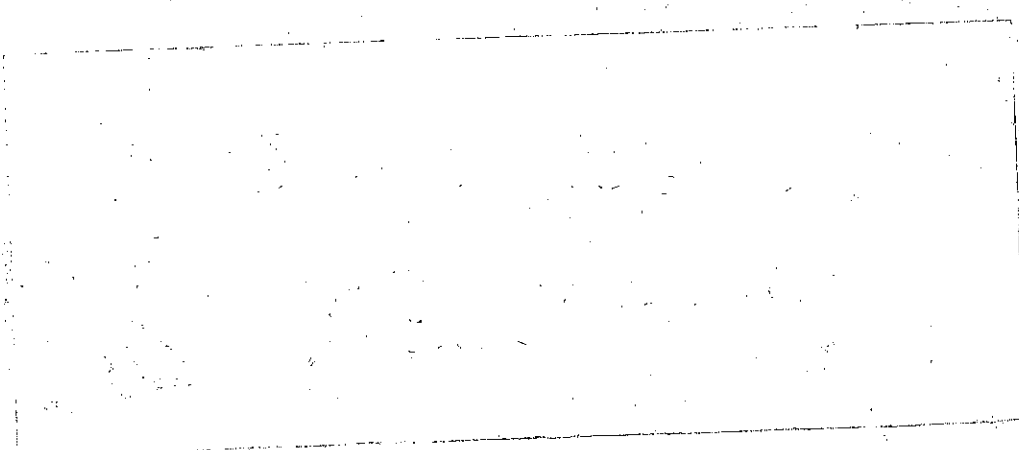


THE
EUCALYPTS OF VICTORIA

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INFLUENCE OF SETTLEMENT ON THE EUCALYPTUS FORESTS.

The influence of settlement upon the Eucalyptus forests has not been confined to the settlements upon lands devoted now to agriculture or pasturage, or by the earlier occupation by a mining population.

It dates from the very day when the first hardy pioneers drove their flocks and herds down the mountains from New South Wales into the rich pastures of Gippsland.

Before this time the gramminivorous marsupials had been so few in comparative number, that they could not materially affect the annual crop of grass which covered the country, and which was more or less burnt off by the aborigines, either accidentally or intentionally, when travelling, or for the purpose of hunting game.

These annual bush fires tended to keep the forests open, and to prevent the open country from being overgrown, for they not only consumed much of the standing or fallen timber, but in a great measure destroyed the seedlings which had sprung up since former conflagrations.

The influence of these bush fires acted, however, in another direction, namely, as a check upon insect life, destroying, among others, those insects which prey upon the Eucalypts.

Granted these premises, it is easy to conclude that any cause which would lessen the force of the annual bush fires, would very materially alter the balance of nature, and thus produce new and unexpected results.

The increasing number of sheep and cattle in Gippsland, and the extended settlement of the district, lessened the annual crop of grass, and it was to the interest of the settlers to lessen and keep within bounds bush fires which might otherwise be very destructive to their improvements.

The results were twofold. Young seedlings had now a chance of life, and a severe check was removed from insect pests. The consequences of these and other co-operating causes may be traced throughout the district, and a few instances will illustrate my meaning.

The valley of the Snowy River, when the early settlers came down from Maneroo to occupy it, as for instance, from Willis downwards to Mountain Creek, was very open and free from forests. At Turnback and the Black Mountain, the mountains on the western side of the river were, in many parts, clothed with grass, and with but a few large scattered trees of *E. hemiphloia*.

The immediate valley was a series of grassy alluvial flats, through which the river meandered. After some years of occupation, whole tracts of country became covered with forests of young saplings of *E. hemiphloia*, *pauciflora*, *viminalis*, *amygdalina*, and *stellulata*, and at the present time these have so much increased, and grown so much, that it is difficult to ride over parts which one can see by the few scattered old giants were at one time open grassy country.

Within the last twenty-five years many parts of the Tambo valley, from Ensay up to Tongio, have likewise become overgrown by a young forest, principally of *E. hemiphloia* and *macrorhyncha*, which extend up the mountains on either side of the valley. This dates especially from the time when the country was fenced into large sheep paddocks, when it became very important that bush fires should be prevented as a source of danger to the fences, and even when fire occurred the shortness of the pasturage checked the spread.

