and dessication.

- (f) *The variety of trees chosen* will depend upon the area of the ground available. In a small town lot, large trees would be ridiculous, and only small growing kinds of trees and shrubs, of a fairly compact type, should be planted. At the other extreme we may have large grounds available, room enough for all, with lawns, glades, groups, masses, and even a pond or lake.
- (g) When planting, carefully note the height to which the tree will eventually grow, and its probable branch diameter. We must not only avoid overcrowding, which always ruins the shape of trees, but must also see that tall types are not put in front of dwarf types.
- (h) *Single specimens*.—For lawns and grass glades, and avenues, trees also, should be very carefully chosen. Each should be a *perfect young tree*, with *no visible faults*. In the case of Cypresses, Pines, Cedars, &c., a very important point is to see that the lower branches are perfect, for a specimen Cypress should show practically no stem at all—the lower branches should sweep down to the grass or gravel.
- (i) The ground for a shrubbery, and the place for a specimen should be *bastard trenched* before the trees are planted. That is, the first foot of soil should be well pulverised, and *the next six inches loosened up*. The mere digging of a good-sized hole is not allowable—a hole is nearly always a death trap for the tree. Don't scamp the work at the very beginning. You are planting for a lifetime, remember, and the perfect growth of trees and shrubs is only possible when the ground has been well prepared.

## CHAPTER XIII.

ALPHABETICAL LIST OF ORNAMENTAL TREES  
AND SHRUBS, WITH SHORT DESCRIPTIONS.

Species marked \* are hardy and suitable for elevations of 5-6000 feet with up to 20° of frost.

\**Abelia rupestris*—Already mentioned as a hedge plant, but also a good and hardy specimen shrub. Flowers numerous and continuous. Pink, tubular; 6 feet.

*A. floribunda* is dwarfier, with tubular, rose purple, pendulous flowers. 4 feet.

\**Abies morinda* (*A. Smithii*)—A grand Conifer, suitable for the colder districts only, with good rainfall. Of slow growth. The young needles as they come out in the Spring are bright green, and look very beautiful against the background of old and dark foliage; 50 feet. Many other types of *Abies* might be found useful in moist and elevated districts.

*Abutilons*—Of many varieties. Perhaps the species *A. chinensis*, *A. venosum*, *A. thompsonii* (leaves green and gold, with double flowers), and the named pure white "Boule de Nieve," are best. The range of height is from 4 to 8 feet. Flowers yellow, white, rose, and mostly beautifully veined; pendulous. A plant for all gardens.

\**Acacia baileyana*—The foliage of this Wattle is very pale grey-green, and of very handsome appearance, whilst the yellow flowers are borne in profuse masses in early Spring. Hardy at 5,000 feet; 30 feet.

\**Acacia cultriformis*—Another handsome, pale green, ornamental *Acacia*, of real merit for garden decoration. Floriferous; 25 feet.

NOTE.—Nearly all the *Acacias* are highly ornamental when grown as single specimens, but they should be used sparingly on account of the great drain they make on the soil-moisture for a great distance from the stems. *Acacia spectabilis* and *A. riceana* are particularly beautiful types.

*Acacia melanoxylon*—A large tree, to 80 feet, with magnificent dark-green entire foliage. A grand specimen tree, but perhaps best in groups for pastures and parks.

*Acalypha*—The various species are almost confined to warm Mid-lands and Coast culture as they will not bear the least cold or frost. The varieties are numerous, leaves variegated with brown, yellow, and green and very handsome. *A. sanderiana* has long pendulous racemes of scarlet flowers. Height from 4 to 6 feet.

\**Acers* (Maples)—Of the various species of Maples, perhaps only the Box Elder (*A. negundo*) can be said to be successful anywhere in South Africa, and even this seldom seems happy away from water, or at least a district of heavy rainfall. The Sycamore (*A. pseudo-platanus*) is of slow growth. This, and the Plane, may be of use, however, as specimen deciduous trees where there is deep soil. For avenues the branch spread is large and heavy, while there is the particularly beautiful effect of the bright green new foliage each Spring. Other varieties which might do in selected spots are the Norway Maple (*A. platanoides*), the Sugar Maple (*A. saccharinum*), and the Red-leaved Maple (*A. rubrum*), the leaves of which turn a brilliant red in Autumn. Height from 40 to 60 feet.

*Ailanthus glandulosa*—Highly ornamental foliage whilst the tree is young, with broad pinnate leaves. But we cannot recommend it for general planting in South Africa, because of its habit of suckering. As it gets older its beauty fades. 20 feet.

*Alamandas*—All are vigorous, quick growing shrubs, from 8 to 16 feet in height, and very bushy. *A. nerifolia* is always in flower, the flowers being yellow bells about 2 inches long. *A. schottii* (*A. magnifica*) bears a much larger yellow flower of the same shape, slightly darker yellow, but is not such a continuous bloomer. It is a drooping plant. *A. violacea* has numerous and large violet flowers, bell-shaped and pendulous, while the habit of the plant is more of a trailer than a stiff shrub. All fairly hardy and well worth growing.

\**Alnus*—Both *A. alba* and *A. glutinosa* are large trees, at home on the banks of a stream. Deciduous. 50 feet.

\**Aloysia citriodora*—The "Lemon-scented Verbena." Vigorous, quick growing and hardy. The flowers are quite insignificant, but the plentiful foliage is strongly scented with lemon. 6 feet.

*Alstonia scholaris*—5 feet. A fine evergreen shrub, with very numerous white star-shaped flowers, quite useful for cutting. Hardy up to 3,000 feet.

\**Althaea frutex* (Syrian Hibiscus)—The Althaeas are highly desirable for planting in cold districts, although they also do quite well in warmer places. They are very hardy, deciduous, and in October and November are covered with single and double flowers, rose purple and white, the individual flowers being 2 to 3 inches across. 6 to 10 feet.



*Acacia baileyana.*



\**Amygdalus persica* (Peach)—The double-flowering Peaches are amongst the finest of our shrubs for early Spring flowers. While the trees are still almost leafless, the branches break out with abundance of rose, white, or red rosettes; a perfect blaze of delicate colour. 10 to 20 feet. We might note here that all the shrubs bearing flowers in very early Spring will do much better if irrigated in July.

\**Apple*, Flowering—See *Malus*.

\**Aralia* (*Fatsia*) *papyrifera*—A weed in one sense, for once planted it is difficult to keep within bounds. The young suckers come up at long distances from the parent. Yet it is a very handsome foliage plant, with enormous, palmate, dull green leaves, sometimes 2 feet across; and the masses of inflorescence, a creamy yellow cloud, are also handsome. To be planted where room is plentiful, and where it cannot interfere with other plants. 8 feet.

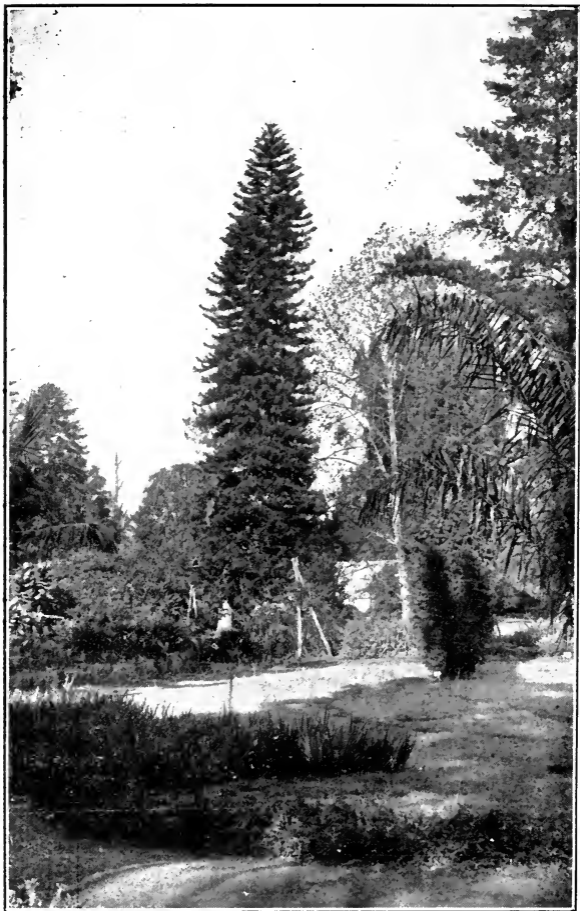
*Araucarias*—Most of these yield a very excellent timber, but have not been mentioned in that connection because they are of very slow growth for that purpose. But as ornamental trees the four or five species we know in South Africa are magnificent. For the Coast belt and warm Midlands, *A. excelsa* (Norfolk Island Pine) and *A. cookii* (Capt. Cook's Pine) are unequalled by any tree for symmetry and stateliness, but they are not suitable for cold districts, their cold limit being about 6° of frost. *A. cunninghamii* is also subject to harm from frost. *A. imbricata*\* (Monkey Puzzle) and *A. brazilensis*\*, both highly ornamental, are more hardy, and both are living and thriving at Harrismith. For ornament *Araucarias* are best planted as single specimens, allowing plenty of room for full development. Height, 60 to 120 feet.

*Asimina triloba*—A small tree, 20 feet. The large pulpy fruit is edible and of pleasant taste when fully ripe.

\**Aucuba japonica*—Purely a foliage plant, and most popular in Europe. The large leaves are mottled and splashed yellow, and are thick, leathery and shining. In districts of good rainfall, and with partial shade, this handsome shrub will do well, and is quite hardy; but exposure to full sunlight, or hot winds, scorch and spoil the leaves and stop growth. 6 to 10 feet.

*Azalea indica* (Evergreen Azaleas)—So well-known that any description is unnecessary. The most beautiful and effective of all flowering shrubs for South Africa, and hardy to 15° of frost. Flowers are many colours, and these appear from the end of June (in the warm districts) to the end of October. Colours from white through all shades of red, almost to purple.

The double-flowering type is of much slower and dwarfer growth than the single-flowering type, the plants rarely exceeding 6 feet in height. If Azaleas, therefore, are required for a large shrubbery or long carriage drive, it is best to



Central specimen tree, *Araucaria cookii*. Cape bulbs bedded  
in the foreground.

plant the single-flowering type, which is just as good for scenic effect as the dwarfer, double-flowering kinds. During a prolonged drought young Azaleas will need water, the root system being shallow and compact. Later the roots ramify more and become independent of surface conditions.

\**Azalea mollis*—These are deciduous, and throw out the masses of bloom before the leaves appear. Colours are mostly yellow grounds, but there are several shades of salmon and pink which are very delicate and beautiful. Height, 6 feet.

\**Bamboos*—The various species of Bamboo are exceedingly ornamental and give a tropical effect to a shrubbery. While living and growing on dry land, they all prefer humid atmosphere and moist soil, and luxuriate there. The small *B. fortunei* has already been mentioned as a hedge plant, but it also makes a dainty and graceful specimen shrub, as indeed do all members of the family. A natural position is on small islands, or borders of streams and ponds, and they should stand well out from other types of shrubs and trees. Height ranges from 8 to 100 feet.

*Bauhinias*—Several varieties are well known in South Africa, including *B. acuminata*, *B. purpurea*, *B. natalensis*, and *B. galpini*. The two first-named are rather ungainly trees of awkward spread, but bear handsome white and purple flowers. *B. natalensis* is a dwarf and slow growing shrub. The one recommended for shrubbery planting is *B. galpini*. It has graceful drooping branch habit, curious two-lobed leaves, and in November and December great masses of scarlet flowers which cover the whole shrub. It is a foreground plant to sweep right down to the grass border.

*Belthambra* (*Phytolacca dioica*)—A tall growing heavy foliaged shade tree, perhaps suitable for thorn country where other trees will not do well. Quick of growth and the tree soon reaches a height of some 40 feet. Wood soft and valueless—a shade tree only.

\**Benthamia fragifera*—An evergreen shrub reaching to a height of about 10 feet, and covered in Autumn with multitudes of scarlet strawberry-like fruits. Handsome and hardy.

\**Berberis*—The various species of Barberry are mostly grown for Autumn and Winter foliage effect, and many of them are at that season delightful with scarlet berries and ruddy foliage. Leaves are holly-like and prickly, and most of the stems are also armed with little clusters of spikes. The best are *B. vulgaris*, *B. sieboldii*, *B. darwinii*, *B. jamesonii*, and *B. thunbergii*. Height, 5 to 6 feet. *B. vulgaris* is often used as a hedge plant, and is almost evergreen. Other kinds are deciduous, or nearly so.

\**Betula* (Birch)—The Birch cannot be recommended for South Africa. Even under the best conditions it seems unhappy.

*Bougainvilleas*—All the varieties known in South Africa are vigorous ramblers if allowed to go, but when kept in bush form, as single specimens, and allowed to droop on to the grass at will, all are effective, and in the warmer districts, or where there is good shelter, are very free bloomers. *B. glabra* is a rich blue purple, *B. braziliensis* ranges from scarlet to brick red, varying with soils. *B. splendens* is magenta, and *B. sanderiana* a pale magenta. The two first are the most desirable. This plant is sometimes used to climb up an old tree stump, and we know of some plants which have climbed fully 60 feet and form most brilliant festoons of bloom in late Winter and up to Christmas. A frost of 10° will cut them a little.

