

## IRRIGATING THE PLAINS

BY JUDGE J. C. KNAPP, WIS.

The best location for irrigation would be a plane surface, with a slope of an inch or two in thirty feet, because such a tract could be divided by embankments into beds, or compartments of parallel rectangles of the most convenient size, and thus admit of culture by the horse without breaking the borders or banks in only one direction. On such a plat permanent borders might be made so that trees would stand in them, and in vineyards they could be between the rows of the vines, and where the waters of irrigation would do the trees and vines the greatest amount of good. Yet on such a plat, it is not recommended to have any bed contain more than 600 superficial feet; because a greater surface would not be easily kept level, and it would take too much time to fill the same. It is better to fill one bed from another, than to fill the two as one; and it is better to rebuild borders that are broken down in cultivation, than to have the beds too large. The banks of the *acequias*, water-ditches, should never be broken down in cultivation, and their beds may be kept clean and smooth enough for walks when not in use for irrigation. Their banks will always form walks. On such a tract as we are considering, the *acequias* might be located twenty rods apart, and they would fill beds on either side one-half that distance, and as far down the slope as may be desirable. The general idea is that of a plane so bedded that each bed shall have a level surface, and contain about two square rods of land. But as such a plane is seldom found, other plans must be adopted, such as will be fitted to each individual and particular tract, and meets its special formations. In all cases the beds should, if possible, be so formed that each adjoining bed may not be more than two inches above or below its neighbor, where the water is to flow from the one to the other, and all beds should be so formed as to have a surface so nearly level that every portion will be covered with water when any part has two inches standing on its surface. When the water has arisen about two inches over the whole bed, the border must be broken and the water drawn into the next lower bed; and when that has filled, to the next, until all the line of beds are supplied; and the next line is taken in hand.

## THE BEST LAND FOR IRRIGATION

is a sandy loam, such as is found along most of the streams and rivers in the sand formations. Land of so sandy a character as to be liable to drift is nevertheless, excellent land to irrigate with muddy water. Next to this sandy land, is a soil underlaid with gravel and sand, through which the water can readily percolate. But if the soil be two or three feet deep, of a light sandy loam, it will matter but little that the subsoil is inclined to clay. Stiff clay soils do not behave well with irrigation; the water will lie too long on the surface; and it will bake and crack in drying—an evil that cannot well be avoided, though relieved by mulchings and hoeings.

## THE ACEQUIAS AND TANKS ARE NOT WASTE GROUND.

The banks of the large *acequias* can be planted with fruit and other trees; and, as they may form boundaries of plantations, they will constitute the support for tree belts for breaking the violence of the winds which blow with such force on the Plains. The sides of the tanks, especially such as are oblong, can be economized in the same manner. These banks planted with plums, apples, and even peaches, and their tops bent as much as possible over the water, would cover and occupy the space, and their roots would find a full supply of moisture under the bottom of the tanks and *acequias*, and the curculios, in committing their depredations on the young fruit, would, in many instances, fall into the water and be drowned. The leaves and other droppings from the trees would benefit the water by enriching it. The fruit might be gathered either in a boat or on the bottom of the ditch or tank when the water is drawn off.

## TOO MUCH MONEY AND LABOR WILL HAVE BEEN SPENT

on such land to permit the idea of encumbering it with barren or even worthless trees and crops of any kind; and it should be made to produce to the greatest extent possible. Care in looking to the greatest results must be practiced in culture and planting. For that

purpose it is suggested that the tract be surrounded by a compact border of trees, rapid growers, and valuable for timber or fruit, or both, making a perfect windbreak, and also acting as a wall to retain the vapor of the water of irrigation, or to retain a cloud of smoke over the surface made by kindling fires on a cold night, to keep off early or late frosts. A row or two of the mountain evergreens should form part of every such belt.

## THE ORCHARD

should consist only of trees of well-known hardy habits, with good qualities of fruit and productiveness. Where peaches, plums and pears will thrive, they should be introduced; but experiments with trees of uncertain hardiness and quality of fruit should be sparingly used on such land. It is too valuable to be wasted. High culture and winter mulchings are absolutely necessary as a protection to the roots of the trees against the frosts of winter, therefore no under crop can be admitted to the orchard, except such as will bear irrigation, and leave the surface of the ground perfectly level, and such as will grow under drip and shade of the trees. Strawberries might be cultivated while the trees were small; and raspberries and blackberries on all the ground, even after the trees are fully grown, provided they are cultivated in hills, so as to admit the fruit gatherers and the introduction of the winter mulchings, and its removal in the spring. The produce of these small fruits would more than compensate the cultivator for his entire labor of irrigation and culture. His crops would be no detriment to the trees. Currants could be grown beyond the drip of the trees, and some of the native varieties of currants are of great value.