Similar observations may be made in the Omeo district, namely, that young forests of various kinds of Eucalypts are growing where a quarter of a century ago the hills were open and park like. In the mountains, from Mount Wellington to Castle Hill, in which the sources of the Avon River take their rise, the increase of the Eucalyptus forests has been very marked. Since the settlement of the country, ranges, which were then only covered by an open forest, are now grown up with saplings of *E. obliqua*, *E. sieberiana*, and others, as well as dense growths of *Acacia discolor*, *A. verniciflua*, and other arborescent shrubs. These mountains were, as a whole, according to accounts given me by surviving aborigines, much more open than they are now.

In the upper valley of the Moroka River, which takes its rise at Mount Wellington, I have noticed that the forests are encroaching very greatly upon such open plains as occur in the valley. I observed one range, upon which stood scattered gigantic trees of *E. sieberiana*, now all dead, while a forest of young trees of the same species, all of the same approximate age, which may probably be twelve years, growing so densely that it would not be easy to force a passage through on horseback. Again, at the Caledonia River, as at the Moroka, the ranges are in many parts quite overgrown with forests not more than twenty years old. The valleys of the Wellington and Macalister Rivers also afford most instructive examples of the manner in which the Eucalyptus forests have increased in the mountains of Gippsland since the country was settled. The forest in these valleys, below 2000ft. above sea level, is principally composed of *Eucalyptus polyanthema*, *E. macrorhyncha*, with occasional examples of *E. melliodora* and *E. stuartiana*; while *E. viminalis* occupies the river banks and moist flats. I noticed here that *E. melliodora* and *E. macrorhyncha* formed dense forests of young trees, apparently not more than twenty-five years old. In some places, moreover, one could see that the original forest had been composed, on the lower,

undulating hills and higher flats of a few very large *E. melliodora*, with scattered trees of *E. polyanthema* and *E. macrorhyncha*. At the present time the two latter have taken possession, almost to the exclusion of *E. melliodora*. In other places *E. polyanthema* or *E. macrorhyncha* predominate; but, on the whole, I think the latter will ultimately triumph over its rivals, unless the hand of man again intervenes.

Such observations may also be made in Western and Southern Gippsland, but, of course, with reference to different species of Eucalypts.

In the great forest of South Gippsland many places can be seen where there are substantially only two existing generations of trees; one of a few very large old trees, the other of very numerous trees which are, probably, not older than 30 to 40 years, and, in most cases, certainly not half that period. The older trees of this second growth do not, I suspect, date further back than the memorable "Black Thursday," when tremendous fires raged over this tract of country. It may also be inferred, from the constant discoveries during the process of clearing of blackfellows' stone tomahawks, that much of this country, now covered by a dense scrub of gum saplings, *Pomaderris apetala*, *Aster argophylla*, and other arborescent shrubs, that the country was at that time mainly an open forest.

I might go on giving many more instances of this growth of the Eucalyptus forests within the last quarter of a century, but those I have given will serve to show how widespread this re-forestation of the country has been since the time when the white man appeared in Gippsland, and dispossessed the aboriginal occupiers, to whom we owe more than is generally surmised for having unintentionally prepared it, by their annual burnings, for our occupation.

The age of the new forests does not, however, depend merely on the general observation that they have sprung up since the settlement of the country in 1840.

I have been enabled to make some direct observations, which show the size of certain trees of known age, and which will serve as comparison for the general growth of the forests.

In 1864 the discovery of auriferous quartz reefs in the Crooked River district, caused a township, which is now called Grant, to be formed on the summit of the mountains, near the sources of Good Luck Creek. In part of the Government reserve, upon which the warden's quarters and police camp stood, and which was cleared of timber, a few young *E. amygdalina* trees grew, and were permitted to remain. One of these was lately kindly measured for me by Mr. W. H. Morgan, M.M.B., who found it to be 56ft. high and 10ft. in girth 3ft. above the ground. This tree is an example of very many others of the same species now growing on the surrounding ranges. At Omeo, in the Government reserve, a number of young *E. viminalis* are

now 60ft. high, which in 1863 were only small saplings under 5ft. in height. On the road from Sale to Port Albert, which was formed somewhere about 1858-59, there are numerous places where *E. viminalis* and *E. muelleriana* and other species are now growing, upon the ditches formed at the sides of the road. Those, for instance, at Lillies Leaf are on an average about 30ft. high.