*Bouvardias* are for warm districts only, for they will not stand any frost or cold winds. Curiously enough they are not successful on the South African Coast, and seem to prefer the drier atmosphere of warm Midlands. The flowers are borne on the ends of young shoots, and are flat corymbs of stars, white, yellow, pink, and red, of great beauty. The plants are almost too delicate for the shrubbery, and are better fitted for a perennial border. 4 to 6 feet.

\**Broom* (*Genista*)—The yellow flowering "Spanish" and "English" Brooms are well known, and useful shrubs, vigorous everywhere. *G. andreana* and *G. præcox* are a little more delicate, and of smaller growth, with darker spots on the flowers. The white Portugal Broom bears pure white flowers in great profusion, and is well worth a place in the shrubbery foreground for floral effect, as well as being a good large rockery plant. Height 4 to 10 feet.

*Brugmansia knightii* (Moonflower)—Suitable for Coast and warm districts only, as a 10° frost will kill it down. However, it revives rapidly from this effect, sending up strong shoots very quickly from the base again. The flowers are very large, pendulous, pure white, and have an almost overpowering but delightful lily-scent. A very free bloomer from September to March. 15 feet.

*Brunfelsia* (*Francisea*)—Compact growing shrubs, with plentiful deep green leaves, and covered from September to the end of the year with multitudes of glorious purple flowers of various shades. As the flowers grow older they fade to creamy white, and the effect of new and old flowers, of all shades on the plant, is quite unique. The various species differ chiefly in shade and size of flowers. *B. americana* has large yellow flowers. The flowers of *B. magnifica* are not so freely produced as with *B. eximia*, but they are much larger sometimes measuring 3 inches across. Height, 5 to 8 feet. Fairly hardy.

\**Buddleia*—*B. veitchiana*, *B. magnifica*, and *B. variabilis* are well worth a place in all shrubberies. Foliage is grey-green, spear-shaped, and very large trusses of lilac flowers are pro-

duced on the terminals of young branches. A small young plant will grow 8 feet, and form a huge mass in a single season, making a fine show of colour. Apt to be cut down by heavy frost, the growth being succulent, but will quickly spring again from the rootstock as soon as warm weather arrives.

The variety "lindleyana," however, is hardy and will stand considerable frost. There is also a comparatively dwarf type, 4 feet, and very free, with purple racemes.

\**Buxus sempervirens* (Box)—Forms a very compact dwarf shrub of deep green colour. Leaves are small, oval, and very firm. Quite evergreen and hardy. 5 feet. Better as a specimen than a border plant.

\**Callicarpa purpurea*—A dwarf, loose-growing shrub, bearing purple-blue berries abundantly along the slender stems. 4 to 6 feet.

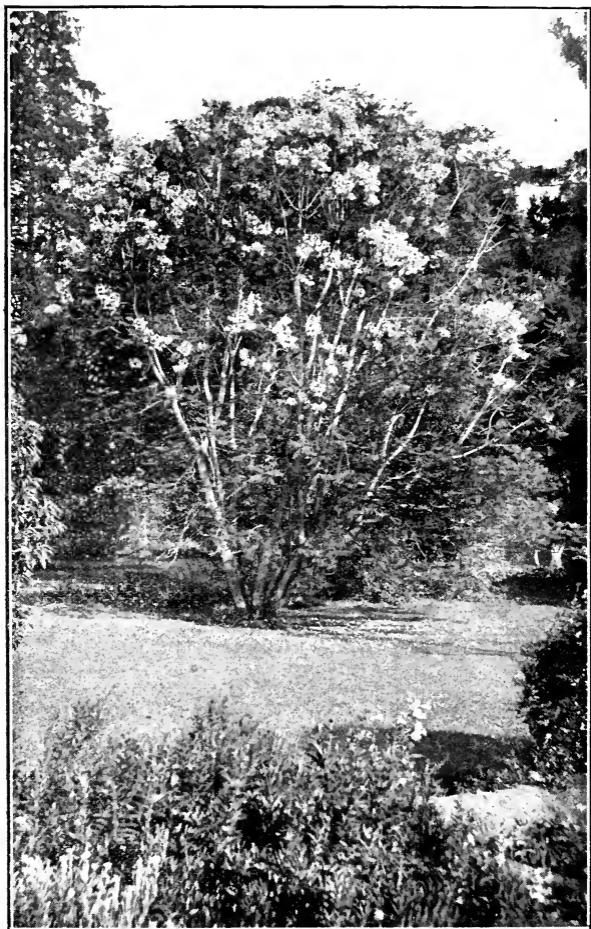
*Callitris rhomboides* (Oyster Bay Pine)—Very dark green foliage and the most compact growing of our Conifers. Of quick growth and handsome appearance. *C. quadrivalvis* is also well worth growing for ornament. 30 to 40 feet.

*Callistemon* (Bottle Brush)—The handsome scarlet, crimson, or yellow flowers of the species of *Callistemon* make it a desirable shrub, and very showy. The form of plant is somewhat rigid. 15 to 30 feet.

\**Calodendron capensis* (Cape Chestnut)—On the Coast this tree is almost evergreen, but where there is any frost it becomes deciduous. It is a large tree; sometimes 50 feet high, with spreading branches and buttressed stem. The great beauty is in the large tresses of lilac flowers, which are borne abundantly well above the foliage, during late Spring. It seldom flowers before the tenth year.

*Camellia japonica*—Where the rainfall is fairly abundant, particularly in the Natal and East Griqualand mist belt, this handsome flowering shrub (or small tree) does remarkably well, and from June to August bears an abundance of beautiful large rosettes of white, striped, red, or pink flowers, which are grand against the background of deep green foliage. But Camellias are not suitable subjects for dry districts, or dry situations. The named varieties commence to flower when very young. Of slow growth. Some of the best varieties are *Alba plena* (pure white imbricated petals), *Chandleri elegans* (large crimson, spotted white), *Princess Bacchieshi* (red and pink, spotted white), *Valtevedo* (pale pink, blotched crimson). The trees must have shelter from blazing sun and hot winds. 20 feet.

*Camellia thea* (The Tea Shrub)—A compact and very dark green-leaved shrub of 8 feet high and equal diameter when well grown as a specimen, and bearing numerous white, cup-shaped flowers. This plant also makes a good evergreen hedge.



*Jacaranda mimosaeifolia* in full bloom.

*Carissa grandiflora* (Amatungula)—The common fruit bearing shrub so plentiful on the Natal Coast. It is well worth growing for ornament as a specimen. Quite evergreen, first bearing sweet-scented, star-like flowers, almost like large Jasmine, which are followed by the scarlet fruits. Rather slow growing and only suitable for districts within a reasonable distance of Coast humidity. Hardy. 10 feet.

\**Castanea vesca* (Sweet Chestnut, Spanish Chestnut)—A highly ornamental small tree, deciduous, bearing the sweet chestnuts of commerce. So far it has not done well in South Africa, owing chiefly to the long winter drought and lack of lime in S.A. soils. 25 feet.

*Castanospermum australe* (Australian Chestnut)—An exceedingly handsome and fairly large shade and ornamental tree for warm Midlands and Coast belt. The foliage is large and bold and creates grateful shade all through the year. In October and November numerous orange-coloured large flowers are produced, followed by the large seed pods. Not to be recommended where there is 10° or more of frost. 50 feet.

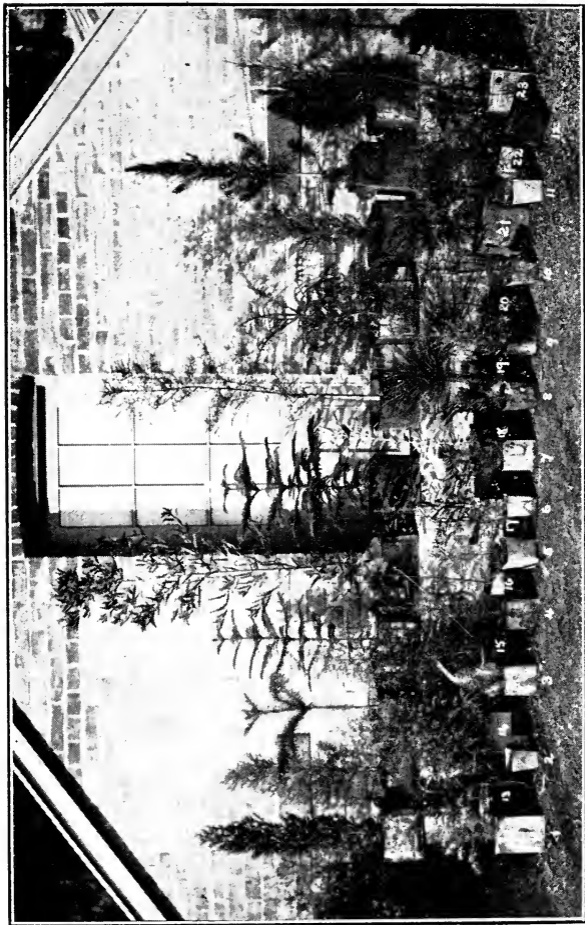
\**Casuarinas*—The foliage of the Casuarinas is needle-like, like the Pines, but generally more pendulous and equally distributed. Most species are of very quick growth and hardy all over. *C. cunninghamii* and *leptoclada* are excellent wind-break plants. The brighter green foliage of *C. glauca*, as also the purple-tinted foliage of *C. suberosa*, can be used with picturesque effect in mixed shrubbery and tree planting. 40 to 80 feet. *C. quadrivalvis* is the best for the Coast.

\**Ceanothus*—Dwarf, compact shrubs, growing about 6 feet high, and bearing spikes of numerous small flowers on the ends of the young branches. Colours from white through blue to purple. Successful varieties are *Americanus* (white), *azureus* (pale blue), *Bijou* (pink), and *Gloire de Versailles* (a clear azure blue). Evergreen.

*Cedrela toona* (Indian Mahogany)—Is a very handsome and large tree for warm districts only, and does well in Natal Midlands, although not so well on the Coast belt. Best as a single specimen, and is very handsome. Almost evergreen. 60 feet or more.

\**Cedrus atlantica* (Atlas Cedar)—Is very similar in habit to the Deodar, but darker in foliage, and not quite as graceful. 80 to 100 feet.

\**Cedrus deodora* (Indian Cedar or Deodar)—The great beauty of the Deodar competes strongly with *Araucaria excelsa* for pride of place, while the former is hardy for the coldest districts. The glaucous green foliage, the half droop of the branches, and the towering stateliness of a well-grown specimen, make this tree a favourite with all. For ornament is seen best as a single specimen on a lawn, with the lower branches sweeping the grass. Slow of growth. Height, 80 to 150 feet.



A group of young trees ready for surrubbery work.



- \**Cedrus libani* (Cedar of Lebanon)—Is scarcely attractive for other than historic reasons, and is only handsome as an old specimen. 50 feet.
- Cestrum* and *Habrothamnus* are all somewhat tender and need a warm corner on the high veld, although quite successful anywhere in the middle veld. *C. lævegatum*, the "Inkberry," is used as a hedge plant on the Natal Coast, but cannot be recommended. *C. aurantiacum* is large and vigorous, and bears yellow flowers in profusion. *C. elegans* is the best of all as a garden shrub, bearing clusters of graceful rosy crimson flowers in great profusion. 6 to 15 feet.
- Cestrum cyanea* has pendulous clusters of purple-blue flowers. 20 feet.
- \**Choisya ternata*—An excellent and hardy shrub, with most beautiful shiny dark green foliage. Flowers large, white, and sweetly scented. 8 feet.
- Clerodendron fargesii*—A strong shrub, suckering rather freely, with bold foliage, purple tinted, and clusters of pendant white flowers. 6 feet.
- Clerodendron fallax*—The *Clerodendrons* are flower border shrubs, for warm Midlands and Coast. *C. fallax* bears very handsome coral flowers. 4 feet.
- Combretum*—See Climbing Plants p. 110.
- Coprosma*—The common deep shining green garden type is *C. lucida*. There is a variety of this, *C. l. aurea*, with roundish leaves of green and gold. A third variety, *C. baucri*, is also variegated green and gold. All are dwarf, drooping shrubs, three to four feet high, of great beauty. Nice rockery plants.
- \**Cordylina* (*Dracena*)—The *Cordylines* are used for lawns, or for tropical effects as foliage plants. They are palm-like, with drooping (mostly) narrow leaves, very graceful and quite hardy. The varieties *D. australis*, *D. indivisa*, *D. draco* are the hardiest. Height from 6 to 15 feet. Of slow growth.
- \**Coronilla emerus* (*Scorpion Senna*)—A dwarf compact shrub with good foliage and very numerous yellow flowers. 4 feet.
- \**Coronilla glauca*—Similar to the above in general habit, but the handsome foliage is a glaucous green and very pretty. 4 feet.
- \**Cotoneasters*—The varieties used in shrubberies and for rockeries are all small-leaved, dark green, and bear an abundance of scarlet berries in Autumn and Winter. *C. horizontalis* is of trailing habit and suitable for rough rocks. *C. rotundifolia* is a small, compact bush, about 4 feet. *C. simmonsii* is larger and looser, but very handsome when in berry. 6 feet.
- \**Cryptomeria japonica* (*Japanese Cedar*)—An extremely handsome Conifer, of fine erect growth and graceful foliage. Some of the specimens in Natal have reached a height of 60 feet, and are fine objects. The beauty exists even in a tiny young tree, and increases up to 20 years of age if plenty of room is allowed for development. The tree stands cold well,

and is quite at home on good soil where there is a medium rainfall. The sub-variety "elegans," changes colour to a rich brown in Winter, and makes a nice variation in foliage effect.

