

of the 140 have as yet expired, and £40,000 has been expended in replanting ('*reboisements*') at the points most threatened, and, I am glad to learn, with the best results. Extensive planting is also being carried on in the Landes, and district of the Gironde. The latest contributions to our forest literature on the subject of the influence of forests on climate is, I think, given in the reports of the Forest Conference held at Simla in October, 1875, in the shape of a translation from a paper by M. J. Clavé, which appeared in the '*Revue des Deux Mondes*,' from which I extract the following:— 'There are four separate actions of Nature through which it may be said that forests influence, in some way or other, the physical condition or climate of a country. 1st. There is a chemical action through the leaves in decomposing the carbonic acid of the air. 2nd. A physical action in retaining moisture in the earth, and in checking the violence of the wind. 3rd. A physiological action in transmitting to the air, through the leaves, a portion of the moisture which the roots draw from the earth. 4th. A mechanical action, through the roots, in retaining in its place the earth, especially on the sides of mountains and hills.' The writer then proceeds to examine each action in detail, and deduces conclusions favourable on the whole. He admits that 'the action and influence of forests on the climate and physical condition of countries is yet but imperfectly understood;' and concludes, 'It seems to have been clearly proved that, whenever countries have been denuded of trees, their climate has been radically changed. Not to quote again the case of France, Asia Minor may be quoted as a country which, in the era when it was covered with forests, was richly cultivated, and supported, easily, a high rate of population, but which at the present day, owing to the destruction of the forests, has become so arid that the crops fail to come to maturity, and thousands of human beings are now perishing from hunger and want.'"

Referring more particularly to this colony, I do not see any good ground for inferring that any damage has as yet taken place from the clearing away of forests, although it has been stated, and may be the case, that the floods in the valley of the Hutt are much more frequent and disastrous since the extensive clearings there. Certainly whatever may be the effect of forest on the actual rainfall, there can be no doubt as to its indiscriminate removal from the sources of springs, ridges, and steep hill-sides being productive of the most disastrous results.

The history of *reboisement* in France, just alluded to, is most instructive on this point, and peculiarly applicable to the circumstances of New Zealand, where the tendency is to clear the hill-sides in order to provide grazing for sheep and cattle. This is exactly what was done in France, with the result that the vegetable soil soon disappeared, and "the evils calling for remedial measures, though varying in the degree of importance attached to them, have been the destruction of the mountains, the covering up of fertile lands in the valleys with sterile detritus, and the inundation of the plains beyond by the superabundant waters." This is exactly what I fear may be the case in New Zealand, if steep hill-sides such as those of the Buller and its tributaries, are cleared of forest. The timber is not of much value on the upper portions, so that we should not conserve it for that; but I would on no account allow it to be cleared, and whatever may be taken out should be on the system known as "selection felling," or removal of individual trees.

It is natural that the inhabitants of such localities, and throughout a densely timbered district like the West Coast, should long for the clearing away of the bush and opening up of the country for pastoral and agricultural purposes in their own immediate interests, and of course a very large proportion of the timbered land will eventually be so cleared and brought under grass or cereal crops. I would only counsel care and consideration in the treatment of such densely wooded areas, and a general supervision and control by a central authority not likely to be led away by local bias, but at the same time not obstructive, nor blind to the real interests of the colony and settlers at large.

I would gladly see all the low-lying forests betwixt the sea and mountains in Westland and in the lower portions of the valleys cleared away, only striving to have the timber utilized, at least to some extent, and not wasted and destroyed; but I should view with very great anxiety any clearing of the hills which form the dividing range or back-bone of the island, and am convinced that it would be followed, sooner or later, by the most disastrous results, both in the shape of deterioration of the climate, dangerous floods and landslips, and drying up of the springs and sources of rivers, which form so marked and important a feature throughout New Zealand, and invite such favourable comparison with the water supply of neighbouring colonies.

Nor would the immediate gain of clearing such mountain tracts and rendering them available for sheep and cattle runs be anything like what is generally supposed, even presuming the time arrived when the timber, such as it is, could be disposed of at prices covering at least the cost of felling, and conveyance to market. The shingly nature of these mountains is well known to all who have visited them, and I am convinced that, in almost every case, a comparatively few years would see the thin coating of vegetable deposit, capable of yielding crops of grass, washed away, and nothing left but bare and arid hill-sides, affording neither sustenance nor shelter for any animal.

I cannot say that anything which I have seen would lead to the conclusion that bad effects from forest clearing have been experienced in New Zealand. The vagaries and dangers of New Zealand rivers date, I imagine, from too far back to attribute any of the difficulties connected with their control and the conservation of their banks to the removal of forest at their sources, which has besides not as yet taken place to any great extent. Be this as it may, we cannot be wise too soon, and nothing struck both Mr. Kirk and myself more forcibly, when on the West Coast, than the devastations which would be likely to ensue to cultivation and villages in the valleys, and to the towns of Hokitika, Greymouth, and Westport, from extensive forest denudation on the head-waters and course of the Hokitika, Grey, and Buller Rivers and their tributaries. The same doubtless holds good generally, and I have, therefore, thought it right to recommend that, as a first step towards a system of reservation, the forest at the head waters of all the rivers in Canterbury be reserved. Mr. Rolleston approved of this suggestion, and I believe the Waste Lands Board have been requested to give it effect.

It will be observed that I do not consider it proved that the presence or absence of forests alone exercises any appreciable influence on the total rainfall of a locality, though there can be no doubt that they do affect the general humidity of the atmosphere, and render the climate more equable. I have gone carefully through the meteorological returns of New Zealand during the past ten years,