

MOUNTAIN FIRES

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The object of this contribution is not a discussion on the technical aspects of mountain fires and the fighting of those endangering plantations, matters of which experienced foresters have little to learn; it rather aims at presenting for consideration some broader aspects of the subject which seldom receive serious attention. The sum of public interest is reflected in occasional short and highly picturesque contributions to provincial newspapers which interest themselves chiefly in developing the aesthetic qualities of night fires but attend little to the wake of devastation or their underlying meaning. Certainly no blame can be directed to the majority of our community for being unaware of the serious implications behind the question of mountain fires for it is painfully obvious that most people are so far personally detached from them as to obscure any reflection except that of the spectacular. Where drainage work is required in a countryside the necessity is made sufficiently obvious by flooded fields or roads and a remedy is demanded by all, but in the case of mountain burnings there are no such apparent effects to stimulate public indignation. Furthermore, there are no doubt sections who would argue that mountain burnings are beneficial, as serving their own immediate interests. Therefore, it may be propounded that no important public attention is directed to this perennial process of destruction.

In recent years, say for fifteen or twenty years back, mountain fires have been on the increase, and within the last five years the increase has been further accelerated by new sources of fire provided by large-scale turf-cutting operations throughout mountain districts. The high incidence of plantation fires within the last six or seven years is due more to these increases in possible sources of mountain burnings than to the influence of the great extension in the number of plantations and the frequency of dry spring seasons. With regard to this subject, a remark was made some time ago in hyperbole, but, notwithstanding, with some aptitude. It was to the effect that forestry had so far progressed in this country as to be capable of staging forest fires which compare very favourably with the giant conflagrations of the great forest States of North America. The comparison was inspired by the occurrence of a fire in a Tipperary State forest centre which consumed 596 acres of prospering fourteen-years-old plantation in the short space of thirteen hours. It is worth noting that this fire took place in May and was attributed to mountain burnings getting out of hand. The originator of such a fire, and indeed of the majority of recorded fires, is as securely enshrouded in mystery, as if enveloped in the smoke of his own handiwork.

Figures recorded in the Department's forestry reports show that in a period of five years from 1939-1943, 2,482 acres of young plantations were destroyed by fire; in this same period 29,180 acres of plantations were laid down, which shows that it is possible for fire to destroy over a short period an acreage equivalent to about $8\frac{1}{2}\%$ of the area of newly-formed plantations, a seemingly high proportion. Under prevailing conditions and provided with an unlucky run of years there is no real reason to deny the possibility of even more alarming figures. The report also shows that during this five-year period 263 fires, damaging or otherwise, were recorded in the vicinity of forestry plantations and attributed to mountain burnings, picnic parties, smokers, dinner fires on bogs, and so on. Of these causes mountain burning is by far the most important in contributing to the destruction of plantations, and indeed, all else in their way. Such Departmental reports are necessarily concise and do not elaborate, but underlying such figures is the unheralded and arduous work, by night and by day, of foresters and their helpers in defending State forests against destruction.

It is well recognised in mountain districts that these fires are initiated by graziers in order to burn off large furze and wiry heather and other shrubby growth, and to remove the older and coarser molinia grass, all of which tend to suppress the growth of mountain grasses upon which their sheep and other stock feed. In ideal conditions this does happen and various sweet grasses may come up in the spring and early summer along with a softer growth of young molinia grass. Also, young

heather shoots are stimulated and this is often important in districts where snow lies for any length of time in the winter as the sheep can feed on these young shoots when ready access to ground grasses is denied them. However, if these burnings are to be carried out rightly, if they can be carried out rightly, they should be done in the early spring or late summer, or even in winter, when dry vegetational conditions prevail and circumstances are such as to facilitate the control of the fire and its confinement to a definite area. It is not much of an exaggeration to state that controlled burning at such seasons and under such conditions is never practised in this country.

