

speaking, unknown. The reason is not far to seek: the saw-miller has embarked his capital in plant for working a block of forest; if that is burnt he loses not only a great proportion of the timber on which he purposes to make a profit, but probably all or part of his plant, in the shape of saw-mill, tramway, &c., and therefore will gladly take all the steps in his power to prevent fire, and would probably succeed, if he could find a market for the smaller trees and loppings, which, I think, he will gradually do, especially if the railways will burn firewood whenever possible, a matter with regard to which I am in correspondence with the Chief Engineer, as I believe it to be not only feasible but likely to prove economical to the Railway Department, whilst of the greatest service to us.

The interests of the saw-millers are, I consider, really identical with our own, that is, with those of a State Forest Department; and I think, if their position be properly viewed and dealt with, we shall find it a great boon to have such means at our disposal for utilizing our forest produce to the best advantage, and not being forced, as we have been in great measure in India, to become, more or less, timber merchants, sawyers, and bushmen. It is, I repeat, an undoubted advantage of the system, or want of system, so far as the State is concerned, in the past, that such an industry is in existence and has attained the dimensions and general excellence which characterize it.

A continuance of the present system of waste, burning, and devastation of the forests, must result in their deterioration and eventual disappearance. Viewed from a purely conservancy point of view, it is, of course, suicidal, and even where it is not proposed to retain or reproduce the timber, but make the land available for settlement or pasturage, it is, to say the least of it, open to objections from a financial point of view.

Judging from what I have seen and heard I have no reason to apprehend any objections or obstructions on the part of saw-millers, hand-sawyers, splitters, &c., to any moderate restrictions, conditions, and payments for the use of Government forest when required, provided that such restrictions, conditions, and payments are clearly understood before they enter on a lease or take out a license for working on Government forest, and that no invidious exceptions are made in favour of any class or individuals.

I am, therefore, of opinion that, if treated with judgment and tact, the present system, under which the forests are worked by an independent body of saw-millers, &c., may be by degrees ingrafted on a proper scheme of conservancy and, in the case of the reserves, reproduction; but that, if left uncontrolled, it must result in damage and eventual destruction of the State forest property, without any adequate return.

CLIMATIC CONSIDERATIONS, WITH SPECIAL REFERENCE TO THIS COLONY.

The general influence of forests on climate and rainfall and moisture has been so frequently and fully ventilated during the past few years that it appears only necessary to call attention to the authorities on the subject, and what may be considered the general conclusions arrived at, before referring more particularly to the special conditions and circumstances of New Zealand in this important respect.

Marsh, in his work on *Man and Nature*, published in 1864, says, "One important conclusion, at least, upon the meteorological effects of forests is certain and undisputed: the proposition, namely, that within their own limits, and near their own borders, they maintain a more uniform degree of humidity in the atmosphere than is observed on cleared ground." And again, "It is well established that the protection afforded by forests against the escape of moisture from the soil insures the permanency and regularity of springs, not only within the limits of the woods, but at some distance beyond their borders. As the forests are destroyed, the springs which flowed from the woods, and consequently the greater watercourses fed by them, diminish both in number and volume." Mr. Marsh illustrates his propositions by numerous authentic instances, and concludes that it is necessary to preserve the wood round the sources of watercourses and on ridges.

Marshal Vaillant, M. Mathieu, Hooker, Schleider and Fries, Becquerel, Humboldt, Boussingault, and many others, have all written to the same effect; and recently Dr. Crombie Brown, formerly Government Botanist at the Cape of Good Hope, has been doing good service by publishing a series of works bearing on the subject, entitled "*The Hydrology of South Africa*," "*Reboisement in France*," "*Forests and Moisture*," or, "*Effects of Forests on Humidity of Climate*," &c., which will repay perusal by any one interested in the subject. I may also refer to a paper on the subject by the Rev. W. B. Clarke, M.A., F.R.S., read on the 1st November last before the Royal Society of New South Wales, containing considerable information.

Space forbids the multiplying of authorities, and citing their opinions, and I will only add an extract from my Dunedin paper, as summarizing my view of the question:—

"Much has been written on the subject of the influence of forests on rainfall, springs, or streams of water, and the humidity of the atmosphere generally. I do not think we can consider it proved that their existence or non-existence influences in any appreciable degree the total rainfall of a district, although they probably do cause the clouds to precipitate their moisture in certain localities. [Hof Rath Wex, in a paper on the 'Decrease of Water in Rivers and Springs,' communicated to the Vienna Geographical Society in 1875, states that the decrease of water in the Elbe and Oder has been 17 inches; in the Rhine, 24; Vistula, 26; and Danube, at Orsova, 55 inches—in 50 years.] As to their favourable influence in the case of springs and streams there is little doubt, and many instances could be quoted from Von Humboldt, 'Marsh on Man and Nature,' and other standard works. They not only prevent excessive evaporation, but, by their presence and action, render the flow of water more regular and permanent, thus preventing disastrous floods and torrents during the winter or rainy season, and long droughts in summer. Their removal from mountain-tops and hill-sides cannot but be regarded as an evil, often followed by the most disastrous results. So much has this been found to be the case in France, that they are now engaged in a gigantic work of replanting the slopes of the Alps and Pyrenees, which had been cleared in former years for grazing. Those replantings are to extend over 200,000 English acres, to cost £400,000, and the work is estimated to extend over 140 years, which is considered 'not an unreasonable time to undo the work of twenty centuries.' Only fourteen years