Forestry for Tasmania.

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[Read August 14, 1899.]

Forestry has never received the attention its importance deserves from either our governing or our scientific bodies. I know that occasionally sundry learned Fellows of this Society have alluded to the subject, and also that our Governments for a few short years employed conservators, but except in one report of Mr Perrin I do not know of any attempt to seriously contemplate the subject. Certainly it has never taken its proper place as a matter of policy and public utility.

The policy of past Governments have been confined to a limited attempt to conserve the wealth of our virgin forests. There has been no grasp of what might have been done beyond this. Of the timber industry that could have been built up; of the enormous advantages of conserving the water that falls on the land in the form of rain and dew; of the changes in climate, much of which is certain, though much is problematical, they appear not to have troubled themselves. Even the mild protection of our native forests reached extinguishing point when the importunity of debt and a falling revenue tried the ability of our rulers. The office of Conservator was first curtailed and then abolished.

The return of prosperity and unavoidable enquiry brought to light the disastrous depredations that were taking place in our State forests. The Government have taken a step that will appeal to the sympathy of everyone having the interest of this subject at heart. They have appointed a Crown Lands Bailiff, and in doing so they have been fortunate in selecting from among their officers a man who is eminently fitted by nature and disposition for the position. I refer to Mr Compton Penny.

This evident recognition of the value of our timber wealth leads one to hope that when evidence can be produced to warrant it still further steps will be taken. It leads one to hope that the evidence adduced in other countries will be turned to account by us, and steps will be taken to at least encourage the plantation and growth of trees where they are badly needed.

I cannot hope, at least in this paper, to do more than superficially allude to the general benefits forestry may bring us. It would be completely out of place to go into details. The evidence of benefit is so clear, the experience of observers so conclusive, that what is required is direction to general principles. If general principles are recognised as being of urgent importance the technicalities of procedure will afford no difficulty.

I propose to roughly discuss the subject under its three principal heads:—

Timber production

Water conservation

Influence on climate.

The subject of timber production naturally falls into two sections—economical use of native forests and the planting of new areas. The first, though it has never received the attention it might, is suffering more from indifference than want of knowledge. We all have a pretty fair notion of what should be done. We know the return they should make to the State, and we know what should be done to prevent wanton destruction and reckless cutting. The economical use of our forests can be greatly improved, but I do not propose to waste your time in these details. Forest planting, on the other hand, would be something new to us. Exotic trees have been planted far and wide in Tasmania, and have almost invariably demonstrated their ability to thrive, but they have never been planted, as far as I know, for economical timber production.

Now we must recognise firstly that forests as they grow in a state of nature seldom produce the most economical timber supply. A straight lofty stem with no limbs except near the apex is the ideal timber tree, and this state is only to be attained by judicious planting and tending. With our native trees our forests are so abundant that it is doubtful if it would pay to compete with nature. Several of our fast-growing eucalypts would in the lifetime of an average man grow large enough to produce good timber, nd

under proper treatment a tree would cut with less waste than is the case with unattended forest trees. Our wattles would gain a size that would yield valuable harvests of bark. But other trees, such as our Ironwood, Blackwood, Huon Pine, Leatherwood, Myrtle, etc, are of such very slow growth that it is quite out of the question to consider such a far off posterity that would reap them. However valuable these woods may be, economy would compel them to be rejected in favor of more rapidly growing plants. We can only hope to appeal to the sympathy of the people by suggesting the planting of a class of tree that will yield an almost immediate advantage with a harvest to be gathered at a no very distant date. The timber market clearly indicates the line to pursue. We have in a state of nature abundant heavy, tough, hard, durable material, and also an ample variety of beautiful woods in demand for cabinet and ornamental work; but the timber we want, the timber we have to import, is the soft but fairly strong, light-weighted woods that are so common in the Northern hemisphere. These woods are the production of pines and firs, and cannot be dispensed with without considerable loss and inconvenience. Last year alone we imported £17,459 worth of this class of timber. This, to us, is a very considerable item, and must steadily be on the increase; not only will increasing population increase the demand, but the supply is becoming affected. In North America and Scandinavia, whence the principal supply comes, the forests are rapidly diminishing and prices are hardening. This must soon materially affect every industry where these soft woods are required. In America and Germany this question of the wood supply is occupying the gravest attention. Extensive departments exist, and every means is adopted to forward the economical planting and maintenance of forests. I see in the agricultural returns for 1892 the forest area of Germany was 34,343,743 acres, the annual return from which was about £21,000,000. The annual cost of maintenance was £4,150,000 and gave employment to 583,000 persons. If we are ever to grow our own softwood, an equivalently large industry for us is wilfully allowed to be non-existent, which is negligent, wasteful and impolitic. Private enterprise and the enterprise of our forerunners in this worthy Society have introduced into Tasmania a great variety of deal-bearing trees, and these trees have almost invariably thrived well. You have only to look at the healthy fir trees dotted about the settled districts of the Island, but more especially at the noble collection in our Botanical Gardens to assure yourselves of the suitability of both climate and soil for the culture of fir trees. All fir trees do not yield the best timber, and the best timber trees would not succeed in any situation. Much experience and knowledge would be required. But that knowledge and experience is within our reach, and if economically applied must give satisfactory results. I will not here attempt to specify what species should be grown it would be premature and out of place.

