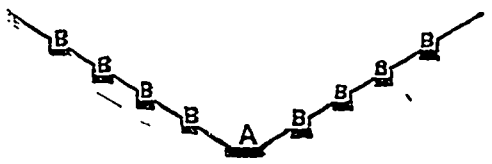
water is let on—it is not the covering, for stagnant water is ruinous to the grass; the fluid must be kept in motion however slow; it is not the deposit of mud, for many of our most pellucid springs, particularly in the chalk country, are most serviceable to the irrigator, though the first runnings after autumn floods are not to be despised, as they, at any rate, tend to deepen the soil about the roots of the plants. And it is curious to see, as I have often seen, how bright and clear the muddy stream becomes after having filtered through the stems of a few acres of grass; you may see the trout two or three feet below the surface of the water when it has returned to the lower level of its bed, whereas, before it has been passed over the meadow, it was as brown and thick as *sewerage*.

Makers of water meadows, *gutterers*, as they call them in Devon, have, as have all *close-corporations*, *secrets*—peculiar ways of judging whether certain streams will be beneficial to the land or not. I never thought much of these secrets, for my part. All streams useful for irrigation have the following characteristics: they feel soft, and so to speak, oily, to the fingers; they don't freeze easily; what fish they contain, especially trout, are of good quality, and the markings or colours of the fish distinct, the spots of the trout bright and numerous, and the trout itself strong and lively on the hook—such a difference between the behaviour as there is, no one but a real fisherman would believe! One unerring sign there is: the growth of water-cress. Though this plant is seldom found in a wild state—the real sort never, I believe—a few might be sown and transplanted early in spring into the side of the stream sought to be utilised for irrigation, and they would soon show whether the water was good for our purpose or not. Brown water, full of tannin from running through peats-bogs, is emphatically *not* good.



Catch-meadow.

Where the system is much studied, as in Devon, they say that the warmth of a spring is a great test of its goodness. There is a plentiful spring by the roadside, between Chambly and St John's, which I have often seen on a frosty morning steaming away like a cauldron, and it is wonderful to see how far down the stream the open water remains unaffected by the frost. This, according to the *gutterers*, should be a first-rate irrigating brook. Anyhow, it is notorious in the West of England that of two springs, one hot and the other cold, the former should be chosen. I only wish we had a Devonshire man here to start the system: it is sad to see so many fine brooks running past so many fine meadows without doing them any good.

And so, though gropingly, we arrive at these conclusions: water acts upon the meadows by warmth; if the stream contains mud or fine soil its action is stronger; if the drainings of towns or yards are present it is stronger still. On the other hand: if the fish in it are coarse; if tannin is present in large quantities; and, I may add, if it is *hard*; the water is, probably, inferior, and experiments on a small scale should be made, before embarking on any extended operations.

There are two systems of irrigation pursued in England: bed-work and catch-work. A few words on the former of these, but very few, as the cost of bed work, even if we had the skilled hands to undertake it, is very great. probably not less than $150 an acre. To make a bed work water-meadow, the turf must be pared off, the whole surface laid up in high regular ridges, from thirty to forty feet wide, along whose top the water runs in little gutters, overflowing the sides to the bottom, where other gutters receive it and carry it back to the stream at a lower level. The engraving will give a good idea of the system. The meadows at Audley End, Lord Braybrooke's place in Essex, Eng., are a specimen of the most perfect work of this kind. Formed in 1841, from old pastures, without disturbing the surface except for the purpose of adjusting the levels and cutting the ditches, they have been immensely productive ever since, having been cut for hay twice each year, with the following results:

FIRST CUTTING	WEIGHT OF GRASS PER ACRE	HAY PER ACRE
1843.....	Tons Cwt	Tons Cwt.....
May 1st to 30th.....	12 5.....	3 8 .....
1844		
April 22nd to May 15th	13 0.....	3 11. .....
1845		
May 23rd to June 3rd...	13 17.....	3 13 .....

And the second cut produced about the same, so we may conclude that the two crops yielded from seven to eight tons of hay per acre. See R. A. Society's Journal, vol 6, part II, p. 522. These meadows happening to have been originally laid up in wide, high beds, did not cost any great sum to form; but the Duke of Portland's water-meadows at Clipstone cost £40,000, or £130 per acre! Still, they pay well, returning upwards of £11 per acre clear profit.

Many of the best flooded-meadows date from the time of the monasteries; notably, those at Leeds-Abbey, Kent, the property of an old friend of mine, "now with God," C. Wykeham Martin, M. P.. Despite all the abuse heaped upon the poor monks, they were the great agricultural improvers of their day. Their day though is not ours, and the necessity for these expensive works has been done away with even in England since the introduction of root and early forage crops, which have provided food for the stock at a time when the whole country used to be brown and barren.

Beds.

Here, we must look for a cheaper plan, if we are to utilise our streams for the purposes of irrigation; and it is to the cheap "catch work" system of Devon and the other western counties we must resort, if we would unite cheapness with efficiency. In these lovely counties, which have the valleys without the Alps of Switzerland, abundant streams roll cheerfully in a rapid descent over stones, or among mossy rocks, and the sheltered sides, shelving rapidly upwards, have long since tempted the farmers to lead the water along their sloping face in tiers of channels, each of which receiving the overflow from above, as it begins to gather irregularly, receives it in a level trough to brim over anew, until it reaches the lowest trough, which delivers it back to the river's bed; hence the term "catch-meadow," because each trench catches the water from its neighbour above it. See engraving.

And it will be seen at a glance, that the catch-meadow is as cheap to form as the bed-work-meadow is expensive. I need