

6. DANGER OF FIRE.

The most common and yet extremely curious objection that is made regarding the setting-aside of forest reserves is that it is quite a useless procedure to establish such, as they are liable to be destroyed by fire; and one cannot help feeling that such destruction, if it took place, would not be a source of lamentation to the objector. Of course, were this fire danger an acute one, even then the necessity for the reserve would remain the same, and that it might some day be destroyed should simply suggest its careful guarding. Further, the same argument could be used against the planting of artificial timber forests, a matter, fire or no fire, of absolute necessity.

In point of fact, however, it is a very difficult matter to burn a virgin forest. Fires occur almost exclusively where timber has been removed and a litter of dead and dry material lies scattered over the ground. The summer of 1907-8 was almost unprecedented for dryness in the North Island. Bush-fires caused by settlers burning the felled trees on their holdings and the fire spreading thence into forest that had been milled, &c., were common, and for miles the air was thick with their smoke. Yet along the railway-line in the Waimarino Forest for some days a fierce fire burnt on both sides of the line and the road under the stimulus of a high wind, right up to the margin of the virgin bush, which notwithstanding was quite undamaged except just at its outside, where a few trees were scorched. Above the forest-line it is not difficult to burn the subalpine scrub,* which should form a part of any climatic reserve; but a fire there could only be the result of unpardonable carelessness or of design. The truth is, that those who speak of fire have usually in their minds cases where partially "milled" bush or damaged forest has been burned. Such cases, I do not deny, are quite common, the fire originating in the dead branches, &c., on the forest-floor.

Another frequent objection is, that it is quite impossible to reserve small areas cut off from a general forest-mass. This is a half-truth at best. Such areas, even if only an acre or two in extent, will remain intact for years, perhaps for quite as long as they would have done had the whole area been preserved. The Town Belt of Dunedin, the Botanical Gardens of Wellington, Dean's Bush near Christchurch, and hundreds of other examples in both the North and the South Islands could be cited. But turn cattle, &c., into such pieces of forest, make wide roads into them, set them on fire occasionally, and of course they will no longer remain intact. On the other hand, even when much damaged, quite small pieces of forest may confidently be expected to improve rather than to dwindle away.

(B.) DEFORESTATION AND ITS CONSEQUENCES.

[By J. P. GROSSMANN, M.A., Director of the School of Commerce, Auckland University College.]

To most people the cutting-down of our native trees and the clearing-away of the bush appeals only because it means the disappearance of beautiful scenery or the loss of valuable timber. Now, while it must be admitted that the destruction of the bush is to be regretted from the point of view of the tourist or the lover of the picturesque, there are many more substantial reasons that render the process of deforestation which the country is undergoing a question of very serious public interest. And, though the scarcity of timber consequent on the reckless destruction of the bush is a matter that certainly requires the attention of Government and people alike, I venture to believe that there are other evils inseparable from deforestation from which the country is already suffering, and which even more urgently demand that some concerted and systematic attempt shall be made to remedy them, before it is too late.

To realise what must be the inevitable consequences of the destruction of our native bush, it is in the first place necessary to consider what are the functions performed by trees in the economy of nature. Professor Schlich, in the most important text-book on forestry in the language, tells us that forests produce the following effects:—

"They reduce extremes of temperature by increasing the humidity of the air, and thus tend to increase the rainfall; they help to regulate the water-supply by insuring the steady feeding of springs, and thus they tend to reduce the volume of floods; they help to prevent landslips and the silting-up of rivers, and they arrest moving sand; they afford shelter to vegetation from strong winds; and, by aiding the generation of oxygen and ozone, they tend to improve the hygienic conditions of life."

From these considerations it is easy to infer the nature and extent of the harm done to a country by the destruction of its indigenous forests. To describe briefly the character of these injuries, I may quote from a distinguished American authority, Professor Trotter:—

"When the forests are cut down, delicate adjustments in the balance of nature are destroyed. The soil is exposed to the disintegrating effects of the atmosphere. In summer it is baked to dryness; in winter it rapidly loses heat by radiation. In colder regions the loosening effects of frost are readily seen in an exposed soil. In a region denuded of trees the supply of springs becomes intermittent, no longer fed from the constant and unfailing reservoirs of the forest-soil. The heavy dash of rains washes away the loose earth, carrying it into the streams, which become turbid torrents. In the spring, when the ground is still hard from frosts, the rainfall and the rapidly melting snow run off the slopes, leaving only a small part to sink into the ground. This immediately swells the brooks and tributaries of a river-basin beyond their carrying-capacity, causing freshets, which tear away the banks and obstruct the

* Certain varieties of beech forest may also be set on fire.