The idea of true forest plantation for Tasmania, that is the formation of areas extending for many hundreds, perhaps thousand acres, is quite of the question. Such a sublime purpose, however to be commended, would not gain practical sympathy. Our efforts should be directed to point out the beneficial results that should accrue from the planting of copses, that is small areas, from a few, to say, one hundred acres. There are innumerable places quite unfit for agriculture, practically useless for pasture, yet eminently suitable for forests, places at the headwaters of creeks that would not only yield a good return for planting and upkeep, but, as I hope to show presently, would be invaluable as water conservors.

It is not economical to plant trees in a desultory manner. Trees must be planted with a knowledge of their requirements. Above all things too much space must not be allotted to each. This is for two purposes; to check the disposition to throw strong laternal branches and thus distorting, or, at least, preventing the development of a straight, tall stem and secondly to maintain an unbroken canopy of foliage through which

the rays of sun cannot penetrate. This latter point is one of vital importance in forestry. To gain the best results the soil must be properly protected against loss of moisture by evaporation, not only for the purpose of conserving the water but also to best permit those processes of decay to take place that rapidly decompose the fallen leaves into humus or vegetable soil. Our Eucalypts and Acacias are peculiarly ill-suited for this very reason to produce the best forest results. The erect or pendant leaves remain edge on to the sun and afford a minimum of shade, consequently in a pretty dense Australian forest the sun still penetrates through to the soil drying it up, and the scanty foliage that does fall is seldom turned to humus at all. Certainly in many parts the soil is further protected by shrubs and herbs, but these are but a sorry recompense for a true canopy. In most parts in old countries it has been found best to intermix rapid growing fir trees with broad-leaved trees that shed their foliage every winter. This in a long series of years yields the best returns, but is hardly suitable for us for two reasons: We have abundance of native woods as useful as the woods produced by these trees; and the excessive time they require to come to maturity—often many generations. We require forests supplying a class of wood for which we have a great demand and that will yield a harvest within the shortest reasonable time. This is only to be attained by cultivating forests of pine trees. Such a forest would probably commence to return wood to the cultivator at 20 years.

From then for the next 40 years or more according to circumstances the forest would yield a constant supply. If, for example, our fathers about the outbreak of the gold diggings in Victoria had consistently planted forest areas with good species we should now not only be supplying our own wants to the extent of nearly £18,000 per annum, but would also be in a position to supply the whole of the much greater demand of Australia. There have been two objections raised to the policy of forest plantation in Tasmania. Some think though our climate generally would be favorable that the prolonged droughts might militate against the success. Experience shows this to be quite erroneous. Recently we went through one of the severest tests and the cultivated imported trees, though not always growing in the most suitable situations and never under the most favorable conditions, came well through it, so well that there would evidently be no fear of the severest drought doing real harm to forest plantations. But a much graver danger exists from bush fires and if copses were planted in and about bush land, doubtless the loss from this source would occasionally be great. But it is not in bush lands where there is the greatest demand for forests; they would yield their best results in the more cultivated parts. If a farmer planted a paddock of wheat in close proximity to scrub land he would know quite well the danger he was running from fire. But how many farmers in Tasmania when sowing grain tend to desist from a fear of this danger. Likewise where forests would be most useful interspersed in your widely-cleared and open area, would they be running a great risk of destruction? Hardly more so than a field of grain. But this subject of planting for timber production has all the one great objection. In these days when land is not entailed the cost of production comes out of the pocket of the immediate possessor. But who will reap the benefit? Even if one is pretty sure that this will fall to the lot of one's children the harvest is too remote. Though the care and attention of the young plantation is slight, still it is work without visible return. To calculate that the trees we plant with much care and expense to-day will return practically nothing for twenty years, is quite enough to depress the sympathy of any practical man. But fortunately the growth of forest areas is not productive of timber alone; indeed, the growth of timber may be left on one side as quite a secondary consideration. The principal interest to the people of Tasmania is that forest areas are big conservers of water. The rainfall of Tasmania is not as small as it is often supposed. Our rainfall is somewhere about that of the eastern