## THE VINEYARD.

There is little doubt that the manner of growing grapes as practiced in all countries where irrigation is practiced is best. The ground being prepared for irrigation by reducing it to a plane, is then marked off in squares 66 inches each way, which gives nine vines on a square rod, 1,440 to the acre. The vines are trimmed so that the soil which may be dug between the vines when drawn around the vines, will bury all the old wood, while standing erect. In that manner they are buried during the winter. In the spring the soil is leveled off, and the borders formed for irrigation. No stakes are used to support the vines, as the old stub is left, has never been bent down, and not being above eighteen inches high, will sustain all the foliage, new growth and fruit. The vineyards of the Rio Grande require irrigation once in ten days from the time the vines bloom until the berries color. Short jointed vines are far preferable to long jointed ones. Vineyards thus treated ripen their fruit to great perfection; the vines are seldom damaged by the frost of winter, and the ground may be manured by burying manure and mulchings when the hillings up are leveled down. During the first two years after the vines are set, bushbeans may be grown between the grape hills, as that crop requires the same amount of water as the grapes.

## TO RAISE WHEAT AND CORN

and other crops reared in the same manner, the ground must be watered before the land is plowed, otherwise it is likely to be too hard. The crop must be planted as fast as plowed. That watering will bring up the seed and produce the point of the third or fourth leaf of the wheat. It then must be watered to make it tiller, or stool. The next watering must be given after the stem has begun to rise, which will carry the wheat to the bloom; and at which time the fourth and last watering is given, and which perfects the grain. Corn is cultivated in much the same manner, except that sometimes the watering given when the plants are in bloom may be omitted.

## THE EFFECTS OF IRRIGATION ON CROPS.

When the tiller of the soil has a supply of water, and proper soil, he can depend with almost absolute certainty upon sure crops. His crops will not suffer from drouths, and in that almost rainless region, never suffer from excess of water. The trees will always be vigorous and thrifty, and perfect their fruits, as they can do nowhere else. The grape-grower on the sandy land with plentiful irrigation, would secure better ripened vines, and have fruit with a more abundant supply of sugar, than can be secured without such culture. The vine, the peach, the apricot,

the plum, the pear and the apple, will be again grown in the same conditions in which they have been perfected in Persia and Palestine, and as they are now growing in California. The wonderful bunches of the grape vines of Eschol, which Caleb and his companions bore on poles on their shoulders, will be reproduced on this "American Desert." The wheat will then also yield its forty, sixty, and a hundred fold.

## SALTS IN THE SOIL.

All have heard or read of the alkali plains. There are more places where alkali effervesces than is commonly supposed, in fact there is scarcely a place in which these salts are not found. Analysis shows that these salts are compounds of soda, potash, lime and magnesia, with sulphuric, nitric, chloric, and carbonic acids. It is well known that, in some of these forms, these salts enter largely into the production of all plants and trees, and it is manifest that these lands must produce large crops and thrifty trees. The valleys through which the surface waters are drained, or in which they may be preserved in pools, are naturally charged with these salts and thus the waters become rich in all plant food; and for this cause we may rest assured that all irrigated lands on these Plains must remain rich in these salts, and must for a long period of time be as productive as in their virgin state. It is not more than two hundred years since the Mexicans planted themselves on the Rio Grande, and those lands which they have cultivated in wheat and corn during that time are yet as rich, and the yields now produced as great as at the beginning. The Pueblo Indians of the same Territory have cultivated their lands for a much larger period, and yet they show no sign of diminished productiveness. There can be no reason given why every portion of the plains, which can be irrigated, will not be equally productive and durable.

## THE FUTURE OF THE PLAINS.

Room only remains to say that the look-out in the future is, that these Plains will, in that future, become the land that shall flow with milk and honey, and become like the garden of the Lord. With irrigation the land will swarm with people; without it this region will pass into the hands and control of wandering herdsmen, with their herds of cattle and sheep. Railroads have already penetrated these Plains, and others are looking in that direction. These call for settlers, and no time should be lost in acquiring knowledge of the art of irrigation. To do a little in that line, has induced, the writing of this and a former paper. The knowledge and practice must make all the Plains yield their increase, and wave with ripening crops, and give homesteads where once was the "American Desert."—*Chicago Journal*.

