

SHEEP AND THE FORESTS.

IN THE FORUM for February, 1901, there appeared an article by Mr. C. S. Newhall on "Sheep and the Forest Reserves," in which sheep are condemned, on several accounts, as an unmitigated nuisance when grazing in forest land. The article in question contains a brief statement of the main arguments which are used in opposing the proposition to allow sheep grazing in forests. The observations of Mr. Newhall were made chiefly in California, and his arguments and conclusions are presumed to be especially applicable to conditions in that State. It has long been apparent to the writer that many of the arguments which are used against sheep grazing do not hold true for all of the forest reserves in different parts of the country, but are, as a rule, applicable to special or local conditions only. I therefore take this occasion of replying to the four principal charges which are brought by Mr. Newhall against sheep, and I shall base my remarks largely on observations made in Montana, Idaho, and Wyoming.

Mr. Newhall arraigns sheep on the ground that they eat and tread the country bare. It is conceded that sheep are not so omnivorous as goats; but it is claimed that they eat all kinds of shrubs and young trees, even including branches of pines, and that the young shrubs which might, if left to themselves, grow up to replace the old trees are totally destroyed by browsing or trampling. The blame for such destruction is laid to the sheep and to the indifference of herders.

For a number of years the writer was engaged in the study of plants poisonous to stock, and he had occasion to observe the feeding-habits of sheep under all conditions. The majority of these observations were made in Montana, including open-range country, ordinary forests not belonging to the reservations, and the Lewis and Clarke Forest Reservation. It may be stated as a general proposition that sheep seldom, if ever, graze in the timber or even under shrubs in any of the forest land of Montana. The writer has repeatedly observed that where sheep are grazing in open parks in woodland, they will not voluntarily enter the timber, even during the customary noonday rest, but prefer to lie down

in the open, exposed to the sun. The difficulties of managing sheep in timber are very great, since a band may easily become separated and many of the sheep lost. Most of the sheep raisers with whom the writer has had conversation on this subject have said that they issue orders to their herders not to allow the sheep to graze in timber areas, on account of their liability to be lost.

In the Lewis and Clarke Forest Reservation the only timber trees on ground accessible to sheep are fir, spruce, pine, and quaking-asp. Any one who has ever seen a band of sheep feeding in mountains will readily understand the almost insuperable difficulties of managing them in rough ground where the whole band cannot be kept in sight; and this explains, in a large degree, the fact that, strictly speaking, sheep are not grazed in timber in Montana.

It is well known that sheep raisers have the habit of driving their bands of sheep after shearing-time to mountain ranges, where they are kept until snowfall. The forests of such ranges are not continuous, but are interrupted by open parks in which there are no trees or shrubs. These parks are usually well covered with grass and other plants which are eaten by sheep. Extended observation shows that under such conditions sheep prefer the various native plants which are usually grouped together by sheep herders under the term "weeds," leaving the tall grass, especially that which is grown in the shade of trees, to be eaten by cattle. The difficulty of raising cattle and sheep on the same range, usually experienced in an acute degree in open range, disappears under the conditions of mountain ranges.

The writer took occasion to ask all the stock raisers he met for their opinion of the forage conditions of the range as compared with those of ten, fifteen, or twenty years ago, and, without exception, he received replies which indicated that the conditions were nowhere worse, and in many instances were distinctly better, than during the days when stock raising was a new industry. The grass does not now grow so tall as it did then, but it stands much thicker on the ground, forms a better sod, and offers far more nutritious forage than when a few long coarse stems were growing instead of the fine matted grass of the present day.

As to Mr. Newhall's contention that the grass is destroyed by the trampling of the sheep's sharp hoof, it may be well to relate a few personal observations made on this point. Near Gray Cliff, Montana, there is a timothy meadow which has been in continuous sod for about twelve years, and upon which a large band of sheep is allowed to run every year in the spring, *i. e.*, during the time when the ground is moist and most cut

up by the trampling. The timothy has maintained itself in good condition, and has not needed a reseeding, such as would have been necessary if the ground had been left without this breaking up. It is not at all difficult to see that the sod of ranges which lie near sheep corrals, sod which is frequently overrun by large bands of sheep, is denser and yields a greater amount of forage than sod in its natural condition on the range. The statement of Mr. Newhall that nothing is left alive on the ground when a band of sheep has passed must be characterized as highly exaggerated. Sheep do not kill native grass by trampling or by eating it. On the contrary, they exert a decided influence in promoting the development of a more closely growing sod. As to the alleged destruction of small brush by sheep, this is certainly not true for Montana, since, as already stated, sheep do not feed in such situations, and therefore cannot trample over small shrubs.