\**Crataegus pyracantha*—Is similar to the European Hawthorn in general appearance, and eventually reaches a height of 20-25 feet. In Autumn and Winter the trees are radiant with scarlet or yellow berries, a rich effect after the leaves have gone. This would probably make an excellent hedge plant in the colder districts, say above an elevation of 3,000 feet. Better than common Hawthorn, and it is not so subject to disease. The white, pink, and red varieties of Hawthorn (*C. oxycantha*) are beautiful when in bloom, but are often covered with scale and other diseases.

*Crotons*—Many beautiful and choice varieties are grown to perfection on the Natal Coast and a few miles inland. The foliage is of many shapes, and margined, marbled, and splashed with yellow and red. Height varies from 2 to 6 feet. At Maritzburg (2,300 feet) they nearly all fail, the climate being too cold for them as outdoor plants.

\**Cunninghamia sinensis*—The habit of growth and foliage of this handsome tree are similar to *Araucaria bidwillii*, and it is one of the handsomest of Conifers for the colder districts. Of rather slow growth, but, as an ornamental tree, very beautiful from the smallest stage, 40 feet.

*Cuphea eximia*—A compact little shrub, suckering rather freely, with good foliage and tubular scarlet and yellow flowers, which are numerous and continuous. Hardy. For the front row, being only 3 or 4 feet high. *C. platycentra* is better placed in the herbaceous border than in a shrubbery. *C. jorullensis* bears numerous corymbs of intense scarlet flowers continuously.

\**Cupressus*—Practically all varieties of Cypress are highly ornamental subjects at all stages of growth, and in this group a great variety of colour is available in foliage, from the dark green of *C. sempervirens* to the grey-green of *C. arizonica*. Varieties are very numerous indeed, and cannot all be mentioned here. For dark colours, *C. funebris*, with graceful drooping foliage, *C. goveniana*, *C. McNabiana* and *C. sempervirens* should be chosen. For lighter greens, Lawson's Cypress, *C. lusitanica*, *C. torulosa* (and its fine sub-variety, *majestica*), *C. knightiana*, and *C. arizonica*. The last is particularly adaptable for dry districts. *C. sempervirens* is tall and very slender. Most of the others more or less spreading in habit. For single specimens on grass, *C. lawsoniana*, *C. lusitanica*, *C. arizonica*, *C. knightiana*, and *C. torulosa majestica* will be found the best. The lowest branches should never be removed for this purpose, and only young specimens well foliated to the base should be chosen for such positions.

*Cyphomandra betacea*, or the Tree Tomato, is sometimes used for ornamental effect, because of its fine dark yellow pendant fruits. But its life is short (5 or 6 years), and it is only available for the warm districts, on account of its delicacy. 8 feet.

\**Cydonia (Pyrus) japonica* (Japan Quince)—Handsome pink or scarlet flowers produced along the branches before the leaves appear in Spring. The general habit is somewhat loose and untidy, but may be cut into good shape with early attention. Better on the high veld than at lower elevations. 6 to 8 feet.

Good varieties are *C. umbilicata rubra*, rosy red; *C. rubra grandiflora*, pomegranate red; "Grenada," deep garnet-scarlet; "Vermillion," vermilion-red; and *C. alba*, white.

\**Cytisus*—This includes the very handsome European Laburnum, which, however, cannot be called a success in South Africa. But some of the *Cytisus*, commonly called "Broom," such as the White Portugal Broom, Canary Island Broom (*C. canariensis*) are highly ornamental and quite successful. The Portugal Broom bears numerous white flowers. Others are yellow, some of them shaded or marked brown or red. The long narrow foliage gives variety mixed with other trees. 4 to 10 feet.

*Dais cotinifolia*—A small tree, native to Natal, with innumerable umbels of pink flowers. Leaves obovate. A gem. 12 feet.

\**Daisies*—Some of the bush Daisies are useful and hardy plants for sparse use in a front shrubbery line near the house, and they are all very free bloomers. Their life is short, only two or three years. The one named "Snow Queen," double flowered, is not so hardy, and is best as an annual plant.

\**Daphne indica*—A free-flowering handsome little shrub, with sweet-scented white or pink flowers. Height, 4 to 6 feet.

*Datura knightii*, the "Moonflower"—Soft wooded and delicate shrub, growing to 12 feet, and bearing pendant, very large double, lily-like flowers, very sweetly scented. Will stand only 3 or 4 degrees of frost. There is a variety with single flowers also, white and larger still, which is very fine. Also a double yellow, *D. chlorantha*.

\**Diospyros kaki* (Persimmon)—The fruiting varieties of Persimmon are extremely handsome in foliage only, and when the large scarlet or orange fruits are ripening the effect is magnificent. The most effective one is the variety "Tananashi," which bears freely and has fine orange fruits. 12 feet. Deciduous.

*Dodonia viscosa*—A quick-growing evergreen tree, suitable for making screens where speed is an object. 15 feet. Not suitable for cold districts.

*Dracaena*—See Cordylne.



**Eucalyptus Saligna, 8 years old.**

- \**Deutzias*, or *Bridal Wreath*, are amongst the most graceful and free-flowering of small shrubs, and are quite hardy. *D. gracilis*, the true Bridal Wreath, bears a wonderful profusion of pure white flowers in Spring and early Summer, gracefully disposed along the branches. *D. crenata flore plena* is just as free flowering, the blooms being quite double, and tinted pink. *D. scabra* is a rather more vigorous bush, and bears large saucer-shaped single white flowers. 6 to 10 feet.
- Ducernnoia adhatadoides*—May either be classed as a drooping shrub or a climbing plant. A vigorous and free flowering plant with pinkish-white, tubular flowers. 10 feet.
- \**Duranta ellisii* and *Duranta plumieri*—White and blue flowers respectively. Very hardy shrubs or small trees, reaching to 15 feet. The tips of the slender branches are crowned with delightful and graceful racemes of small flowers, showing up well against the foliage. In cold districts the flowering period is from October to February, but in warm districts it extends much longer.
- \**Elaeagnus longipes* (Japanese Oleaster)—Quite a dwarf shrub, with evergreen leaves which are silvery underneath. The flowers are insignificant, but the clusters of orange-coloured fruits are very effective. 6 feet.
- E. simoni tricolor* is a dwarfer type, some 3½ feet, with pendulous branches and finely variegated leaves.
- Enccephalartos*—The commonest Natal species, *E. altensteinii*, is a handsome palm-like plant and very hardy. The growth of stem is very slow, but even when quite young, before the growth of stem, large pinnate leaves are thrown out, which are very striking and useful for foliage variation. 6 feet.
- Erythrina crista-galli* (The Coral Tree)—In the colder districts this shrub is cut down by frost each Autumn, but in Spring numerous young shoots are sent up; which are covered in November and December with tubular orange-scarlet flowers, large, and of curious shape. 10 feet. *E. humeana* has flowers of a brilliant scarlet. It is indigenous to South Africa, and is well worth a place in all gardens. 4 to 5 feet. Practically deciduous and tuberous rooted. *E. caffra*, the Kaffir Boom, is a large tree, 20 feet, and is a well-known Coast and warm Midlands type. Flowers scarlet.
- \**Escallonia montevidensis*—A fine vigorous shrub, growing to 5 ft. covered in late spring with large panicles of white flowers. *E. ingrami* is a dwarfer and more pendant form, with immense quantities of dull crimson flowers along every branch. 4 feet.
- Eucalyptus*—The two varieties used for ornamental work are *E. ficifolia*, with thick, leathery, shining leaves, and large, brilliant red or pink flowers, and *E. calophylla rosea*, with rose-coloured flowers. Both are rather small trees, and scarcely hardy enough for cold districts.\* *E. rudis* is a fine large breakwind tree, and holds its branches much lower down than most varieties. 60 feet.



8-year-old Eucalyptus plantation.

*Eugenia*s—*E. jambos*, the Rose Apple, is tender and only suitable for Coast and warm Midlands planting; but here it is large and handsome, with creamy flowers and edible fruit. *E. eucalyptoides*, commonly used as a good hedge plant where the frost does not exceed 10°, also makes a very large tree, with delightful deep green, shining foliage. *E. myrtifolia* is a small compact tree with numerous flowers, followed by multitudes of scarlet fruits, which are edible. 15 feet. All the varieties are well worth growing for ornament.

\**Euonymus*—The golden-variegated leaved, and the one with white variegation are to be recommended for the cold districts; but on the Coast and in warm valleys they often get badly infested with "red scale." They are for foliage effect only. Of rather slow growth, bushy and compact, and rarely more than 6 feet high. The type, "*E. japonicus*," is very dark green and more vigorous, reaching to 10 feet.

\**Fabricia laevigata*—A pretty grey-foliaged shrub, with drooping branches. 10 feet.

\**Fagus sylvatica* (The European Beech Tree)—Neither this type nor the purple-leaved variety seem to do well with us, and cannot be recommended as yet. There may be specially favoured small districts with high elevation, good rainfall, and good deep soil, where success may be attained, but these are very exceptional conditions. These remarks also apply to European Ash, most of the Maples, and Sycamores, and English Elm. 60 feet.

*Fatsia papyrifera*—See *Aralia*.

*Flamboyant*—See *Poinciana regia*.

\**Fraxinus* (Ash)—As above mentioned, the English Ash seldom does well in South Africa. But Algerian Ash (*F. E. kabylia*) and American Ash (*F. americana*) seem to do better. Deciduous. About 60 feet.

*Ficus elastica*—One of the largest of the Fig family, with spreading branches, deep green, large, glossy leaves, of leathery thickness. Young specimens are very shapely and beautiful; but older and larger specimens are more grand than pretty. 50 feet. There is a variegated-leaved variety, the leaves being blotched white. As this grows large the variegation vanishes.

\**Forsythea suspensa*—Drooping shrub. The yellow flowers are numerous and are borne all along the branches in early Spring.

*F. fortunei decipiens* has a more erect and vigorous growth, with solitary flowers of bright yellow, with long styles on long peduncles. Hardy. 5 feet.

*Francisca*—See *Brunfelsia*.

*Fuchsia riccartonii*—Many of the single-flowered Fuchsias make large and handsome shrubs in the warmer and moist districts. *F. riccartonii* is particularly useful for this purpose, hardier than most varieties and making larger bushes. Flowers are clear red and very numerous. 6 feet.

- Gardenias*—*Gardenia florida* is well known and popular. Its large pure white, heavily scented flowers are freely produced from September to almost Autumn, and are well set amongst the dark green foliage. 6 feet. *Gardenia thunbergii* and *G. globosa* are indigenous to South Africa and make much larger trees, in some cases 20 to 25 feet high. The former has large star-shaped flowers, while the flowers of the latter are bell-shaped. Both are sweetly scented.
- \**Galphimia nitida*—A small shrub (5 feet) bearing many yellow flowers. Suitable for warm districts only, or sheltered spots.
- \**Genista scoparia*—The common "Broom" of Europe. The flowers are very abundant and showy. 4 feet.
- Grevilleas*—*G. robusta*, the Silky Oak, is one of the most beautiful of large ornamental trees, the fern-like leaves being quite an unusual form. In September great masses of dark yellow inflorescence cover the branches. On the high veld it is only suitable for sheltered positions, but we have seen it doing well at Johannesburg. 50 feet. *G. caleyi*, the red-flowered *Grevillea*, is a dwarf tree of 10 feet, and much hardier. Flowers are somewhat similar to the "Bottle Brush" and very gorgeous.
- Greyia sutherlandii*—Native to Natal on the edges of bush. Flowers of "bottle brush" form and a brilliant crimson-scarlet. 8 feet.
- Hamelia chrysantha*—Dwarf and somewhat tender. Corymbs of bright yellow flowers, erect on the end of the branches. 3 feet.
- Harpophyllum cafrum* (The Kafir Plum)—Indigenous in East coast bush. A fairly large tree (40 feet), with handsome pinnate foliage. For warmer districts.
- Heliotropes* sometimes form good sized bushes in the front shrubbery border, but are susceptible to cold. In a warm corner under the house sides, or where sheltered by trees, they will still do well in even cold districts. 2 to 4 feet.
- Habrothamus*.—See *Cestrum*.
- Hibiscus syriacus*—See *Althea*.
- Hibiscus*—One of the most gorgeous of all flowering shrubs and in warm situations will make a small tree with a wide spread. There are several colours, ranging from pale yellow through pink to dark crimson and scarlet, all with very large and showy flowers. In the cold districts the frost will often cut back the young succulent growth, but this quickly re-grows, and every young shoot will bear a flower. The best are *H. lambertii*, double crimson; *miniatus*, double crimson scarlet; *rosa sinensis*, single pink, and *rosa sinensis fulgida*, single crimson. *H. cooperii*, a small growing form, with green and pale yellow foliage, is grown for foliage effect only. 10 feet.
- Hibiscus mutabilis*—Is deciduous, even as low down as Maritzburg. The flowers are large rosettes, opening white, and changing to a delightful rose tint. 10 feet.