## Factory Life in England.

We have from England a pleasant account of factory life, which it is refreshing to read in this age of strikes, turnouts and mutual misunderstandings. Mr. John Smedley, the owner of the Lee Mills, Matlock, has published a letter which describes the life in his factory. It employs about 1,000 hands in spinning and manufacturing merino hosiery. The business is an old one, dating from a period long before the commencement of this century. During this time the business has continued in the Smedley family, and there has never been any trouble whatever with the operatives. Work begins in this mill at six o'clock. At 8 o'clock bell rings for breakfast, which is furnished on the premises at a moderate cost. After breakfast the manager takes his stand at a desk, gives out a hymn, reads in the Bible, or some other work of general interest; a short prayer follows; and at 9 o'clock the hands go back to their work refreshed and alert. On five days of the week the operatives work ten hours; on Saturday the mill is closed at 12. The working hours amount in a week to 55½. For Christmas Day and Good Friday, wages are paid in full. Hospitals for the sick are provided; and "care is taken that, as regards the matter of wages, an operative when he is taken ill is not cast aside, as if no bond had ever existed between him and his employers." There has never been a strike since the Smedleys owned the mill. They are rarely tempted to leave; there is no drunkenness; the hands are smart and effective. Mr. Smedley wisely says in his letter: "I believe the present disagreement between employers and employed is the long neglect of consideration for the workers and the want of sympathy and personal knowledge of the want of sympathy with them." These are golden words which all employers would find it pleasant and profitable to consider and to act upon. We shall have no peace until some method is devised of abating the intense and almost unrelenting antagonism of capital and labor.—*Ex.*

## The French Army Strength—Startling Facts.

The tremendous under-current of intrigue and preparation for another deadly struggle which is going on in Europe was never better illustrated than by recent announcement that France now has at her disposal 871,000 soldiers, all ready for service. This statement, which was at first received with the incredulity which is apparently merited, is nevertheless confirmed very authoritatively. The army which was imprisoned in Germany, numbering about 380,000 men, is on a very good footing. Sobered by its long and shameful captivity, it has prepared itself for vengeance. There are also 68,000 reserve troops of really excellent character, and 423,000 Gardes Mobiles, who have seen service," but who can not exactly claim the distinction of being veterans. The men are not to be disputed, however. They really exist as an organized force, and as a force willing and anxious to fight. France intends, within the next two years, to bring her regular strength up to half a million of men; and to thus have two armies, one of veterans and regulars, and the other, five hundred thousand in number also, of militia, at her immediate command. Her artillery is still in bad condition, but great efforts are in progress for its renovation and improvement. Germany has found it necessary to very much improve her own artillery, and will no more than equal France in the vigor of her amelioration of that effective arm of the service. France is still determined on a speedy and terrible vengeance upon Germany, and the wise may not be able to restrain the over-impetuous. If trouble begins at all it will probably occur shortly after the payments are nearly completed, and on some pretext connected with the "occupation." The rumor that the occupying forces will be strengthened is doubtless true, but of itself has no alarming significance. It is a precautionary measure, but is often taken on the strength of a rumor which proves totally without foundation.—*Ex.*

## Shocking Mal-treatment of Poor People in Massachusetts.

Complaints have frequently been made by persons in temporary indigent circumstances that they were afraid to apply at the Cardon Street Home for temporary relief, on the ground that, if they did so measures would be taken by the officials for their removal. It would appear from the following account that these poor people have some good reason for their objection to the Cardon Street home: On the 20th of April Mrs. Ellen Connolly, the wife of a poor fisherman who at present is at sea, being in destitute circumstances, and having a sick child, applied at the Cardon Street Home for shelter for herself and medical aid for her child. She was informed that she could not be provided for at the Home, but would be cared for at the Tewksbury Almshouse, where she was taken.

Shortly after her arrival at the institution, as she alleges, Mrs. Connolly was brought before a Trial Justice on the charge of being idle and disorderly. The woman not knowing, as she expressed it, what it all meant, and being told to plead guilty, she did so, and was sentenced to six months' imprisonment in the Bridgewater Workhouse; but on the day of her trial the child died, and she was allowed the privilege of attending its interment, during which she managed to escape and was arrested in this city on a charge of being an escaped convict. She was locked up in the Tombs, and will be returned to Bridgewater. The woman states that her only crime is her poverty, and that she does not wish to be imprisoned for being poor.—*Boston Post*.

A Boston woman recently tried to commit suicide because her dearest friend's engagement ring was a cluster, and hers only a solitaire.

A New York lady has comforted herself by constructing a bed quilt of 7,251 pieces, and a rural editor says: "It makes one sleepy just to look at it."

An Irishman, just landed, was asked what party he belonged to. "Party, is it?" said he, "I suppose you've got a Government? Thin I'm agin it."

We see a patent "Sparker" noticed. A man who can't do as much sparking as is good for him without the help of machinery, ought to be gobbled up by a widow with nine small children.—*Ex.*