It may be argued that the increase in mountain fires already mentioned is due to a succession of very dry springs over the last decade which often develop into drought periods with continual east winds, but it seems more probable that the number of fires were on the increase long before and that their effects have only been accentuated by these dry periods. It may here be mentioned that during the times of the estates, close control was maintained over large tracts of mountain, principally for the purpose of preserving game amenities; with the passing of the estates this protection has ceased. Such burning as was carried out on preserved hills was usually done in rotation on small patches or strips, at long intervals, and with the principal object of producing young heather shoots for grouse. In other countries, especially in Scotland where hill farming was practised on a large scale, a tenant was always subject to definite regulations governing heather burning and the matter was carefully controlled on a rotational basis in accordance with the size and age of the heather.

When we turn to our own country we find that there is little measure of control nowadays and that fire is put to the mountain without regard for weather or season, and at all hours of the day and night. Fires which have travelled anything up to five miles from their source have often been the cause of serious forest destruction. In this regard it is interesting to note that according to the Game Preservation Act, 1930, all burnings on uncultivated mountains are prohibited between April 1st and July 14th, unless permission be had in writing from the authorities, and that offences are subject to penalties. Yet it is as impossible to believe that the instigators of the weekly hundreds of mountain fires are fortified with written permission as it is to credit spontaneous combustion as their cause. Furthermore, it is well nigh certain that, provided weather conditions remain unaltered, a traveller through mountainous country could not distinguish between the frequency of fires before or after the 1st April.

The advantages of mountain burning to the grazier, particularly when it is uninfluenced by any system or method of control, are of a temporary nature and the practice is short-sighted. In the past when controlled burning was practised extensively on hill grazing farms in Scotland, it was even regarded as "a valuable agricultural operation," and burnings were carried out on a six to eight-year rotation and entailed the strictest control over the season and existing ground conditions of the chosen portion of mountain before it was set alight. Even under these ideal circumstances it is very difficult to believe that the burning followed by grazing did not constitute exploitation of natural resources.

In proceeding to deal with the practice of mountain burning and its effects, it is as well to point out that the type of hillside envisaged here is that more or less usual to most of our mountain ranges, which is, a sandy, shallow soil overlain by a light peat layer, seldom exceeding one foot and more often in the region of three to nine inches if not already rendered shallower by previous burnings. The burning of deep peat bogs or deep soiled drifts or valleys will not be treated here, as they have only an individual rather than a general bearing on the subject and space will not allow.

A grazier may burn his mountain from time to time according to the speed with which the heather, furze, and rank molinia re-occupies the ground after previous burning off, or maybe as often as there is enough vegetation to burn. In this way he may be rewarded for a period of years by a sufficient growth of young grasses and heather palatable to his grazing stock. In the process, however, he is surely removing, in proportion with the frequency and severity of fires, the fertility from which his grazing vegetation arises. In the first place the friable surface humus, often the source of sweeter grasses, is burnt away, and the

growth which contributes vegetable matter to this humus is weakened. This is brought about by burning in drought conditions where vegetation and soil alike are tinder dry and it is possible for the fire to scorch or burn the top layer of peat, thereby rendering it to ash and damaging the roots of the surface plants. There are admittedly certain conditions when this burning could be done with less damaging effect to the surface peat or soil, that is when the vegetation is dry and the ground moist, and such periods would more likely prevail in winter or early spring. Where such moist conditions exist the fire can less easily penetrate to the roots of the shallow rooting vegetation, and this is an important point. Repetition of indiscriminate burning in all cases reduces the energy of the plant growth and a general change and deterioration in the vegetational community occurs, the peat layer becoming gradually hard, shallow and impervious. Usually a mixture of erica, dwarf furze, molinia, and later, on flatter ground, scirpus and sedges, asphodel and lichen replace calluna to some extent, and hylocomium mosses, sweeter grasses and herbs altogether. Furthermore, the vegetation becomes sparse and fails to cover the ground adequately, resulting in surface extremes of wet and dry according to weather conditions. A sort of sub-climax may be reached where the ground cannot be burnt over further, because of the scarcity of vegetation on the sterile peat. Here, unfortunately, there is no reversion to the original type and large tracts of this impoverished ground are painfully evident over big areas of our mountains. Alternatively the remaining peat layer may be burnt away and the soil or rock laid bare. The soil, particularly if it lies on slopes and is of a light or sandy nature, is exposed to the agencies of erosion and is gradually washed downwards and removed. Very often there is little or no soil under the peat and the bare rock is exposed comparatively soon. Again, in the early stages, fire is capable of penetrating into and under the good fresh turf sod, and by burning away for weeks renders all the surface peat to ash. With the aid of wind and water the same climax is again reached, but more rapidly, and the rock laid bare. All these processes described lead but to one end, the total or partial impoverishment of the grazing value of the ground.