The second charge of Mr. Newhall is that loose ground is dug up by the trampling of sheep and made more susceptible to the eroding action of water, and that by the same action clayey soil is more firmly packed and rendered more impervious to water. The writer has never seen any phenomena of this sort, and it is exceedingly difficult to understand how the trampling of sheep should have such different effects upon the soil under different conditions. As to clay soil in a dry condition, the passing of a band of sheep has no perceptible effect in packing it or digging it up. When, on the contrary, such soil is wet, the hoofs of the sheep sink into it, and thereby cause a retention of the water, which is exactly what seems to be desired. On mountain sides which bear a sufficient quantity of forage to tempt sheep, the ground cannot be stirred up to a sufficient extent by the trampling to cause any noticeable increase in the rapidity of erosion. As already stated, the observations upon which these statements are based are especially true of Montana, Idaho, and Wyoming.

With regard to the charge that sheep are indirectly responsible for forest fires, it is only just to call attention to the fact that one evident means by which fire can sweep through large areas of forest is removed by the eating and trampling down of coarse herbaceous growth, and the consequent formation of a sod with short grass in the open park areas which are found throughout forest regions. It would seem to be in accordance with the accepted notions of fire prevention in forests that the maintenance of such open parks in a condition which offers the minimum of inflammable material should be encouraged in every way. The writer can testify from personal observation in many localities that sheep do

this more effectively than other animals, and that they encroach to the least possible extent upon the neighboring forest areas.

It is, of course, necessary that young trees should be allowed to grow to replace old trees which are dying or being cut; and it is interesting to note and easy to see, by a study of the forest conditions of Montana, that the natural areas of forest growth are not those upon which sheep graze, and that the maintenance of such areas does not in any way limit the extent of sheep grazing. So far as the writer has been able to observe, no sheep raiser in Montana is disposed to complain of any limits to his sheep range set by natural forest areas. As to the charge of Mr. Newhall that sheep raisers and sheep herders deliberately set fire to forest areas for the purpose of burning off trees and allowing the grass to grow, it should be stated that as far as my own observations go this does not apply to Montana.

Mr. Newhall says: "Sheep men are careless with their signal fires; they are careless with their camp fires; they build fires carelessly for protection against wild animals; they start fires purposely in the fall to clear the ground for a better spring growth of feed." The camp outfit of the sheep herder in mountain ranges in Montana includes almost without exception a small sheet-iron stove, and it is a rare occurrence for camp fires to be built under any circumstances. It should also be mentioned that sheep men are much concerned with the prevention of fires in forest areas; since sheep are the most helpless of all creatures in case of fire, and are therefore most apt to be destroyed. In the opinion of the writer, the vast majority of forest fires is due to the carelessness of tourists, hunters, and campers.

While Mr. Newhall concedes that tourists and hunters are exceedingly careless in the matter of camp fires, he nevertheless claims that they may be much more easily watched and controlled than sheep herders. To the writer the exact opposite of this statement appears to be true. It is certainly an easy matter for a forest patrol to locate a herder with a large band of sheep. The movements of the band are necessarily slow, and the trail can easily be followed. Hunters and tourists, however, frequently travel with a small outfit, and usually go in places inaccessible to sheep or in localities where sheep would not be taken. They frequently have no well-planned route, but simply take a course which the exigencies of the country demand. It is a notorious fact that such parties almost invariably build large camp fires around which they may spend their evenings; and the writer has frequently found such old camp fires still smouldering after the party has broken camp.

The further charge is made against sheep that the mountain water supplies are polluted by their presence. While this charge is undoubtedly true, it is equally true of all the domestic animals, and of business enterprises which may be established along the lines of streams. It is, of course, impossible to keep all pollution out of streams without prohibiting all business along their course; and the economic question arises, in this connection, as to whether it is desirable to prohibit the development of an immense industry, such as sheep raising, on the ground that the mountain streams may thereby be somewhat polluted. In the case of almost every city in mountainous countries, it is possible to find abundant water supply in the large springs which take their origin from the mountain sides; and water can be piped from such sources without possibility of pollution. If the water supply is taken from large streams, the necessity of filtration or of other treatment of the water becomes apparent immediately; since the water is necessarily exposed to a thousand sources of pollution which are not connected with the sheep industry.