These instances show how the occupation of Gippsland by the white man has absolutely caused an increased growth of the Eucalyptus forests in places. I venture, indeed, to say with a feeling of certainty, produced by long observation, that, taking Gippsland as a whole, from the Great Dividing Range to the sea, and from the boundary of Westernport to that of New South Wales, that, in spite of the clearings which have been made by selectors and others, and in spite of the destruction of Eucalypts by other means (to which I am about to refer), the forests are now more widely extended and more dense than they were when Angus M'Millan first descended from the Omeo plateau into the low country.

I have spoken just now of the destruction of Eucalypts by other means than the hand of man, for clearing his holdings, and the following are the facts I have gathered concerning the subject:—

About the year 1863-4 I observed that a belt of Red-gums which extended across the plains between Sale, Maffra, and Stratford were beginning to die. Gradually all the trees of this forest, as well as in other localities, perished. At that time my attention was not drawn to the investigation of the cause. Later, however, probably about 1878, I observed the Red-gum forests of the Mitchell River Valley to be dying, just as those at Nuntin and elsewhere had died years before. I then investigated the subject, and found the trees were infested with myriads of the larvæ of some one of the nocturnal Lepidoptera. These devoured the upper and under epidermis of the leaves, thus asphyxiating the tree. Some 75 per cent. of that forest died that year, and subsequently almost all the surviving trees died also. Since then I have observed the same larvæ at work, some of which, when kept until they had passed through their several metamorphoses to the perfected insect, were pronounced by Professor M'Coy to be examples of *Urubra lugens*. Whether this insect has in all cases been the agent in destroying the red-gums I cannot affirm. Probably not wholly, but I am satisfied that the greater part of the Red-gum trees which have died in Gippsland from obscure causes have been killed by its agency.

The inference may be drawn from the above observations of forests having been killed by infesting insects, that each species of Eucalypt, or at any rate each group of allied species, will have attached to it some particular insect which preys upon it rather than upon any other Eucalypt.

If this is so, we ought to find some one tree selected for destruction out of a number of species, and it is the case with the Red-gum, for it falls a victim to *Urubra lugens*, whilst its neighbours the White-gum (*E. viminalis*), the Swamp-gum (*E. gunnii*), and the Yellow-box (*E. melliodora*) are untouched and in vigorous health.*

I feel little doubt that this will explain why it is that in many parts of the country, at all elevations above sea level, certain tracts of dead forest are to be found. Twenty-five years ago I noticed that during the course of three years all the White-gums (*E. viminalis*) in part of the Omeo district died, whilst *E. pauciflora* and *E. stellulata* remained alive.

I have said that in my opinion the increased growth of the *Eucalyptus* forests since the first settlement of Gippsland has been due to the checking of bush fires year by year, and to the increase thereby of the chance of survival of the seedling *Eucalypts*, and to the same cause we may assign the increase of the leaf-eating insects which seem in places to threaten the very existence of the Red-gum.

Bush fires, which swept the country more or less annually, kept down the enormous multiplication of insect life, destroying myriads of grasshoppers and caterpillars, which now devastate parts of the Gippsland district, spoiling the oat crops, and eating the grass down to the ground.

The ravages of the larvae of *Lepidoptera* are at present greatly aided by the sickly state in which many of the Red-gum forests in Gippsland now are. The long-continued use of the country for pasturage, and the trampling of the surface of the ground by stock, has greatly hardened the soil, so that rain which formerly, in what I may call the "normal state" as regards *Eucalypts*, soaked in, now runs off. In the course of successive droughty seasons the soil of such places becomes thoroughly dry and hard, so that the Red-gum is deprived of much moisture which it otherwise would have in reserve. The trees are wanting in vigour, and thus unable to withstand the attacks of insect pests.

The effects produced by man's interference with the balance of nature, by settling new countries, is not only of great scientific interest, but is also of importance in showing us how and why it is that the labours of the graziers and farmers are being carried on year by year under the increasing attacks of insect pests.

The subject is a tempting one, but to pursue it further would be foreign to the subject of these Notes, which is the "*Eucalypts of Gippsland.*"

* I have observed, however, in some localities *E. melliodora* and *E. piperita* have been slightly attacked by *Urubra lugens*.