*Hibiscus schizopetalus*—The growth of this type is more upright and rigid, with smaller leaves. The flowers are pendulous, and beautifully crimped and lacinated. Colour veined scarlet. 10 feet. Suitable for a warm corner, and may be trained to advantage on a pergola.

\**Holmskioldia sanguinea*—A fairly hardy shrub, bearing a profusion of brick-red flowers in large bunches, which hang a long time. 6 feet.

\**Hydrangeas*—Hydrangeas love semi-shade and water, and are the happiest on the edge of a pond or stream. But one often sees them doing very well in the ordinary garden, especially if somewhat sheltered by large trees or buildings. The huge tresses of white, pink, or blue flowers are at their best in November and December. The colour of the flowers will be affected by mineral contents of soil, and a pink which may be true in some districts may change to almost blue in others. 4 feet. The best are Thomas Hogg, white; *sinensis*, a true blue; *hortensis*, varies from blue to pink. *H. variegata* has leaves blotched white, the flowers being poor.

\**Hydrangea paniculata* is a hardier plant, more woody in growth, and loses its leaves in Winter. The pure white flower heads are very large, and last a long time. 5 feet.

\**Hypericum* (St. John's Wort)—A very dwarf shrub, with multitudes of bright yellow blooms, produced several times during a season. *H. moserianum* is the one most generally seen, but there are better types which should be imported. They would be quite successful all over South Africa. There is a variegated form of *H. moserianum*, called "tricolor." 2 to 4 feet. To the preceding may be added:

*H. henryi*, a very vigorous bush, growing to 5 feet, and full of flowers continuously. *H. sinensis*, dwarf (2½ feet); and *H. calycinum*, 2 feet, with fine foliage and very free flowering.

*Ixora coccinia*—Another very dwarf and compact shrub, of woody growth, and covered in December and January with vivid scarlet corymbs of flowers. A glow of rich colour. 4 feet. Tender.

*Jacaranda mimosaefolia*—A very handsome, fairly large tree, with finely pinnate fern-like foliage, and glorious masses of blue flowers in mid-Spring. This is a favourite street tree in Durban. In cold districts it becomes deciduous and will do well when once beyond a height of 6 feet. Shelter from frost will be necessary for the first two Winters therefore. Fine trees may be seen in Johannesburg, with partial shade from cold winds. 30 feet. There is a white flowered form of exactly the same type of growth.

\**Jasminum* (Jasmine)—Nearly all the Jasmines are semi-climbers, but most of them also form graceful drooping shrubs, even without trimming or training. The star-like flowers are very freely produced. *J. gracillimum*, *streptopus*, have



***Magnolia grandiflora.***

single white flowers. The flowers of *J. sambac* are produced in graceful clusters, and the double form is almost like a miniature rose. *J. revolutum*, *J. nudiflorum* and *J. primulinum* have many yellow stars, produced for a long period. 4 to 10 feet.

*Jatropha multifida*—A small shrub with very vivid scarlet flowers on the ends of the branches. Only half hardy. 6 feet.

*Justicia carnea*—A small shrub, sending up many erect stems, on the ends of which are clusters of long tubular, erect pink flowers. A long bloomer, suitable for partial shade. 4 feet.

\**Junipers*—These make very handsome specimen trees for lawns, particularly *J. virginiana*, *J. bermudiana*, and *J. thurifera*. Also excellent compact subjects for the back row of a shrubbery. *J. virginiana* is the quickest in growth and the most suitable for inland districts. 40 to 60 feet.

\**Kerria japonica*—Quite evergreen, with small imbricated leaves and numerous double yellow flowers, borne along the slender stems. The plants sucker freely and make handsome groups. One form has leaves variegated with white or cream. 4 to 6 feet.

\**Lagerstroemia indica* (Pride of India)—Handsome and hardy everywhere in South Africa. Leafless in Winter. The large spikes of lilac, red, or white flowers are at their best in December and early January, and are produced on young growth. 20 feet.

*Lagerstroemia regina*—Is more delicate and perhaps only suitable for Coast and warm Midlands. The flowers are red and very gorgeous. 15 feet.

\**Lagunaria pattersonii*—A beautiful and very hardy small tree, 20 to 30 feet, with greyish-green foliage, and numerous purplish-pink flowers. Showy.

*Lasiandra macrantha grandiflora*—Unfortunately only half-hardy and sometimes badly punished by frost and wind at Maritzburg. The foliage is a hairy purple-green and handsome. Flowers deep rich blue-purple cups, about 2½ inches across. 8 feet.

\**Laurels*—Good evergreens, with rich green foliage. Compact growth, subject, however, to attacks of red scale. 10 to 15 feet.

*Laurestinus*—See *Viburnum tinus*.

\**Laurus camphora* (Camphor Tree)—A very large evergreen tree, with heavy shade. Almost hardy. Suitable for a single specimen on grass. 50 feet.

*Leucadendron argenteum* (Cape Silver Tree)—Grown for the sake of its silvery foliage. 20 feet. Slow growing and not satisfactory for many years in inland districts.

\**Leycesteria formosa*—A very handsome, deciduous shrub, with numerous flowers, white, tinged purple. Quite hardy. 6 feet.



Oleanders, with hedge of *Spiraea Reevesii* (*S. prunifolia*).

- \**Ligustrum* (Privet, various)—The Privets are much more valuable grown as specimen trees than as hedge plants. Grown with plenty of room for full development, they are less subject to attacks from scale insects. Perhaps the best of them for this purpose is the large *L. lucidum*, which has large leaves. 25 feet. The smaller types, such as *L. sinensis nana*, make nice specimens for the second line of shrubberies. Foliage rich dark green. Flower panicles white. 10 feet.
- \**Lilac*, English—See *Syringa*.
- \**Liriodendron tulipifera* (Tulip Tree)—A large and very handsome deciduous tree, making a magnificent specimen on good deep soil. Foliage pale green and large, rather late in appearing (November). Flowers, purple-mauve and large. The Tulip Tree is a valuable timber tree, but is generally more prized for its beauty than for its economic value. A grand specimen tree for lawn or field. 60 feet.
- \**Linum* (*Reinwardtia*) *trigynum*—A small shrub of suckering habit, which soon forms strong clumps. The fine yellow flowers are very freely produced in Winter, and this makes it one of the most valuable of our yellow-flowered shrubs. 4 feet.
- \**Lonicera gigantea superba*—Is a truly superb bush honeysuckle, with glorious trusses of flowers in late spring. 4 feet.
- \**Lonicera* (or *Chamaecerasus*) *nitida*—A small, compact shrub, well branched. Small roundish leaves of clear green. A nice addition to the hardy shrubs. 3 feet. Of this class of honeysuckle we may mention also as very good *L. tartarica*, with rosy white flowers turning to yellow, and *L. t. rosea*, flowers bright pink, bordered white. Hardy. 5 feet.
- \**Loquat*—A fruit-bearing tree in warm districts only, as the frost destroys the blooms where it is severe. But a handsome foliage and shade tree all over. Sometimes used to advantage for small avenues. 15 to 20 feet. Evergreen.
- Mahonia*—See *Berberis*.
- \**Mackaya bella*—A nice indigenous shrub, bearing lilac flowers, veined purple. 4 feet.
- \**Magnolias*—The best known variety is *Magnolia grandiflora*, a large and stately tree, with firm leathery leaves and very large creamy white, 6 to 8 inch, saucer-shaped flowers. A magnificent specimen tree. *M. fuscata* is a middle-sized shrub, 10 feet or so, with insignificant dull purple flowers. But these numerous small flowers give off a delicious perfume. *M. obovata discolor* (*purpurea*) is a rather larger shrub, sometimes sending up many sucker shoots, and bears large rosy-purple tulip-shaped flowers of great beauty. Deciduous. 12 feet.
- \**Malus* (Flowering Apples and Crabs)—These are most happy in the cooler districts, but flower well down to 2,000 feet or so. The best kinds are "Excellenz Thiel," a weeping type, with

numerous flowers of delicate rose, red buds, 5 feet; "Arnoldiana," 6 feet, pale pink single flowers, very large. Buds carmine red; *Floribunda purpurea*, a very dark red flower, with blood red bud. Foliage bronzy purple when young. Fruits of all kinds are very decorative.

- \**Melaleuca styphelioides*—A very handsome shrub, with minute leaves, almost Myrtle-like. Spikes of minute white flowers are borne near the ends of the branches. Flowering branches pendulous. 15 feet.
- \**Melaleuca leucadendron* (White Tree, or Paper Bark)—The common name comes from the colour and nature of the bark, which is light coloured, and constantly peels off in thin flakes. Larger leaves than *M. styphelioides*. Flowers white. An interesting shrub. 20 feet.
- Mitchellia champaca*—A very handsome tree, about 25 feet, with large pale green undulated leaves, and highly scented yellow flowers. Will stand Midlands conditions.
- \**Morus alba*—The common black-fruited kind is useful as a quick Summer screen, being of quick growth. *M. pendula* is a drooping form, generally grafted on a strong standard and used for lawns or shrubby border.
- \**Murraya exotica*—A good evergreen shrub, with box-like leaves, and very numerous white flowers, strongly and sweetly scented. 10 feet.
- Musaenda frondosa*—8 feet. A proportion of the leaves, or bracts, are white, creating a curious and interesting effect. Flowers yellow.
- \**Myrtus communis* (Common Myrtle)—The Common Myrtle has scented foliage, often used for bouquets. 4 feet. The sub-variety, *microphylla*, has very numerous and small leaves, also scented. Handsome. 4 feet.
- \**Meyenia crecta*—Small and very useful flowering shrub, with pale blue flowers, 1½ inches across. Showy. 4 feet.
- \**Nandina domestica*—A very pretty Japanese shrub, suckering freely and sending up sturdy shoots to a height of 5 feet. The foliage is fern-like, useful for bouquets. Flowers white, in terminal spikes, followed by scarlet berries.
- \**Nerium oleander* (Oleander)—The Oleanders are great favourites, nearly always in bloom, and of graceful growth. The large terminal flowers are white, pink or deep crimson. There is a variety with variegated leaves. 15 feet. The sap of the foliage is very poisonous, and for this reason the plants should never be placed where cattle can browse on them.
- Ochna atropurpurea*—A small native shrub, 3 feet. The beauty is in the rich red calyx on which lie several jet black seeds. Interesting.
- Pandanus utilis* (Screw Pine)—A tropical and sub-tropical plant, more palm-like than tree-like, and perhaps more curious than beautiful. For tropical foliage effects. 15 feet. Very handsome when young.

*P. veitchii* is a form with leaves striped green and cream. This makes a handsome veranda plant for large pots. 4 feet.

*Paulownia imperialis*—A very beautiful small tree (20 feet), with pendant blue flowers, in large clusters. Hardy.

*Pavetta natalensis* (*P. caffra*)—A good compact native shrub, bearing an abundance of small flowers, in corymbs, about Christmas. Very attractive when in bloom. 12 feet.

\**Peach, Double-Flowering* (*Amygdalus persica*)—Most brilliant when in full bloom in September and October. The flowers, white, pink, or deep rose, precede the leaves, and cover the tree with a magnificent blaze of colour. Easily grown and hardy. 15 feet.

\**Petraea volubilis*—This may be grown as a drooping or weeping shrub as well as a climber, or may be supported in the shrubbery, or on the lawn by a triangle of posts-only. A magnificent object when covered with the long bunches of violet flowers, and standing in bloom for a long period. 10 feet.

\**Philadelphus coronarius*—Very hardy and free flowering. The flowers numerous. One of our best shrubs. 10 feet.

Many others are well worth growing, and show much variety in form and size of leaves and flowers, although all are white flowering. The popular ones are Falconeri, Gordonianus, Magdalena, Satsuma, Nepalensis, and Lutzmannii.

\**Photinia glabra* (Chinese Hawthorn)—Allied to the common Loquat. Flowers white, numerous, small, in flat terminal corymbs. A handsome shrub, with laurel-like leaves. 15 feet.

*Phyllanthus nivosus*—A tiny variegated shrub of great beauty, for warm districts only. The young foliage opens pink and red and gives the appearance of a mass of flowers. 2½ feet.

\**Pines, various*—The variety in the foliage tints of the pines, and the handsome shape of the trees is sufficient reason for their inclusion in large shrubberies, and in all large ornamental planting schemes. Perhaps the varieties which are most useful for ornamental work in South Africa are *P. canariensis*, *P. excelsa*, and *P. insignis*, but there are many others really good for the purpose. They require plenty of room for specimen development, for if planted too closely they soon drop the lower branches and become unsightly. 60 to 100 feet.

*Pittosporum, various species*, the best of which are *P. tobira*, with handsome, dark, glossy foliage, and white, sweetly-scented flowers. *P. undulatum*, the leaves of which are wavy in outline. Both are good hardy shrubs. 10-15 feet.

There is a dainty little species called *P. eugenoides* which makes a very handsome dwarf shrub. The foliage is small, of a pale metallic green, and the form is very compact. 5 feet.



**Pinus excelsa.**



*Platanus occidentalis* (Plane Tree)—A very handsome and fine shade tree where it succeeds, but perhaps best confined to the Natal Midlands and mist belt, with a Southern slope or good deep alluvial soil. Of good symmetrical shape when well grown. The foliage is bright green and very ornamental. 50 feet. *P. orientalis* is suitable for like situations. Good avenue trees.

