

to obviate this, the feeders or transverse gutters are cut, from the carriage gutter at the top, across all the level gutters to the lowest. By placing stops in the proper places, the water can be conveyed directly from the carrier to any of the catch gutters, without passing on the intervening land, so that the lowest part of the field can be watered first if thought desirable.

Cleaning out of Gutters.—Gutters cut on the old system require to be cleaned out every year just before the watering season, and this for two reasons. First, because they become choked up with rank grass and hinder the free flow of the water in a horizontal direction, which flow is essential to the success of the level or nearly level carriage and level feeding gutters. Secondly, because the sides of the gutters are trampled down by the live stock all through the summer; thereby spoiling the even edge of the gutter, and rendering the distribution of water irregular. In order to put the old gutters into a good state, a man is employed to clean them out and trim them up, at an expense of about 2s. 6d. per acre. The man so employed leaves a heap of refuse about every 20 paces, and these heaps have to be removed before the meadow is laid up for hay. The gutters consequently become wider every year, till at last the width is so inconvenient that they have to be filled up at great expense and relaid. If the system explained in this paper be adopted, it is recommended that fresh gutters should be cut every year: there is no difficulty in doing this, it is only necessary to follow the line indicated by the original ones, cutting one year above and another below the original gutter. The expense of cutting the gutters out afresh is very trifling, about 1s. or at most 2s. per acre; the sods which come out of the new furrow are placed in the old one by its side and trodden in, and thus all the ground is made good. The cutting of new gutters every year has the advantage of entirely preventing the growth of coarse grasses and weeds along the gutters. In very porous or peaty soils the water is apt to sink away rapidly in the main carriages; on such land it is advisable to cut the carriers wider and not so deep. If clay or road scrapings can be procured within an easy distance, I should recommend a thin coating being put along the main carriers. I have known instances of its being done to great advantage.

The Quality of Water.—Before laying out meadows for the purpose of being irrigated there are several important questions which ought to be taken into consideration. A proper supply of water is of course the first and most essential point, and even if this can be had, it must not be taken for granted that all waters will have a beneficial effect when used for the purpose of irrigation. It is found that water flowing from the surface of "wet peaty" or "black moory" soils is positively injurious; water also which contains large quantities of iron is hurtful. But streams in which water cress flourishes, and those

containing mossy stones, are for the most good for irrigation. Water which flows from springs, such as are never found to freeze most invariably well suited for irrigation; fact water from those which are termed "springs" in most cases produces the earl grass. I presume this is owing, in a great measure, to the temperature of the water being higher than ordinary water, and thus keeps the ground warmer. Drainage and ditch water should be conveyed into the meadows if possible. Water, especially after heavy rains, in passing down to the drains, not unfrequently takes along with it some of the manuring substances contained in the soil; if, then, this water is allowed to escape, these manuring matters are away but when it is used for irrigating any meadow below, these valuable ingredients are again deposited, so that what is lost in one field is gained in the other. In mountainous districts where the water which forms bogs at the foot of hills and the head of valleys, may be turned to account. If a deep drain can be run up into subsoil, the bog may be tapped, and some excellent water may generally be drawn off before it has become contaminated by the peat. In the cases in which underground draining fails to yield useful water for irrigation, may be regarded as exceptional.

Time for Watering.—It is a good plan to commence watering the meadows early in the season—not later than the beginning of November. From this period up till February water should, as a general rule, be kept on six days and off three days. This, of course, will partly depend on circumstances, such as supply of water, weather, &c. In frosty weather the water should not be removed from the meadow on which it was at the time the frost set in; it should, if possible be gently moving, and as long as it does so shallower it is the better. If the ground comes covered with a sheet of ice, the water may then be turned off. After February meadows require rather more attention, as the water should be more frequently removed. When the weather gets warmer. Care should be taken not to allow the grass to get a white scum on it, for if this is not prevented, serious injury is done, the grass, instead of improving, grows less. In hot weather the water ought to be changed every day. The land selected for meadow should either be naturally dry, or so by draining. If the latter plan has been resorted to, the drains should be cut deep enough so that the water will soak into them too quickly and the water must not be laid on the same ground as that in which the draining is done. This is practicable, as is the case on farms where meadows are situated below the farm premises; it is a good plan to bring the water from the farm steading, in order to catch any washings from the yards, and thereby to improve the quality of the water used for irrigation. Washings, or liquid manure, are often,