In other countries, particularly in the U.S.A., extensive and costly schemes are put into operation in an attempt to arrest the conditions of denudation brought about by indiscriminate bush fires. It would profit us well to examine conditions on our own mountain slopes and see whether similar problems lie in the future for us if restriction is not now applied.

The impoverishment of soil fertility is the principal but not the only loss attributable to mountain fires. Subject to wind and dry conditions such fires may sweep for miles across country, destroying fences and sod ditches as well as turbary and footed and stacked turf.

The game bird population of the mountains is a part, however inaccessible, of our national wealth, yet every nest and egg of game or other birds that comes in the path of these fires is most surely destroyed. Anyone who has attended a mountain fire in spring, more particularly at night, will not readily forget the pathetic agitation of the unfortunate nesting birds. The matter has a dual inimical effect on the increase of the grouse, one of our most valued game birds. Firstly their nests and eggs are so frequently destroyed that it must have an effect on their numbers and their instinct to return to the locality. Secondly, the supply of healthy calluna, an important food for grouse, is greatly diminished by repeated burnings, and its sparseness has a limiting influence on the numbers of these birds.

The effect of burnings is becoming increasingly evident everywhere in our mountains by the appearance of grey arid patches of bare rocks or scree of stones of greater or lesser extent. Where these patches are small and adjacent to one another, one can easily imagine their joining up and merging into one; very frequently no imagination is needed. No person acquainted with our hill ranges can fail to have noticed within a short span of memory the change in certain parts from mercurial purples and browns to the static and unbeautiful grey of rock. The process is evident in the Galtees and the Knockmealdowns, in the Wicklow Mountains, and indeed in nearly every mountain range in the country. Dubliners need travel no further than the Sugar Loaf Mountains to find good evidence of what fire can do. If they look to the western slopes of the Little Sugar Loaf they will see a grey hillside of stones and boulders, where not much more than ten years ago there grew a thicket of vegetation. Turning west to the Big Sugar Loaf they will

see a patchwork of grey stoney ground with the normal dark brown heather ground interwoven, the preliminary stage before the ultimate bareness of its sister mountain. It is true that in this so perfect example the mountain grazier has played little enough part and the destroying fires were mostly the work of careless picnickers and holiday makers, but it is none the less striking and convincing evidence of what fire can do. Perhaps, it is not too much to ask the imagination to foresee a time when most of our mountains will be like this.

Taking the long view, the subject is indeed one to which, without frivolity, the attention of our Irish Tourist Board might be drawn for, though we know the grey escarpment of Burren to be both unique and interesting, a whole country of such hills would be extremely dull.

An enumeration of the destructive effects of fire would be incomplete without due reference to its influence on watersheds and its ramified effects on flooding. In what should be the normal course of events, where a strong and even vegetation occupies the ground, the rain falling on mountains is first of all broken up by the overground umbrella of plants and it is then absorbed, to a great extent, by the loose humus covering the peat or soil. This is particularly obvious with good heather growth which holds great quantities of water in its leaves and branches after a shower of rain. Again, with strong vegetation in natural conditions the surface peat or soil is kept open and in receptive condition, and the water which ultimately finds its way there can percolate slowly downwards. The process is the same in miniature as that which occurs in forest covered areas where it has been well proven that the fall and off-flow of rain water is importantly influenced by the tree cover. And so, the whole off-flow of water after rain is regulated and contained at source, the influence of which extends from the smallest of mountain streams to the mouth of the biggest river.