\**Plumbago capensis*—A useful, rough, drooping shrub, bearing numerous spikes of pale blue flowers continuously. There is a white form, just as free-flowering and useful. Indigenous to South Africa. 4 feet.

*Plumeria* (The Indian "Frangipanni")—A grand plant, but delicate and only suitable for the Coast and very warm Midlands. Although there are numerous varieties, only two have been introduced to South Africa. The leaves are large, richly veined and handsome. The flowers are terminal cymes, or corymbs, firm and waxy, and useful in floral work. Very sweetly scented. *P. oculata* (*P. bicolor*) is white, with a yellow throat or eye. *P. violacea* is a rich apricot-rose—scarcely a violet. 6 feet.

*Poinciana*—The best known of the Poincianas is the Flamboyant (*P. regia*), a brilliant sight in the Eastern Coast towns when in bloom. The flowers are rich scarlet, in large panicles well above the fern-like foliage. A good shade tree. 20 feet. *P. aurea* is a much smaller tree, also with fern-like foliage, and rich yellow flower panicles. *P. pulcherima* (*P. gillesii*) is similar to the last, but the flowers are a gorgeous scarlet and gold. 10 feet. All are delicate and very sensitive to frost.

*Poinsettia pulcherima*—This is grown on the Coast belt and in the warmer Midlands and low veld for the sake of its scarlet bracts, which have a most brilliant effect in Autumn and early Winter. Tender. 8 feet. There is a form with a double "flower," perhaps better than the type. A yellow form sometimes seen is scarcely worth garden room.

\**Pomegranate* (*Punica granatum*)—The double-flowered scarlet type is the best of the Pomegranates, the flowers being more brilliant than the type, and larger. One should not forget, however, the striking effect of the highly-coloured pendulous ripe fruits of the type. 15 feet. Hardy. There is a variety with double yellow flowers.

\**Poplars*—Both the tall and stately Lombardy Poplar and the Black Italian are sometimes grown in groups, with good effect, to break up the sometimes monotonous level of other plantings. They are quite adaptable to many conditions, but are most at home near water. The Black poplar (*P. nigra*) is of very quick growth, but does not live long. 50-60 feet.

*P. macrophylla* is a very handsome and more spreading tree, with exceptionally large leaves. *P. monilifera*, already recommended for utility, is also handsome. All Poplars much prefer proximity to water.



*Platanus occidentalis*, 7 years old.

\**Prunus pissardii* (Purple-leaved Plum)—For foliage effect in a mixed shrubbery this is most useful and is very hardy in all districts. 15 to 20 feet.

*P.* "vesuvius" has a still deeper and more metallic colour. Of the flowering plums "moseri" flore pleno has bronze foliage and beautiful double pink flowers; "blireana fl. pl." has green foliage and very large double pink flowers; "triloba," semi-double pink flowers; and "sinensis fl. pl." a rich display of pure white flowers.

\**Quercus* (Oaks)—Just in a few well-favoured spots, with good rainfall and depth of soil, one sees occasionally fair specimens of the Oak. But they are really not at home in South Africa, and are perhaps grown more for sentimental reasons than for utility or beauty. Where the conditions are favourable some types may make fair and handsome specimens, however. *Q. suber*, the Cork Oak, has grown to a fine specimen near Maritzburg. The common Oak has grown into good avenues in a few well-favoured places. As an ornamental tree it is almost a failure—as a shade tree only a partial success. The same remarks apply to the ornamental scarlet and red-leaved types, *Q. coccinia* and *Q. rubra*.

\**Raphiolepis ovatus* (Indian Hawthorn)—A nice compact bush, with firm, almost round leaves and very numerous white flowers. 6 feet. *R. indica* has lanceolate leaves and more erect growth.

*Rhododendrons*—These are only successful, unfortunately, in a very few situations. One might say that success is only possible within the *mist belt* of the Eastern Coast, and even there only where a Southern aspect, good shelter, and plenty of moisture are available. Given these conditions they bloom profusely. Outside these conditions they fail utterly; and it is best to fall back on the next best thing, the allied Azaleas. 10 feet.

\**Rhus glabra*—A very handsome foliage tree throughout the Summer, and magnificent in rich brown and red effects when the Autumn comes. *Rhus vernicifera* is just as good in all ways. Both are good-sized trees, reaching 20 to 25 feet. *Rhus lanceolata* has very handsome, divided leaves, is of more succulent growth and apt to be killed down by frost in cold districts. However, it suckers well from the rootstock, and is of such quick growth that it is well worth growing even where it is cut in Winter. 10 feet.

*Russelia juncea*, and *R. floribunda* (*rotundifolia*) belong to the front line of the shrubbery. Both are only half hardy, but even in the colder districts they will spring up from the root each season and bloom well. They should, however, have a covering of rough litter to protect the rootstock from the frost. The flowers are tubular, deep scarlet, and very numerous. 3 feet.

\**Salisburia adiantifolia* (Maidenhair Tree, Ginkgo biloba)—The common name indicates the shape of the leaves, the form being much like the Pinnæ of a Maidenhair Fern. A handsome and large tree in China and Japan, but so far not very successful here.

\**Salix* (Willows, various)—Generally planted on the banks of streams, and nearly all the varieties are extremely graceful in this situation. They succeed also in any fairly moist soil and situation. The best varieties for scenic effect are *S. babylonica* (Weeping Willow), *S. caprea* (Common Willow), *S. caprea pendula* (Kilmarnock Weeping Willow), *S. purpurea*, the bark of which is purple or red, and *Vitelina aurea* with golden bark. The Osier Willows—*S. amygdalena*, *S. viminalis*, &c.—are often found useful about a homestead for various purposes, basket making, &c. 20 to 50 feet.

\**Salvias*—The shrubby varieties, especially *S. van Houtii* (crimson), are useful for shrubbery borders, but need warm positions in the colder districts. They may be preserved throughout a frost spell by being cut down and the crowns covered with loose litter.

\**Sambucus* (Elder)—The Common Elder, from which the berries which make "Elderberry Wine" are obtained, are seldom met with in South Africa, but the varieties with variegated foliage, gold and green or silver and green, are very ornamental in Summer. Deciduous. 15 feet.

The variety "laciniata" has very finely divided leaves. A very handsome shrubbery plant. 10 feet.

\**Schinus molle* (Pepper Tree)—The finely pinnate foliage of the Pepper, and the multitudes of red berries formed at various seasons, make this a favourite tree where it succeeds. It is essentially a tree for *dry* districts and thorn country, and indeed it will not succeed in the mist belt of the Eastern districts. The limbs are gnarled and twisted in all shapes, and the stem is very seldom straight. Yet it is quite a handsome foliage tree, and will succeed in very dry parts where most trees fail. 20 to 30 feet.

For the humid coast districts and some parts of the mist belt, where *S. molle* will not succeed, we prefer *S. terebinthi folius*. This grows to about 15 feet, is somewhat drooping in habit, and the numerous masses of crimson-scarlet berries are borne erect. A very showy plant in Winter.

\**Sophora japonica* (Japanese Pagoda Tree)—The leaves are graceful, deep bluish-green and pinnate. A very hardy, handsome deciduous tree inclined to sucker in the warmer districts. 30 to 50 feet.

\**Spartium junceum* (Spanish Broom)—A very hardy deciduous shrub, with rush-like branches, almost leafless. An ornamental shrubbery plant, especially when in full bloom. Flowers yellow, very numerous and prolonged. Of quick growth. 8 feet.

*Spathodea speciosa* (African Flame Tree)—Grows up to 50-60 feet. It is tropical or sub-tropical, and not suitable for Midlands and high veld. Bell-shaped, orange flowers.

*Spiraeas*—Many varieties of shrubby Spiraeas are well worth extensive adoption as garden shrubs. The most commonly grown are *S. reevesii* (Cape May), with single or double white flowers. 6 feet. *S. salicifolia*, with drooping, extremely fine and small foliage, and numerous white flowers. 4 feet. *S. douglasii*, with red flower spikes in Summer. 4 feet. There are also a few very dwarf types, cushion-like almost, and very free flowering, such as *S. callosa*, white tinted flesh; *S. callosa rubra*, bright red; *S. fræbellii*, violaceous pink. All are quite hardy in all districts, and very useful.

*Sterculias*—The best known of the Sterculias is the Flame Tree, *S. acerifolium* (or *Brachychiton acerifolia*), which, when in bloom, is a blaze of bright red. Suitable for Coast and warmer middle veld. 60 feet. A very handsome species is *S. diversifolia*, with good, shapely stem and foliage. An excellent street or shade tree. The leaves of this species are very variable in shape, being heart-shaped, entire, or three-lobed. 40 to 60 feet. *S. platanifolia*, or Chinese Parasol Tree, has plane-like leaves, and is a large and handsome species. 60 feet.

*Streptosolen jamesonii*—A small shrub (6 feet), with good pale green foliage and rich masses of orange flowers in Winter and very early Spring. It is delicate and only suitable for outdoor planting on the Coast and in frostless regions inland. Good for cutting.

\**Symphoricarpus*—A good many varieties are in cultivation, but the nicest is *S. aurea variegata*. This grows to 4 feet. Foliage beautifully variegated green and gold. Fern-like. Deciduous.

*Syncarpia laurifolia* (Turpentine Tree)—A massive evergreen tree, attaining to 200 feet. Of quick growth, and very handsome. The timber is also valuable.

\**Syringa vulgaris* (Common Lilac)—The European Lilac requires both a cool and moist situation, and is very seldom seen in bloom in South Africa because such situations are very rare. It may be successful on the Eastern slopes of the Drakensberg, but cannot be recommended for general culture. Flowers white, pink, purple, &c. 15 feet.

*Tabernaemontana coronaria* (East Indian Rose Bay)—The double-flowered form is remarkably like a Gardenia, both in foliage and leaf, but is much more tender, and only succeeds outside in practically frostless districts. The waxy white flowers are heavily scented at night. Where the plant is cut down by an unexpected frost it will soon shoot again from the base, and grow rapidly to its original size. Well worth growing. 4 feet.

- Tamarindus indicus* (Tamarind)—A fine specimen tree, but only suitable for warm districts. Flowers yellow, striped red. Foliage pinnate. Evergreen. "The acid pulp of the pods forms the medicinal tamarind" (v. Muller). A grand shade tree.
- \**Tamarix gallica* (Tamarisk)—A very hardy shrub, or small tree, with slender and feathery branches. The pink flowered form does well in Natal at an elevation of 3,000 feet and above, but the warmer Coastal district is not favourable. It is quite hardy. Admirably suited for shrubberies. 10 feet.  
*T. hispida* has rather paler foliage and better flower heads.  
*T. tetandra purpurea* has red flowers. This genus will stand very harsh and dry conditions, and will also do well in brak soil and on the sea coast.
- \**Taxodium distichum* (Swamp Cypress)—A very handsome and tall deciduous Cypress-like tree, suited for low-lying and moist situations, or stream banks. The young leaves as they appear in the Spring, remind one of the Spring appearance of the European Larch, the colour effects being very beautiful. A good timber. Quite hardy. 80 feet.
- Tecoma stans* (Yellow Elder)—A very handsome bush *Tecoma* with numerous large panicles of yellow flowers, large and showy. Stem strong and upright. A good shrubbery plant. Summer and Autumn flowering. Very free. 20 feet.
- Tecoma smithii*—Is a small, slender shrub, with yellow panicles of flowers very freely produced on the tips of the branches. Hardy. 10 feet.
- Tecoma capensis*—Splendid orange-scarlet flowers, 2 inches long, in racemes. One of the best of our indigenous shrubs. Branches slender and drooping to the ground. This will make either a drooping shrub or a climber.
- \**Thevetia nereifolia*—A large Oleander-leaved plant, with numerous yellow bell-like flowers. Hardy. 12 feet.
- \**Thuyas*—The *Thuyas* or *Arbor Vitæ*s are evergreen Coniferæ, with flat, fern-like foliage, not unlike *Cupressus lawsoniana*. Most of the varieties so far tried have done well, and although they are rather slow in growth, they are well worth growing. *Thuja orientalis* and its sub-variety "compacta," are often used as hedge plants, but this makes a neat, small tree alone. *Thuja occidentalis*, the North American type, is rather larger, but still only a small tree. *T. gigantea* (*T. lobbii*) makes a gigantic specimen in its native land, but we only know it in South Africa as a young and immature tree. It is intensely beautiful, far surpassing any of the *Cypresses*, particularly when the fresh young, bright-green tips are set off against the very dark-green of the older foliage. Growth of this variety is fairly quick. 60 feet.
- Trichillia cmetica* (Umkuhla)—For the Coast and warm Midlands we consider this by far the finest of our shade trees, the foliage being very dense. Height eventually 60 to 70

feet. Growth is rather slow. A fine avenue tree and quite evergreen.

*Tristania conferta*—A very fine tree with grey-green foliage, attaining a height of 150 feet under favourable conditions. Evergreen. The growth, however, is slow, as is the case with nearly all the first-class trees. A good shade tree.

*Tulip Tree*—See *Liriodendron*.