counties of England. The trouble with us is that our rainfall is not used economically. We have a fall of rain falling mostly on hardened exposed surfaces, the bulk of it flows immedia ely off into the creeks, down the rivers, to the sea. If we have a very heavy downpour the flow off is so great the creeks swell, and that which would be a blessing and a godsend for months to come, could it be retained, bursts over the banks of our rivers destroying crops, stock, and buildings, rushes away from the land where it would have done good to mingle with the sea where it is not wanted. Then, as usual, the sun comes out, what water has not flown off rapidly becomes evaporated. Little or none soaks into the subsoil. The farmer a few weeks after is raising his voice that his creek has little water for his stock, and less for his crop. No, the principal reform we require on our land is to prevent this prodigal waste of nature's gifts; to naturally so protect the surface from excessive evaporation, and so retain the water in the spongy soil, roots, and detritus that the water which at present is sent into the sea and the air with the quickest possible despatch may be retained and retailed to us in a slow constant supply extending over months. How is it that in Europe, where the rainfall is no greater than with us, they have their brooks and streams carrying almost the same water all the year round, while in Tasmania we have only creeks that are three-parts dry eleven months out of the year? It is simply the difference in the natural reservoirs. There they have their woodlands with dense canopies of foliage through which the sun's rays cannot penetrate, into which the rain pours and is stored up as in a sponge; while here we have our light foliaged trees that give so little shade that the water gets out almost as freely as it gets in.

This is the main plea for forest culture in Tasmania. If small but natural water conserving areas were planted with trees whose foliage was suitable for soil protection, such areas would soon more than pay for themselves by the regulation of the water that would flow out from them. In a little time the advantage would be so apparent that forest planting would be undertaken as a matter of course, without longer requiring the stimulating and direct effort that Government would have to put forward at the outset. This is no imaginary picture, this is the experience that has been dearly purchased by many in the Northern Hemisphere. I could give you masses of instances from the bulletins of the United States, all pointing the same way; loss of water from forest denudation and the necessity of replanting I do not think you would have to go beyond any settled district in Tasmania for proofs. Indeed, I think a study of Mount Wellington an ample object lesson. Time does not permit me to dip into this part of the subject, as it deserves, more especially as I wish to refer to the influence of forests on climate. I am aware that the larger aspect of this does not come within our scope of practical enquiry. That forest protection and cultivation will have to come about for lesser reasons, and the larger result will be a fortunate corollary. The immediate plantation of huge forests for the purpose of modifying our climate would be rather Utopian, But we may be allowed to think of it. Within the scope of influence on climate are included two sets of phenomena, the general and the local. General climate is mostly cosmic. That is, the atmospheric dispositions are due to causes in no way referable to the influence on the immediate locality affected. But the question that interests us and has exercised the minds of many both now and in the past is, Are not these atmospheric conditions somewhat modified by the character of the area over which they spread?

The temperature of a forest and its immediate locality is, except in very cold weather, lower than that of open country, also except in damp weather the air in about or above forests carries a greater percentage of moisture. From this it is easily conceivable that condensation with rain will occur over a country pretty well wooded with true forests, while on the other hand expansion with no deposit of moisture will take place over open and therefore hot, dry places. That is to

say though forest lands cannot affect cosmic causes, they are sufficient to turn the balance when conditions of condensation are approached, to cause rain to fall locally where otherwise it would be just missed. This influence on climate theoretically held, has been open to dispute; but careful observations at many stations in Europe are now showing a steady increase of rainfall in proportion as forests are encouraged.

But, however, these more general influences may yet be open to discussion, the immediately local effects of tree planting are undeniable. The farmer knows only too well the dessicating effect of hot dry winds parching up his fields and pastures; he knows as well the effect on his stock, and the conditions of his paddocks, in the heat of summer, and the bleak cold of early spring. Judicious tree-planting has been found in other countries an effectual help in both cases.

Now, in conclusion, I would point out once again what would be the effect to Tasmania had a policy of tree planting been pursued by our forefathers. Firstly, our waters would have been conserved, and instead of periods of drought with no feed and little water, mixed with sudden floods, we should have natural reservoirs of retention, with consistent brooks, instead of empty creeks. Secondly, from the extension the forests would now have assumed instead of having vast evaporating fans, say like the Hamilton district for instance, where the clouds only too often come up from the west, expand into invisibility over head, to be condensed once again when they have passed away to the east, we should have had condensation instead with a fall of moisture, with all its concomitant benefits. And lastly, instead of now importing annually £18,000 worth of soft woods we should not only produce what we require, but be large exporters into the bargain.

Such being the case is it not a wise policy, is it not a duty to posterity, that if the thing can be done without a tax on our labors and resources, that we should do what we regret our ancestors have not done for us? I think there can be no question about it. Only how is it to be done? If a private individual made up his mind to plant a hundred acres with good trees he would find it too great a burden. The work would have to be initiated and partially conducted by the State. The State, up to a point, can produce the young trees without appreciable expense. The State has plenty of land available at New Town, Risdon, and elsewhere for all requirements. We have men already employed in similar work. Our Conservator (Mr Penny), our able manager of our Botanic Gardens (Mr Abbott) and his assistant (Mr Wardeman), who have ample ability for all that would be immediately required, and we have abundance of cheap labor. The young trees being produced in quantity it would remain for the Department to supply them at a low cost to reliable landholders, who would plant them under suitable supervision, And if this principle of State nurseries and supervision were economically carried out the department would be self-supporting, and in a few years the only wonder would be that the foresight of our public men had not adopted such a policy sooner.