It has already been shown that, as a result of fire, conditions are reached on mountain sides where vegetation becomes sparse and dwarfed and the surface peat hard and impervious. In such conditions rain falls more or less direct on the ground surface and, with the peat hard, flows away at once and follows gravity downhill in volume, probably to the nearest stream or river. On such hard peat slopes this is very obvious after heavy rain when the water can be seen to flow about as if on oil-cloth. Eventually this volume of water, which is abnormal, has to be received by the streams and rivers. Very often they are inadequate to the task, and their sides and banks are torn away and flooding takes place laterally on to the hill slopes.

More often perhaps the deeply cut mountain streams are able to take these sudden onrushes without serious flooding high up but where the stream gradient eases out to flow into the flattering foothills, flooding of a more serious nature takes place. The shallower and wider rivers of the lowlands cannot contain such sudden spates, silting occurs, the water is no longer restrained and bridges are broken up, roads scored out, houses and yards inundated and fields flooded. In a panorama of hill country, with its lowlands and hundreds of watershed rivers the effects of such onrushes of water must combine to swell and render uncontrollable the ultimate lowland big river, and so to the sea, with effects which are ultimately as widespread as they are harmful. So, perhaps, the effects of mountain fires might after all be less obscure to those living many miles distant from them than was at first suggested in this contribution.

Returning to the forestry aspect of the matter, it should be clear to anyone who admits the extensive destructive effects of these mountain fires that during the passing of the years thousands of acres of mountain slopes, potential forest ground, are gradually being rendered sterile and useless for any purpose. Changes in social and economic conditions may in the future render these mountain sides available on a large scale for planting, by which time they may be so impoverished by fire and erosion as to be useless for forestry or, at best, requiring one or more rotations of forest cover to bring them into profitable tree growing condition.

A great deal of good work has been done in safeguarding our existing forest plantations by fire belts and other means. Economic considerations may have deterred even more efficacious work being done, but it is generally recognised that fires will come from time to time whose rapid progress no available human agency can check or divert. Consequently one must turn to prevention at source as the only real way of combating this danger to our plantations and to the productivity of our

mountains. In what quarter, or by what means can one, therefore, seek a remedy? Like all ills, it is far easier to stress the destructive qualities than to find the constructive cure. Perhaps, the remedy lies in the hands of those authorities responsible for the administration and enforcement of our laws, perhaps more fundamentally with the teachers and instructors throughout the country. Certainly, in respect to the existing laws which govern mountain burnings, it would seem that the authorities are inadequately equipped with powers of limitation. Except for the Forestry Act, which prohibits burning within one mile of a plantation or wood, all other burnings are legal when carried out outside the period 1st April to 14th July. In view of the severe spells of drought which we have experienced in March in recent years, this state of affairs seems extremely weak. Furthermore in the writer's opinion, the existing laws are seldom strictly enforced and are consequently ineffective. If our agricultural authorities were to interest themselves seriously in the matter, much could be done by instruction and possibly by adjustment of the existing laws. Foresters themselves can contribute much by co-operation and otherwise in limiting these destructive practices, but their sphere is limited, and it must rightly lie with other powers to act more effectively whether the brand be raised on a plantation mountain or any other mountain.

During these times we talk a lot, and read more about reconstruction, yet here we have a contemporary and insidious process of national destruction which is allowed yearly to go on its way completely unopposed, and no voice has yet been heard in protest.

The case which has been put is, in brief that mountain burning as practised in this country is destructive in its effects no matter from what aspect it may be regarded, that it is gradually reducing the value of mountain vegetation as a subject for grazing, that it is steadily diminishing the sporting potentialities of grouse moors, that it is annually contributing a volume of water to the flooding of our more fertile lowlands, that is surely detracting from the natural beauty of our mountains, and lastly, that it provides a perennial and avoidable menace to the young forests being built up in the country.

Mountain burnings carried out with co-ordination and co-operation can, to an extent, serve all these interests and not destroy them.

In the nature of things, however, the danger is that the damaging effects of fires may only become evident as a serious problem when they have reached a stage when human efforts towards recovery are of little avail—when, indeed, it will be too late to mend.