\**Turraea obtusifolia*—A small shrub, 4 feet, with particularly glossy dark green leaves. The flowers remind one of a large star Jasmine, and are produced singly in great numbers. In bloom nearly all the season. The plant is of slow growth, but flowers when very small. A beautiful shrub, and hardy.

\**Ulex europaeus* (Gorse, Whin)—Requires a cool district, and seldom succeeds below 3,000 feet elevation. Above this it grows well, flowers profusely, and is quite ornamental. 4 feet.

\**Ulmus campestris* ("English Elm")—A fairly successful deciduous tree in the Natal Midlands and higher, adapting itself to considerable differences in climate and soil. The Wych Elm (*U. glabra*) does well also, but suckers in an objectionable manner. 50 feet.

\**Veronica* (Shrubby kinds)—Small front row shrubs, about 3 feet high, and the different coloured flower spikes are very freely produced. Quite hardy in all districts. The colours range from pale blue (*V. andersoni*) to rich pink and violet. A favourite and commonly grown small shrub.

\**Viburnum tinus*—A very hardy *Viburnum*, suitable for cold and exposed situations. Numerous white flowers.

The sub-variety "lucidum" has glistening green leaves, of comparatively large size, and the flowers are much larger than those of the type. *Viburnum plicatum* is the Japanese Guelder Rose. A nice dwarf shrub, with creamy white flowers.

\**Viburnum opulus* (Guelder Rose, Snowball Tree)—Well known and most successful. The flowers are produced in pure white large balls, pendulous from the slender branches. 4-5 feet. *V. macrocephalum* and *V. odoratissima* should be tried in South Africa.

\**Weigela* (*Diervilla*)—The introduced varieties are so easily grown, so very free flowering and hardy, that they have become very popular indeed. The flowers are produced both as terminal clusters and in the leaf axils right down to the branches. The whole plant is extremely graceful and well adapted for all shrubberies. *W. rosea* bears rose-coloured flowers, and there is a sub-variety of this with a variegated foliage. The variety, "Eva Rathke," has dark red flowers.

"Coquette" is by far the largest flowered variety, having deep rose flowers fully 1½ inches across. *W. styriaca* is very hardy and vigorous, with flowers of a clear red. Abel Carriere has light red flowers.

\**Yellow Wood* (Podocarpus)—*P. thunbergii*, var. *falcata*, makes a most stately and beautiful specimen tree, and although of rather slow growth, should find a place in all ornamental grounds. It is best grown on grass or gravel, for overcrowding will destroy the lower branches, which should sweep the ground if the best effect is desired. 80 feet.

*Yuccas*—These are for tropical effect. Fine spikes of milk white flowers in early Autumn. 10 feet.

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## Section IV.

## CHAPTER XIV.

## PLANTS FOR SPECIAL EFFECT.

TROPICAL effects are sometimes desired in warm districts, or in warm positions in the colder districts. Such effects are possible in the high veld by a judicious use of Bamboos, Cordylines (Dracenas), Agaves, Yuccas, Strelitzia augusta, S. regina, Encephalartos, and one or two of the hardy Palms, such as Livistona or Phoenix. For the warm Midlands and high Coast lands one might add Plantain, Pawpaws, Cocos plumosa, Ficus elastica, Seaforthia elegans, and Chamærops excelsa.

Here must be no lines or formality, but rather a judiciously wild tangle, such as one finds in a natural East Coast semi-jungle. There should be tall and thick shelter trees to shelter this nook, keeping away possible cold winds and increasing the humidity of the surroundings.

## Roses.

In a sense Roses have no business in this book. But there are just a few which never seem to belong to the rosary, but rather to the tangle and roughness outside. To cover a high bank, a mass of rocks, old walls, or even an old tree stump, we know of nothing better than a wild growing, vigorous Rose, never pruned, but with huge masses of glorious flowers in the right season.

For this purpose the best varieties are the Noisettes, "Lamarque," Rêve D'Or, Bouquet D'Or, and Buff Maréchal Niel; Climbing Polyanthas Aglaia, Crimson Rambler, Tausendschön; and the Wichurianas Dorothy Perkins, White Dorothy, Evangeline, and Debutante. And, of course, all the Banksia Roses.

GRASSES AND VERY HARDY HERBACEOUS PLANTS also find their places in scenic gardening. There will be nooks and corners here and there, on the shrubbery border or among the rocks, where Pampas grass, Arundo donax, Bocconia, Colocasias, Dahlia imperialis, Echinacea, Gaura, Cannas, Helonium, Hollyhocks, Papyrus, &c., will create variety and add greatly to the effects in foliage variation. For some of these special pockets of good soil will be necessary.



The place for palms.—The tall one is *Scaevola elegans*, others *Washingtonia filifera* and *W. robusta*.

## LIST OF PLANTS FOR SPECIAL EFFECTS— PALMS, GRASSES, TROPICAL PLANTS, &c.

*Cordylines and Dracaenas*—These are palm-like plants reaching to a height of about 8 to 10 feet, of slow growth. They may be recommended especially for the colder districts, where Palms do not succeed, for lawns or shrubbery borders. The long leaves form a drooping crown on an erect stem. *D. australis* and *D. indivisa* differ only in the width of the leaves, the latter being much narrower, and perhaps, therefore, more graceful in form. In *D. I. lineata* there is a white or cream line running up the centre of each leaf. *D. I. veitchii* is similar to the type, but the base of the leaf sheath and the back of the mid-rib are deep red. *C. cannæfolia* has Canna-like leaves, and often has branches thrown out from a height of one or two feet from the ground. *D. draco* (Dragon Tree) is more tree-like than other types, and loses its symmetry and grace as it ages. But as a young specimen it is extremely beautiful and effective. The family is a large one and many other varieties will eventually be found useful in South Africa.

*Agaves*—Are often very effective in planting rough ground or rocks in South Africa. *A. americana variegata*, with yellow and green stripes, is particularly good. *A. sisalana*, the Sisel hemp, has very long leaves, gracefully curving and drooping outwards. These do well on any soil.

*Aloes*—A good many of the indigenous species are well worth a place in rock gardens, but seem quite misplaced in shrubbery or borders. (See Rock Plants.) The same remarks apply to varieties of Cactus.

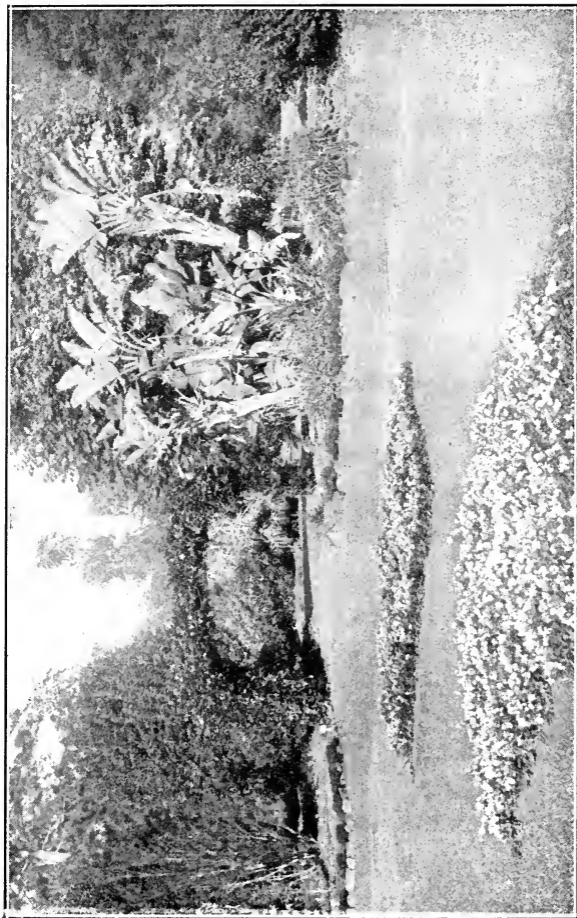
*Colocasia* (The Common Elephant's Ear)—Is suitable for groups in shady and moist corners.

*Cyathea dregii* (The Common Natal Tree Fern)—Most handsome for outdoor planting, and very hardy.

*Cycas revoluta* and *C. circinalis* make beautiful specimen plants for low borders and lawns in the warm or Coast districts. They are slow in growth, but very attractive even when quite small.

*Encephalartos* (a native Cycad), is more hardy and will stand an elevation of 3,000 feet or even more. As it ages a sturdy stem is formed, and the "fronds" droop gracefully outwards from the crown. Of slow growth.

*Strelitzia augusta* will take the place of Bananas and other Musas in the colder districts, where the latter are frost killed in Winter. 15 feet. *S. degina* is too small as specimen for much foliage effect, and is generally grown for its curious crimson flower spathe. 3 feet.



The large leaved plant is *Streitzia augusta*, backed by *Magnolia grandiflora*. Large tree on left, *Grevillea robusta*.

*Bananas*, to which family *Musa religiosa* and *Musa ensete* belong, are always effective, but even for foliage they are limited to the Coast and warm Midlands.

GRASSES, &c.—Those most suitable for foliage relief in shrubberies, mixed borders, &c., are the following:

*Pampas Grass* (*Gynerium argenteum*)—With tall, gracefully drooping leaves, growing to height of 4 feet or more. The flower plumes rise above this, often to 8 or 9 feet. There are two distinct colours in the plumes, one a silvery grey and the other might be called a rosy-silver.

*Eulalias*—A very ornamental grass, growing 3 feet high. There are three distinct types, all garden varieties of *E. japonica*. *Zebrina* has leaves with numerous crossbars of cream or yellow. In "striata" the leaves are lined with white. "gracillima" is all green, but the leaves are very narrow and droop most gracefully. The root-stock is hardy, and, although the top growth may be frosted down in Winter, it readily springs again in early Spring. Most beautiful when the plants are in full flower.

*Arundo donax* (Danubian Reed)—Is most at home in moist ground, but not necessarily confined to this position, as it is often found in perfect health in ordinary garden soil. The most ornamental types are *A. donax variegata*, the leaves of which are striped cream and green, and *A. donax conspicua*, also variegated, but bearing a beautiful flower panicle, almost as nice as Pampas Grass. All *Arundos* should be cut down as soon as they become unsightly in the Autumn. 10 feet.

*Cyperus alternifolius* (Umbrella Grass)—Makes splendid clumps.

*Alpinia nutens*—Has Canna-like foliage, and most delightful large crimson and pink flower panicles, rising well above the foliage. The individual flowers are almost like some of the ground orchids in shape. 8 feet. The smaller grasses are more suited to the dwarf mixed borders than for shrubbery work.

*Bocconia*—Is rather weedy, suckering freely, but the foliage is very large and good, and the whole plant stately. There are three or four types, the best known being *B. cordata*, *B. macrocarpa*, and *B. sanguinea*. They only differ in the size and colour of the flower plumes and seed vessels. 8 feet.

*Hedychium*—Some of the large varieties, such as *H. coronarium*, *H. gardnerianum*, and *H. flavum* are useful in moist and shady corners, and on the borders of ponds or streams. Foliage is Canna-like. Flowers are white, cream and yellow respectively, and scented. 6 feet.

*Papyrus antiquorum*—The ancient Egyptian paper plant is best in shallow water, or in swampy ground. It grows to a height of 8 feet and the globular seed heads are quite ornamental.

**PALMS.**—A very large variety of Palms are quite at home on the Natal Coast and for some miles inland, and may there be used with magnificent effect in landscape gardening. At higher elevations, where frost has to be reckoned with, the number which succeed is very limited, and the safest selection would be:

*Cocos plumosa*—20 feet, very graceful.

*Livistona australis* (Corypha)—A fine fan Palm. 40 feet and over.

*Phoenix dactylifera*, *P. tennuis*, *P. reclinata*, *P. rupicola*, all succeed well outside, except in the extreme high veld. These are commonly called date palms. 10 to 50 feet.

*Seaforthia elegans*—Is safe up to an elevation of 3,000 feet, except on cold flat land. 30 feet.

*Latania bourbonica*—A very fine fan palm, is good on verandahs and in warm Midlands situations. 8 feet.

*Chamerops excelsa* and *C. utilis* are fairly hardy for the middle veld, but should be given high ground and good wind break shelter. 12 to 15 feet.

**Bamboos** of any variety are extremely useful for tropical effect and adapt themselves fairly well to a variety of situations. Varieties may be chosen to grow almost any height, from 5 feet up to 60 and 100 feet. These are generally obtained from Nurserymen as root divisions, and in the case of the larger types, it is a good plan to plant fairly deeply, and then keep the remnant of the cut stem filled with water until rooting has safely taken place.

Naturally the larger types are most at home on the Coast, but these will stand 8 or 10 degrees of frost. For the colder districts the Solid Bamboo (*Dendrocalamus strictus*) should be planted. All Bamboos like moist situations—edges of streams are ideal situations. They should be planted wherever possible, both for ornamental effect and their extreme usefulness in garden and other work. *B. fortunei* and also the variegated sub-variety make excellent hedge plants as well as specimens. Of intermediate size there are *B. arundinacea*, freely increased from suckers (20 feet); *arundinacea falcata* (10 feet); and *Bambusa nigra* (20 feet); of the larger ones the so-called Giant Bamboos and the tall one with green and gold stems. The botanic names of these are doubtful.

## Section V.

## CHAPTER XV.

CLIMBING PLANTS, TRAILING PLANTS,  
TWINING PLANTS.

