

ice, some as large as two or three vessels the size of ours. When the sun began to rise the scene was indeed a magnificent one. Near us was an immense berg and along the top from end to end were perched several successive rows of differently colored sea gulls.

As we neared the coast of Scotland the scenery became really grand. Along the coast were hundreds of fishing boats with their nets set for the tasty red herring so much prized as a food throughout many parts of the British Isles. The coast was so high, in many places, as to be inaccessible, while the waves beat with crushing force upon the rocks. At other places the land sloped down to what appeared to be a sandy beach where the banks of sand could be plainly seen. It was while passing here we obtained an excellent view of John O'Gro's house, at one time the most northerly dwelling in Scotland. A little further down the Eastern coast we passed a lighthouse said to be the one famous as the abode of the heroine Grace Darling. Entering the mouth of the Tyne and passing Shields we dropped anchor at Newcastle, a dingy, smoky looking city, some distance up the river, and thus ended a pleasant and profitable voyage.

J. H. B.

AGRICULTURAL.

The Bare Fallow.

IN the consideration of this subject it is not our intention to treat of the latest and most approved methods of working the bare fallow, but rather to hasten, if possible, the steadily growing conviction that bare fallowing may be advantageously left out of the category of farming operations. This conviction is being induced by the discovery of more economic ways of attaining the objects for which the bare fallow was originally designed, and by the further revelation that some of the apparent accomplishments of the system are only superficial and ultimately of a negative rather than of a positive character.

The chief function of the fallow in English practice, and in fact in the agriculture of most other countries, was formerly to prepare the land for wheat. Its use at present is very similar, but it does not, in this country at least, so invariably precede the wheat crop. The benefits ultimately derived by the land from this preparation are: a thorough cleaning from weeds; an improvement in the mechanical texture; the integration of the mineral constituents of plant food; the formation of nitrates by the oxidation of ammonia and nitric acid brought down by the rain, and the further absorption of ammonia directly from the air. Now as it is our object to repudiate the economy of the bare fallow, we shall assume, and we are not prepared to qualify the assumption in the least, that these favorable results may be obtained without entailing the loss of a season's crop, and the increased labor necessary to a properly worked fallow. Space will not permit of giving the subject more than a superficial treatment, but it is hoped that the suggestions given, and the statement of a few of the facts bearing on the question may induce a more thorough investigation of the principles underlying the proposed remedies for the wasteful and expensive bare fallow.

With regard to cleaning the land, the various methods of treatments which it undergoes in the proper cultivation of the different crops of a rotation will generally prove fatal to the most persistent weeds. The cultivation essential to this year's crop will take place at a season when the slightest disturbance will destroy a great many of the pests. The land next year, under other crops, will receive different treatment which will in turn be unpropitious to the habits of other weeds. Some are checked by the smothering influence of early, quick-growing crops. A great many are prevented from ripening their seeds by being prematurely cut in harvesting the meadow crops. In the same way the plowing system is a fertile means of weed exter-

mination. There may be a few of the intruders which will adapt themselves to any of those conditions, but every properly organized rotation system has its special cleaning crop, the careful management of which will effectually rid the land of all objectionable plant life. Some will object to the hoe crop entirely supplanting the bare fallow on the ground that a fourth or a fifth of the land is more than is needed for these crops. The increased acreage of corn, now grown for ensilage, will help to remove this objection. An excess of hoe crops may be obviated however by following a partial soiling system in which case the cleaning crop would be more varied.

One of the most serious charges that may be made against the bare fallow is that of the loss to the soil it entails by leaching and volatilization. While it is true that some plant food is acquired and a great deal more of that already possessed is rendered soluble, it is also true that these additions and changes take place while the land is under a full crop; but the disadvantage in the former case is, that before this food will be needed for the next crop the greater part of it may have gone down the drains or passed into the air. It would therefore seem that the land should not be without a crop any longer than absolutely necessary. Continual cropping would reduce to a minimum the losses in the ways mentioned, as the plant food would be made use of as fast as it became available.

Nitrification takes place chiefly during the warm summer months, too late to be of much benefit to the cereal crops, which require their nitrogen in the earlier part of their growth. There is, therefore, at the end of summer, usually, an abundance of nitrates in the soil, which being very soluble, are ready to contribute to plant growth if an occasion offers itself, and are equally ready to be washed out of the soil by the fall rains. It would be better then, in order to conserve this nitrogen, to keep the land under a crop during the autumn months. There would be a wide difference between this practice and the bare fallow system, which would require the soil to be void of vegetation not only in the fall but for a year at least, and in the case of spring sown grain much longer.

It is now becoming a frequent practice to sow the land with rye immediately after harvest and pasture this during the fall. It may be plowed under just before winter or in the early spring, or allowed to grow until early summer, when it might be cut for hay or green fodder and the land afterwards sown to rape, which may in turn be pastured by sheep or used as a soiling crop. The economy of this practice as compared with the fallow is seen in the threefold purpose which it serves, viz., preserving the nitrates and other soluble food constituents; checking the growth of weeds, which it certainly does, and supplying an immense amount of food in the form of pasture or otherwise. Of course it will not be expected that under this treatment the land will gain much in fertility. It will however, whether the green crops were pastured or plowed under, have lost virtually nothing by removal and gained something from the air and subsoil, and we are satisfied, that the bare fallow, even after it has received a liberal manuring at the expense of the other fields of the farm, will not be in a better condition in this respect than the field thus treated. We must not be contented however with the fact that our land is not losing in fertility. We should strive to make it more fertile if possible. The possibility lies in the extensive growth of leguminous crops, especially of clover, the virtues of which we spoke at length in a recent issue.

In some cases, on a light sandy soil for instance, it may be difficult to get a "catch" of clover, but even failing in this, it will be useless to resort to the bare fallow, as, there of all soils, containing such a small amount of convertible organic and mineral water, are the least benefited by exposure. In such cases it will generally be possible to get a foundation for the clover crop by liberal applications of farm-yard manure, potash, and superphosphates.

We have only had time to hint at a few of the most important facts relative to the question under consideration. Nothing new has been advanced, the object being merely to draw attention to facts which are very generally known but which do not so generally form