It is, perhaps, not too much to claim that sheep raising is a legitimate business, which is followed by many men of good education who have the general interests of the country at heart as much as any of their neighbors. The business of sheep raising requires that the owner should build an extensive and costly plant and that it should become a fixture of the locality. It is, therefore, necessary, from a business standpoint, for him to conduct himself in a manner which is consistent with the welfare of his fellow citizens. His business depends as directly and as absolutely as that of any other man upon the maintenance of the water supply and of the forage. The average sheep raiser of Montana and Wyoming understands these conditions thoroughly, and manages his sheep on principles which are calculated to maintain a range in good condition and to improve the conditions wherever this is possible. It seems, therefore, to be a decided injustice to the intelligence of the sheep raisers to accuse them of deliberately attempting to destroy the very conditions upon which their business rests.

In the arguments here presented no attack is intended on the general proposition to reserve the forest areas as far as possible. It is contended, however, that the sheep industry is in itself of sufficient importance to demand recognition. It would be unfortunate if legislation should be adopted which would prevent the further development of sheep raising, or even its maintenance upon the present basis, in a State like Montana, where no evidence has been presented to show that the sheep raisers have abused their privileges, or that the sheep have actually done

any damage upon the forest reservation. In the case of the Lewis and Clarke Reservation there are large areas upon which no trees grow from which lumber could be made. Small, irregular trees suitable only for firewood, growing in comparatively inaccessible places which show no evidence of ever having been forested with good timber trees, can scarcely be considered of more importance to the country at large or to the immediate vicinity than the sheep industry of the particular locality. It is believed that this statement would hold true even if the sheep should actually eat up all the trees on such areas. As already indicated, no injury to these forest areas has been thus far found which could be attributed to sheep grazing. The maintenance of a slow and gradual flow of water from the mountains depends fully as much upon the presence of a good sod containing an abundance of grass roots as upon the presence of trees. It is a fact which can be verified even by the casual observer that some of the steepest mountain slopes are well covered with grass, although unprotected by tree growth.

It is frequently stated that the mountain snow is protected from the direct rays of the sun by evergreen trees, and that it is, therefore, not melted as rapidly as in places not so protected. This statement, however, does not hold true for special conditions. In Montana all snow which falls under trees has usually disappeared by the first of June, and from that time on, during the season when water for irrigation is most needed, the supply comes from snow banks which are formed by the continued driving of snow over rocky cliffs and crags in places where there are no trees to impede the progress of the wind. If the mountain slopes were covered continuously with a thick forest growth, the snow could not be drifted, but would lie uniformly distributed to a depth of from three to five feet, depending upon the location of the mountain range. Under these conditions, all the snow would melt off with great rapidity during the warm weather of May and June, and little water would be left for irrigation. The main source of supply for water during July and August is found, as already indicated, in the snow banks which form at the foot of cliffs to a depth of 75 to 300 or 400 feet. The formation of such deep masses of snow would be impossible in a forest.

It has been charged that weeds and other less desirable plants take the place of the native forage plants when the native plants, including grasses, are grazed upon continuously by sheep. So far, however, as the writer's observations go in Montana, the exact reverse of this is true; and it may be stated as a general proposition for that State that the continued grazing by sheep brings about the gradual extermination of

all weeds except a few which are not regularly eaten by those animals. In fact, this matter has long been recognized by a number of the more prominent sheep men; and several of these have informed me that according to their experience the only plants which had become or could become weeds on the range were those which the sheep would not eat. It is well known that native and introduced grasses endure continued close cropping far better than other plants; and, as a result, the grasses come to occupy the ground as the other plants are gradually exterminated by the sheep. In some localities the writer observed two aggressive plants which were gradually spreading; and, as far as they had extended, they occupied the ground almost completely. These plants were a native species of plantain and chickweed, which were undesirable as forage, and were never eaten by sheep.

It may be found desirable to limit the number of sheep which are allowed to graze in the forest reservations; and from conversation on this subject with a number of sheep raisers the writer has concluded that the majority of these men would be glad to coöperate with the Government in maintaining the forest reservations in their present condition, in preventing fires, in protecting timber in other ways, and in preventing any evil effects of overgrazing. As already indicated, fires in the mountains where sheep are being grazed are of more menace to sheep men than to any other private individuals. The sheep may be caught in the fire and burned, or they may be left without forage by the burning of the dry grasses and weeds. The prevention of fires is, therefore, of immediate interest to the sheep owners. These men desire to graze their sheep in the mountains from year to year, and are therefore anxious to preserve the forage plants in as good condition as possible. So far as observations were made by the writer, no deterioration could be seen in any mountain range where sheep were grazed.

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