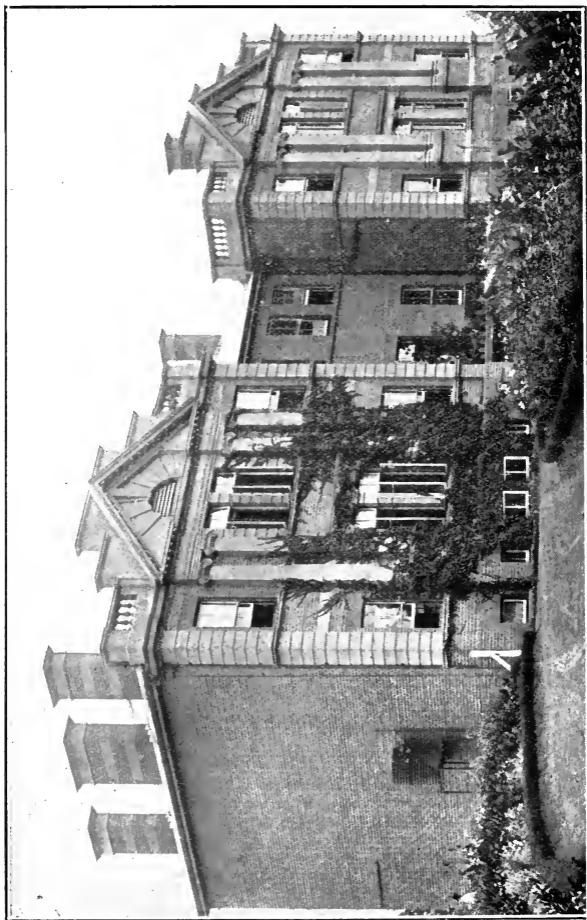
IN the scheme of Horticulture the Climbing Plants should play a very important part, and most of them, if trained properly, can be made most effective. This section may be divided into three groups, each group for a different purpose.

**GROUP I.**—Climbing plants useful for covering bare house sides, walls, and rockwork. These climb by means of tendrils or suckers. In order of merit the list would include *Ampelopsis veitchii* (Virginian Creeper); *Ficus repens* (a climbing fig, with small leaves when young, but throwing large leathery leaves later on the higher branches); and Ivies, which are perhaps only suitable for shady situations in South Africa. The first is always the most popular climber for covering bare house sides quickly, and nothing is better. The only precaution necessary is to keep it from the spouts and top woodwork of the house, and this will mean an annual dressing back to the right limit. If possible, it should be planted near a drain slit, where a little water will percolate through to the roots all the year round.

Both the Ivies and the *Ficus repens* are much better for the walls of outbuildings, especially where these are built roughly. Ivy has a tendency to penetrate into slight cracks in walls, and the growth of the branches in thickness breaks open such cracks further. This is quite sufficient reason for keeping it away from the dwelling house.

When planting, a good-sized hole, say two feet square, should be dug, and after the soil is well pulverized the addition of a pound of bone dust to each hole will do good. Where the soil is poor, or only building rubble, new soil of the same quantity should be put in.

**GROUP II.** consists of those which are strong and rough growers, most of which will make handsome shrubs as well as vigorous climbers to cover old tree stumps, &c. These may be



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used freely in the front line of the shrubbery, or at the edge of a grass lawn, and should be allowed to grow at will. *Beaumontia grandiflora*, *Bignonia regina sabæa*, *Tecoma*, *M'Kenii*, *Bougainvilleas*, *Jasminum sambac*, *J. revolutum*, *Petrea volubilis*, and *Rhynchospermum* are the best of these. They rejoice in a wild freedom in which they are just left alone, and all flower with great freedom under these wild conditions. Plenty of room and plenty of sun are essential.

GROUP III.—The rest of the types are of more slender growth, and require special support, such as trellis, pergolas, arches, and other forms. Of these the most useful are the *Tecomas*. *Bignonia venusta*, *B. tweediana*, *B. speciosa*, *Cobæa*, *Honeysuckles*, *Jasminum streptopus*, *Phaseolus*, *Physianthus* (*Schubertia*), *Solanums*, *Stephanotis*, *Tacsonias*, and *Wistarias*.

The supports for these may be almost of any form or shape. Pergolas and arches are best made of permanent material, old railway metals or tubular iron, and strong enough to stand the downward or sideways strain of the plant when fully grown. Supported wire netting is sometimes used, but it is not at all suitable. If one needs to thin the plants, or prune, or cut out for any reason, it is almost impossible to do this on netting without destroying both plant and support. The run of wires should not be closer than one foot, and should be placed with as few cross-ties as possible.

For quick growing temporary work a blue-flowered *Solanum*, *Cobæa*, *Grenadilla*, *Senecio* or *Tacsonia* may be trained around a tall tripod of rough posts.

SPECIAL TYPES.—*Hoyas* and *Clitorias* are comparatively small twiners and require shady positions and a dwarf trellis, say of locked Bamboos, or they will twine beautifully in balloon shape on wires.

A few special climbers are so slender in growth that they should not be grown alone. These include the magnificent hybrid *Clematis* and *Mandevillea*. With these the proportion of foliage to the length of stem is so small that, grown alone, they look too bare. We, therefore, prefer always to plant them along with stronger types, and allow them to mix up with these in growth. Thus grown they eventually peep out with most delicious and surprising beauty from amongst a mass of greenery, and are infinitely healthier than when exposed to full sunlight.

Another class is finely used when trained in special forms, balloons, spirals, pillars, or umbrella-shaped. The best plants for this purpose are such as have long branchless stems, with flowers at the nodes; or which throw very short but numerous lateral branches. Some of the best are *Hoya carnosa*, *Manettia bicolor*, *Antigonon leptopus*, *Clitoria ternatea*, Japanese honeysuckle, *Physianthus*, *Stephanotis*, and Golden Vine.



*Cupressus sempervirens pyramidalis.*

## CHAPTER XVI.

## LIST OF CLIMBING, TRAILING, AND TWINING PLANTS.

Hardy varieties are marked with \*.

- \**Ampelopsis*—The old-fashioned *A. quinquefolia*, with divided leaf and straggling habit has now given way to the true *clinging* types, *A. veitchii*, and sub-varieties, *A. v. purpurea*, *A. v. robusta*, all first-class, quick plants for quickly covering bare brick or stone work. These are very ornamental and neat, and most beautiful in Autumn when the leaves shade to brown and red.
- \**Antigonon leptopus*—A quick-growing twiner, needing support. Leaves are heart-shaped, the young ones delightfully tinted, and flowers are fine trusses of true pink. Intensely beautiful. Flowers in February and March. Fairly hardy. 10 feet.
- Aristolochia elegans* (Dutchman's Pipe)—A very brilliant perennial climber for the warmer districts. Heart-shaped leaves. Flowers purplish crimson, spotted yellow.
- Aristolochia gigas*—A rampant grower, with large leaves. Flowers purple, very large, with a long tail.
- Asparagus plumosus* (Native)—Extremely graceful, and also useful for bouquet work. The plants are best grown among other creepers.
- Beaumontia grandiflora*—A most vigorous grower, is almost confined to sub-tropical districts, but may be said to stand 5° to 6° of frost without much damage. Where it succeeds it will climb to the tops of tall trees, or may be grown prostrate on banks or rough walls. Very large pure white, lily-like flowers.
- \**Bignonias and Tecomas* are somewhat confused in nomenclature. Of all climbers these are the most useful and hardy, with great vigour and much diversity of colour in the flowers. Of the vigorous types needing plenty of room, we may mention *B. radicans*, with dull crimson flowers; *B. venusta* (Golden Shower), with great clusters of orange flowers, very freely produced (tender to 10° of frost); *B. tweediana*, rich yellow, with climbing tendrils; *B. speciosa*, a fine showy variety, with large mauve or lilac flowers; *T. australis*,

flower milk-white, borne in large clusters in Winter; *T. capensis*, clusters of rich orange red; and *T. McKenli*, rose pink. *T. jasminoides*, a delightfully delicate flower, with red or pink throat, is best on trellis, or perhaps amongst other climbers, as the growth is thin and foliage scanty. *B. regina sabaea* is a magnificent rosy purple variety, indigenous to Rhodesia, a rampant grower, and not yet generally known.

*B. chamberlaini* has a yellow corolla, funnel-shaped. *B. grandiflora* is very vigorous, and bears orange-scarlet flowers in huge terminal panicles. The individual flowers very large. The flowers of *B. magnifica* are mauve, with a light throat, in large panicles. This is very handsome. *B. chrysoleuca* bears yellow flowers with a white limb, in clusters. A good and vigorous kind. Far more use should be made of this family for covering summer houses and pergolas.

*Bougainvilleas* may be allowed to climb almost any height up to 60 feet, or may be kept in almost bush form. For floral effect they should be allowed to grow at random. Colours of the flowers are purple, magenta and crimson or brick red. The last one, *B. braziliensis*, varies in colour with the nature of the soil in which it is planted. *Bougainvilleas* suffer a little with 7° or 8° of frost, but are such quick growers that they speedily recover from its effects.

\**Clematis*—The species *coccinea*, *flammula*, and *montana* are very vigorous climbers and produce masses of very sweet flowers in late Spring. On the other hand, the newer hybrids of the large-flowered kinds are slender and somewhat scanty in foliage, and we prefer to see them peeping out from the midst of other plants with more vigorous foliage growth, or in close groups. Some of the flowers of these hybrids are intensely beautiful and large. Hardy.

*Clitoria*—*C. ternatea* is a slender climber, with lovely porcelain-blue flowers set off by a horse-shoe mark of white. There is also a white-flowered form. Tropical or sub-tropical, or perhaps only suited to Coast or greenhouse conditions even in South Africa. 6 feet.

\**Coboea scandens*—A very vigorous tendril-climber, quickly covering trellis even from seed, and flowering in a few months. The type flowers are deep purple, bell-shaped. There are two sub-varieties, one with cream flowers, and the other with double purple flowers. Hardy and best treated as an annual. 20 feet.

*Combretum coccineum*—May be used as a drooping shrub. For trellis work will need training. The flowers are rich scarlet and are produced in large flat clusters all along the branches. Sub-tropical.

*Cryptostegia grandiflora*—A strong woody twiner, with numerous funnel-shaped, ruddy-purple flowers. 30 feet.

\**Ficus repens*—This plant is Ivy-like in habit and clings to stone by means of suction tendrils. In the young stage and sometimes for several years, the leaves are small and very numerous, but eventually large leathery leaves are produced. Good for old walls and rocks. There is a variety with variegated leaves, but the green form is preferable.

\**Granadilla* (*Passiflora edulis*)—The common, well-known edible-fruited variety. A rampant grower and good, but subject to attacks of Woolly Aphis if over-shaded. 20 feet.

\**Hedera* (Ivy)—The European Ivy's are more adaptable than is generally thought, but all varieties are best in cool climates, and with a shady, South or South-West aspect. May either be allowed to trail or climb. The best variegated type for South Africa is *H. dentata variegata*, silver and green. *H. rægneriana* has a nice heart-shaped, firm leaf.

\**Honeysuckles* (*Lonicera*)—Apparently quite at home either in the Coast or high veld. Of the common types so far introduced, the one generally grown is probably *L. longiflora*, although generally called *L. fragrantissima*, white changing to gold. Another less common one is *L. periclymenum*, the flowers of which are purplish-red outside and yellow inside. The red Honeysuckle (*L. sempervirens*) is frequently spoiled by bad growth. It is best closely "Ballooned" and kept well pruned, for if allowed to grow at will, the whole base of the plant becomes bare and ugly. *L. flexuosa aurea reticulata* has beautiful golden veined leaves, and is a very slender, rampant trailer. Good on banks or rocks.

*L. henryi*, flowers reddish-bronze, and has bronzy foliage; *L. geraldii* is a vigorous climbing variety, with smooth velvety leaves and brownish-purple flowers—a new tint. All the Honeysuckles are suitable for very cold districts.

*Hoya carnosa*—Is not happy unless in a shady Southern aspect. Leaves large, leathery; flowers in flat heads, very delicate flesh colour, with waxy lustre. 8 feet.

*Ivy*—See *Hedera*.

\**Jasminum* (Jasmines)—Most of the varieties of Jasmine are good either as climbers or as drooping shrubs. Of this class we may mention *J. primulinum*, with numerous primrose-yellow flowers; *J. nudiflorum*, deeper yellow; *J. revolutum*, yellow, star-like; and the fine native variety, *J. streptopus*, which is a snow white mass of white stars in December and January. *J. gracillimum* bears single, pure white flowers almost all the year round. All the types are quite hardy and very adaptable.

*Lonicera*—See Honeysuckle.

*Manettia bicolor*—Tender climber, with innumerable tubular, brilliant scarlet flowers, borne all the season. Extra good. 10 feet.



**Solanum wendlandii.**

\**Mandevilla saueolens*—A very slender climber, with magnificent cluster of snow-white, highly-scented, trumpet-shaped flowers, produced at mid-Summer. These slender climbers, including the large-flowered Clematis hybrids, are best amongst other more vigorous climbers, the stems being ugly and bare even when the plant is really at its best.

\**Passiflora coerulea*—Has become a weed in some districts of Natal, and suckers freely from the root-runners. It is a beautiful species, however, most suitable for a wild garden. The colour of the flowers is a pale blue, but fading to almost white in the sun.

*P. quadrangularis*, sometimes called Granadilla, or Giant Granadilla, is worth growing for its flowers as well as for its edible fruits. Colour, violet, white and red. The *Passiflora* family is a very numerous one, and closely allied to *Tacsonias*.

For the colder districts the common granadilla (*P. edulis*) and the very handsome and free flowering *P. coccinea* are best. Good trellis plants.

\**Petrea volubilis* (Purple Wreath)—An extremely handsome, vigorous twiner, covered in late Spring and Summer with long racemes of bluish-purple flowers. A magnificent picture when in full bloom. Will climb to 20 feet.

\**Phascolus caracalla* (Shell Bean)—Closely related to our common Scarlet-runner Bean, but perennial. The flowers are curiously shaded purple and yellow, with a spiral twist, and are borne in large racemes. Some of the annual climbing beans are well worth growing for floral effect, particularly *P. incurvus*, the Japanese Sword Bean, which has both a white and pink flower.

*Physianthus schubertii*—A quick-growing cream flowered twiner, with milky sap. Sweetly scented. In *P. albens* the flowers are tinted red, and somewhat smaller.

*Porana paniculata*—A magnificent and vigorous climber with large spikes of white flowers. It is, however, winter flowering, and, although growing well in some inland cool districts, it will not flower there. Suitable to the Coast, and perhaps some inland thorn valleys.

\**Rhychospermum jasminoides*—A vigorous and large, woody twiner, with shiny small green leaves. From October to January covered with innumerable star-like, pure white flowers, which are very sweetly scented. Hardy. There is a form with variegated leaves, which, however, is not attractive.

*Schubertia*—See *Physianthus albens*.

*Senecio macroglossus*, *S. deltoideus*, and *S. tamoides*—The commonly called "Cape Ivies," indigenous to South Africa and common in the Natal forests. Masses of yellow flowers, but the tint is not pleasing. Tall Climbers.

\**Solanum jasminoides*, the common "Potato Creeper," is one of the quickest and most useful twiners for covering trellis. Flowers white, in clusters. Hardy. In *S. seaforthianum*\* the flowers are deep lilac. *S. wendlandii*, Blue "Potato Creeper," has huge and very beautiful trusses of lilac-blue flowers. This is not hardy and will not stand more than + of frost.

*Stephanotis floribunda*—A magnificent climber, with pure white Jasmine-like flowers, in large clusters. Very sweetly scented.

\**Stigmaphyllon ciliatum* (Golden Vine)—A slender climber with delicately coloured, heart-shaped leaves, and golden-yellow flowers, almost like some orchids in shape.

*Tacsonias*—These are closely allied to the Passion Flowers, and most of the flowers are of similar shape. They are rather slender stemmed plants, with exceedingly long, twining growth. The flowers are magnificent shades of red, scarlet, crimson, and large. Of the species so far introduced, the best are *T. van volxemi*, scarlet; *T. ignea*, fiery red; and *T. mollissima*, pink. All are suited only for warm districts.

*T. exoniensis* is a very fast and vigorous climber, sometimes difficult to keep within bounds. Free flowering, and the flowers are a brilliant pink. A gem.

*Thunbergia*—The perennial *Thunbergias* are all rather delicate, and should not be planted where there is frost unless they can be protected during Winter. Perhaps the best of them is *T. harrisii*, with large, well opened lilac flowers, not unlike a *Gloxinia* in shape. *T. grandiflora* is slightly paler in colour, and its sub-variety *alba* is pure white. *T. coccinea* has smaller flowers of an intense crimson, but these are far more numerous.

\**Vitis henryana*—A Chinese vine, with large much divided leaves, with silvery white ribs and a crimson underside. *V. Thomsonii* is another new species, with leaves of five leaflets and an under surface of claret. Crimson in Autumn. These are well worth growing for foliage effect.

\**Wistaria sinensis*—Deciduous twiners, with a strong, woody stem. Flowers appear before the leaves, and are long racemes of deep lavender, intensely beautiful. Quite hardy. Sub-varieties of this have white, double white, double blue, and lilac-rose flowers, but none of these are quite so splendid as the type. *Wistaria frutescens*, the American type, is also worth garden room. It flowers later than the *W. sinensis*, and has 6 inch racemes of rich purple flowers.

The List of Climbers might be added to extensively, but the above selection will be sufficient for all ordinary purposes.



CHAPTER XVII.

SELECTIONS OF TREES, SHRUBS, ETC., FOR SPECIAL DISTRICTS, POSITIONS, AND PURPOSES.

THE following selections will be found useful by those who are not familiar with a large range of shrubs, and who yet desire to make a judicious selection. Where no varieties are named practically the whole genus is hardy :

TREES AND SHRUBS suitable for moist ground and waterside :

Alnus, Callistemon, Casuarina, Ceanothus, Cestrum, Harpephyllum, Hydrangea, Hypericum, Kerria, Lilac, Phoenix reclinata, Pandanus, Phormium, Poplars, Rhus, Russelia, Salix, Spirea, Taxodium, Leptospermum, Tamarix, Yucca, Eucalypts, Arundo, Bamboos, Cyperus, Polyurus, Tree Fern (Cyathea), Pinus australis.

TREES AND SHRUBS suitable for dry and very dry districts :

Acacias, Aloysia, Aloes, Bauhinia galpini, Belhambra, Barberries, Brooms, Callitris, Casuarina (verrucosa and robusta), Callistemon, Cupressus arizonica, C. sempervirens, Eucalypts: corynocalyx, paniculata, leucoxyton, polyanthemus, rostrata, and stuartiana, Jasmine, Juniper, Pride of India, Lantana, Nandina, Nerium, Pereskia, Poinciana gillesii, Pomegranate, Schinus molle, Spanish Broom, Tamarix, Veronica, Viburnum, Yucca, Dracæna, Strelitzia regina, Agave, Angophora.

TREES AND SHRUBS suitable for extra cold districts :

Azaleas (deciduous), Abies, Acacia, Baileyana, A. dealbata, Acers, Alnus, Althea, Aucuba, Berberis, Brooms, Buddleia lindleyana, Buxus, Callicarpa, Camellia, Castania, Ceanothus, Cedrus, Cerasus, Cordyline (Dracæna), Coronilla, Cotoneaster, Cratægus, Cryptomeria, Cunninghamia, Cupressus, Cydonia, Duranta, Daphne, Deutzia, Diospyrus, Eleagnus, Escallonia, Eucalyptus (amygdalena, sideroxyton, pauciflora, Gunnii, rostrata, rudis, Stuartiana, viminalis, and tereticornus), Euonymus, Fatsia, Forsythea, Fraxinus, Gardenia, Galphimia, Hickory, Hypericum, Jasmine, Juglans, Juniper Kerria, Pride of India, Leycesteria, Lilac, Liriodendron, Loncera, Malus, Magnolia, Morus, Musændra, Myrtus, Nandina, Oaks (Quercus), Oleander, Peach, Philadelphus, Phormium, Pinus, Platanus, Pomegranate, Poplar, Prunus, Rho-

dodendron, Rhus, Raphiolepis, Roses, Robinia, Salisburea, Salix, Sambucus, Schinus molle, Spartium junceum, Spiraea, Symphoricarpos, Tamarix, Taxodium, Thuja, Veronica, Viburnum, Ulmus, Yucca.

**CLIMBING PLANTS for very cold districts:**

Ampelopsis, Bignonia radicans, B. tweediana, B. speciosa, Cinnamon Vine, Clematis, Ficus repens, Granadilla, Hedera, Honeysuckle, Humulus, Jasminum, Passiflora coccinea, Petrea, Rynchospermum, Solanum jasminoides, Tecoma australis, Vitis, Wisteria, Roses.

**CLIMBING PLANTS suitable only for tropical and sub-tropical conditions, or where special shelter can be given:**

Clerodendron, Clitoria, Combretum, Hoya, Manettia bi-color, Passiflora quadrangularis, Porana, Solanum wendlandii, Stephanotis, Tacsonia, Thunbergi.

**MIDLANDS.**—The conditions vary so much in what are called the Midlands districts that it is not possible to compile select lists. There are places where tropical conditions are touched despite considerable elevation. In other places the contour of the country may be such that very cold conditions prevail, although the elevation may be comparatively low. Common sense must be exercised in selections of plants for Midlands homes.

**TREES SUITABLE FOR AVENUES:**

(a) **IN COLD DISTRICTS:** *Acer*, *Cedrus deodara*, *Cupressus lusitanica glauca*, *C. arizonica*, *C. sempervirens*, *C. torulosa*, *Eucalyptus rostrata*, *E. maidenii*, *Juniper*, Oaks "\*" *Pinus insignis*, *P. canariensis*, Poplar, *Schinus molle*, *Thuja lobbii*.

(b) **IN FROSTLESS DISTRICTS:** *Araucaria cookii* "\*" *A. excelsa* "\*", Bamboos, *Casuarina equisetifolia*, *Castanospermum australe*, *Eucalyptus saligna*, *Eugenia eucalyptoides*, *Jacaranda*, *Laurus camphora* "\*", *Magnolia grandiflora* "\*", *Tecoma stans*, *Trichillea*.

(c) **IN MIDLANDS:** *Acacia melanoxylon*, *Callitris australis*, *Casuarina Cunninghamii*, *Cedrella toona* "\*", *C. lusitanica*, *C. arizonica*, *C. sempervirens*, *Eucalyptus saligna*, *Jacaranda*, *Juniper*, *Ligustrum sinensis*, Oak (common "\*"), *Pinus insignis*, *Yellowwood*, *Camellia japonica*, *Plane* "\*."

(Those in italics are shade trees, others of more erect growth. Those starred ("\*") require good alluvial soil or deep soil.)

**PLANTS SUITABLE FOR BINDING EMBANKMENTS:**

*Arundo donax*, *Bambusa arundinacea*, *Willows*, *White Poplar*, *Cotoneaster horizontalis*, *Fatsia papyrifera*, *Jasminum primulinum*, *J. sambac*, *Kerria japonica*, *Lantana prostrata*, *Robinia*, *Tecoma capensis*, *Bignonia radicans*, *Phalaris arundinacea*, *Achillea*, *Perennial Asters*, *Bocconia cordata*, *Fragaria indica*, *Mesembryanthemums* (Hottentot Figs), *Salvia uliginosa*, *Saponaria officinalis*, *Mentha*, *Kikuyu Grass* (*Pennisetum longistylum*).

(Those in italics are suitable for large banks, such as walls of reservoirs or railway embankments only. Others are more useful for horticultural work.)

PLANTS SUITABLE FOR PREVENTION OF EROSION, planting in *dongas*, etc.:

Willows, White Poplar, *Arundo donax*, Tamarix, Kikuyu Grass, *Ailanthus glandulosa*, *Clerodendron fargesii*, *Portulacaria afra*, *Jasminum sambac*, *Phormium tenax*, Yuccas, Bamboos, *Agave americana*, *Opuntia* (Spineless).

PLANTS SUITABLE FOR SALINE CONDITIONS:

Acacia, *Ailanthus*, *Althea*, Saltbush, Berberry, Casuarina, *Cynodon*, *Elaeagnus*, Juniper, *Leptospermum*, *Melaleuca*, Ice Plants, *Paspalum*, Phoenix, *Phormium*, Pinus, *Syringa*, Tamarix, *Thuja*, Elm.

SHRUBS, ETC., SUITABLE FOR LARGE ROCKERIES:

*Aloe arborea* and others. *Bauhinia galpini*, *Berberis purpurea*, *B. thunbergii*, *Buddleia lindleyana*, *Buxus*, *Calliandra tweedii*, *Coronilla*, *Cotoneaster rotundifolia*, *C. horizontalis*, *Cuphea eximia*, *Cycas revoluta*, *Cydonia japonica*, *Deutzia gracilis*, *Portulacaria afra*, *Erythrina humeana*, *Excallonia ingrami*, *Euphorbia jacquiniiflora*, *E. grandiflora*, *Gardenia radicans*, Gorse, *Hypericum*, *Iwora*, *Jasminum sambac*, *Jatropha multifida*, *Lantana prostrata*, *Linum trigynum*, Myrtle, *Ochna*, *Pandanus veitchii*, *Phormium*, *Phyllanthus nivosus*, *Plumbago*, *Russellia*, *Spirea collosa*, S. Anthony Waterer, *Streptosolen jamesonii*, *Symphoricarpus*, *Veronica*, *Virburnum tinus*, Yuccas, *Lonicera nitida*.

(Those in italics are for warm places only.)

CLIMBING PLANTS WHICH cling to brick and stone walls:

*Ampelopsis veitchii* and its sub-varieties, *Bignonia Tweediana*, *Ficus repens*, *Hedera* (Ivy).

CLIMBING PLANTS SUITABLE for pergolas, arches, and summer houses:

*Bignonia venusta*, *B. chrysoleuca*, *B. magnifica*, Honeysuckles, *Grenadilla*, *Passiflora coccinea*, *Porana*, *Rynchospermum*, *Tacsonia v. volxemi*, *T. exoniensis*, *Stigmaphyllon*, *Wisteria*, *Clematis flammula*. Annual climbers and *Cobæa scandens* should be planted at the same time as the perennials, to cover the space for the first season, until the perennials get well away.

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